RECENT ADVANCES in ECONOMICS, MANAGEMENT and DEVELOPMENT

Proceedings of the 2014 International Conference on Economics, Management and Development (EMD 2014)

Interlaken, Switzerland
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Plenary Lecture 1

Discrete Lyapunov Controllers for an Actuator in Camless Engines

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Abstract: This paper deals with a hybrid actuator composed by a piezo and a hydraulic part controlled using two cascade Lyapunov controllers for camless engine motor applications. The idea is to use the advantages of both, the high precision of the piezo and the force of the hydraulic part. In fact, piezoelectric actuators (PEAs) are commonly used for precision positionings, despite PEAs present nonlinearities, such as hysteresis, satura- tions, and creep. In the control problem such nonlinearities must be taken into account. In this paper the Preisach dynamic model with the above mentioned nonlinearities is considered together with cascade controllers which are Lyapunov based. The sampled control laws are derived using the well known Backward Euler method. An analysis of the Backward and Forward Euler method is also presented. In particular, the hysteresis effect is considered and a model with a switching function is used also for the controller design. Simulations with real data are shown.

Brief Biography of the Speaker: Paolo Mercorelli received the (Laurea) M.S. degree in Electronic Engineering from the University of Florence, Florence, Italy, in 1992, and the Ph.D. degree in Systems Engineering from the University of Bologna, Bologna, Italy, in 1998. In 1997, he was a Visiting Researcher for one year in the Department of Mechanical and Environmental Engineering, University of California, Santa Barbara, USA. From 1998 to 2001, he was a Postdoctoral Researcher with Asea Brown Boveri, Heidelberg, Germany. From 2002 to 2005, he was a Senior Researcher with the Institute of Automation and Informatics, Wernigerode, Germany, where he was the Leader of the Control Group. From 2005 to 2011, he was an Associate Professor of Process Informatics with Ostfalia University of Applied Sciences, Wolfsburg, Germany. In 2010 he received the call from the German University in Cairo (Egypt) for a Full Professorship (Chair) in Mechatronics which he declined. In 2011 he was a Visiting Professor at Villanova University, Philadelphia, USA. Since 2012 he has been a Full Professor (Chair) of Control and Drive Systems at the Institute of Product and Process Innovation, Leuphana University of Lueneburg, Lueneburg, Germany.
Research interests: His current research interests include mechatronics, automatic control, signal processing, wavelets; sensorless control; Kalman filter, camless control, knock control, lambda control, robotics.

The full paper of this lecture can be found on page 19 of the Proceedings of the 2014 International Conference on Circuits, Systems and Control, as well as in the CD-ROM proceedings.

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Plenary Lecture 2

EMG-Analysis for Intelligent Robotic based Rehabilitation

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Abstract: The establishment of wireless sensor network (WSN) technology in physiotherapy and rehabilitation is a clue for improvement of the thera- peutic process, quality assessment and development of supporting tech- nologies such as robotics. Especially for complex therapeutic interventions such as sensorimotor training, a continuous monitoring during the ther- apy as well as for all sessions would be quite useful. For the usage of robotic support in rehabilitation various input informa- tion about the status of patient and his/her activity status of various muscles have to be detected and evaluated. The critical point for robotic intervention is the response time. Under physiotherapeutic and rehabilita- tion conditions, the robotic device should be able to react differently and in various patterns. A complex analysis procedure of input signals such as EMG is essential to ensure an effective response of the robot. However sensor nodes in a wireless (body) area network have limited resources for calculating and storage processes. A stepwise procedure with distributed analysis tasks is proposed. Electromyogram (EMG) measurements of eight muscles were collected and evaluated in an experimental setting of a sensorimotor training using different types of balance boards. Fast and easy methods for detection of activity and rest states based on time domain analysis using low pass IIR filter und dynamic threshold adaption. These procedures can be done on the sensor nodes themselves or special calculation nodes in the network. More advanced methods in frequency domain or analysis of dynamical system behavior request much more system power in calculation as well as storage. These tasks could be done on the level of mobile devices such as mobile phones or tablet computer. A broad range of resources can be provided by cloud/internet. Such level based organization of analysis and system control can be com- pared with biological systems such as human nervous system.

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Plenary Lecture 3

Atmospheric Boundary Layer Effects on Aerodynamics of NREL Phase VI Windturbine in Parked Condition

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Abstract: In a natural condition, the wind is affected by the groundcover and the type of terrains which impose vertical velocity profile to the wind. This wind profile, which is also called atmospheric boundary layer (ABL), dramatically influences the aerodynamic behaviors and loadings of horizontalaxis wind turbines. However, for the sake of simplicity, many numerical simulations only deal with the uniform wind speed. To consider the effects of the ABL, numerical simulations of the two-bladed NREL Phase VI wind turbines aerodynamicat the parked condition are conducted under both uniform and ABL. The Deaves-Harris (DH)model is applied to the ABL. The wind turbine blades are kept at the six o'clock position and are considered at two different pitch angles. The aerodynamic forces and moments of the uniform the DH model are compared.The results show that the pitch angle at which the HAWT is parked plays an important role on the blade loading. Also it is observed that for the fully separated conditions, the Down-blade and the blade in the uniform wind are under approximately similar aerodynamic loadings, while the Up-blade encounters more aerodynamic loads, which is even noticeable value for this small wind turbine. This in turn means that for an appropriate and exact design, effects of ABL should be considered with more care.

Brief Biography of the Speaker: Dr. Mohammad Moshfeghi works in Multi-phenomena CFD Engineerng Research Center (ERC) Sogang University, Seoul, South Korea. He is also Lecturer in Qazvin Azad University. He has a registered patent: "Split-Blade For Horizontal Axis Wind Turbines" (Inventors: Mohammad Moshfeghi, Nahmkeon Hur).

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Plenary Lecture 4

Laminar and Turbulent Simulations of Several TVD Schemes in Two-Dimensions

Professor Edisson S. G. Maciel
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Abstract: This work, first part of this study, describes five numerical tools to perform perfect gas simulations of the laminar and turbulent viscous flow in two-dimensions. The Van Leer, Harten, Frink, Parikh and Pirzadeh, Liou and Steffen Jr. and Radespiel and Kroll schemes, in their first- and second-order versions, are implemented to accomplish the numerical simulations. The Navier-Stokes equations, on a finite volume context and employing structured spatial discretization, are applied to solve the supersonic flow along a ramp in two-dimensions. Three turbulence models are applied to close the system, namely: Cebeci and Smith, Baldwin and Lomax and Sparlat and Allmaras. On the one hand, the second-order version of the Van Leer, Frink, Parikh and Pirzadeh, Liou and Sreffen Jr., and Radespiel and Kroll schemes is obtained from a "MUSCL" extrapolation procedure, whereas on the other hand, the second order version of the Harten scheme is obtained from the modified flux function approach. The convergence process is accelerated to the steady state condition through a spatially variable time step procedure, which has proved effective gains in terms of computational acceleration (see Maciel). The results have shown that, with the exception of the Harten scheme, all other schemes have yielded the best result in terms of the prediction of the shock angle at the ramp. Moreover, the wall pressure distribution is also better predicted by the Van Leer scheme. This work treats the laminar first- and second-order and the Cebeci and Smith second- order results obtained by the five schemes.

Brief Biography of the Speaker: Professor Edisson Sávio de Góes Maciel was born in Recife, Pernambuco, Brazil in 1969, February, 25. He studied in Pernambuco until obtains his Master degree in Thermal Engineering, in 1996, August. With the desire of study aerospace and aeronautical problems using numerical methods as tools, he obtains his Doctor degree in Aeronautical Engineering, in 2002, December, in ITA and his Post-Doctor degree in Aerospace Engineering, in 2009, July, also in ITA. He is currently Professor at UFGD (Federal University of Great Dourados) – Mato Grosso do Sul – Brasil. He is author in 47 papers in international journals, 2 books, 67 papers in international conference proceedings. His research interestes includes a) Applications of the Euler equations to solve inviscid perfect gas 2D and 3D flows (Structured and unstructured discretizations) b) Applications of the Navier-Stokes equations to solve viscous perfect gas 2D and 3D flows (Structured and unstructured discretizations) c) Applications of the Euler and Navier-Stokes to solve magneto gas dynamics flows 2D and 3D; (Structured and unstructured discretizations) d) Applications of algebraic, one-equation, and two-equations turbulence models to predict turbulent effects in viscous 2D flows (Structured and unstructured discretizations), e) Study of artificial dissipation models to centered schemes

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in 2D and 3D spaces (Structured and unstructures discretizations) f)Applications of the Euler and Navier-Stokes equations to solve reentry flows in the Earth atmosphere and entry flows in Mars atmosphere in 2D and 3D (Structured and unstructured discretizations).

The full paper of this lecture can be found on page 79 of the Proceedings of the 2014 International Conference on Mechanics, Fluid Mechanics, Heat and Mass Transfer, as well as in the CD-ROM proceedings.

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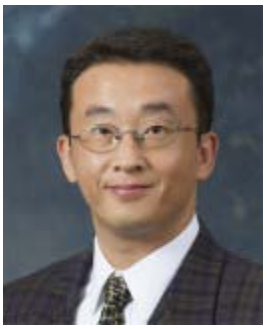
Plenary Lecture 5

The Flocking Based and GPU Accelerated Internet Traffic Classification



Professor Zhiguang Xu
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Abstract: Mainstream attentions have been brought to the issue of Internet traffic classification due to its political, economic, and legal impacts on appropriate use, pricing, and management of the Internet. Nowadays, both the research and operational communities prefer to classify network traffic through approaches that are based on the statistics of traffic flow features due to their high accuracy and improved robustness. However, these approaches are faced with two main challenges: identify key flow features that capture fundamental characteristics of different types of traffic in an unsupervised way; and complete the task of traffic classification with acceptable time and space costs. In this paper, we address these challenges using a biologically inspired computational model that imitates the flocking behavior of social animals (e.g. birds) and implement it in the form of parallel programs on the Graphics Processing Unit (GPU) based platform of CUDA from NVIDIA™. The experimental results demonstrate that our flocking model accelerated by GPU can not only effectively select and prioritize key flow features to classify both well-known and unseen network traffic into different categories, but also get the job done significantly faster than its traditional CPU-based counterparts due to the high magnitude of parallelism that it exhibits.

Brief Biography of the Speaker: Prof. Zhiguang Xu received his Ph.D. in Computer Science from University of Central Florida, FL, USA in 2001. He is currently Professor of Computer Science in the Department of Math and Computer Science at Valdosta State University, GA, USA. His research and teaching interests include Computer Networking, Artificial Intelligence, Parallel and Distributed Computing, and Computer Science Education. Professor Xu is author or co-author of more than 25 published papers in refereed journals or conference proceedings. He has been awarded many grants from both academic and industrial entities. He is actively serving as committee member, reviewer, or lecturer of many national and international conferences and organizations.

The full paper of this lecture can be found on page 88 of the Proceedings of the 2014 International Conference on Mathematical Methods, Mathematical Models and Simulation in Science and Engineering, as well as in the CD-ROM proceedings.

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Plenary Lecture 6

The State of Civil Political Culture among Youth: Goals and Results of Education

Professor Irina Dolinina
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Abstract: Political culture is viewed as a phenomenon of social reality. Attitudes toward it (its meaning or significance) are historically conditioned. This research studies enduring presuppositions about (dispositions toward) society and the state, and how these are reflected in conscious stereotypes and cognitive structures among young people within the sociocultural mechanisms that form and modify the basic characteristics of political culture.

Brief Biography of the Speaker: Prof. Irina Dolinina was born in 1960, in Perm, Russia. She is Team Leader in the Research Project «Formation of the political culture of the students», and Professor of Philosophy and Law of the Faculty of Humanities, Perm National Research Technical University since 2012. She has received a lot of honors and awards (2012 - Diploma of the All-Russian Roswitha fund national education and the Education Committee of the State Duma of the Federal Assembly of the Russian Federation. 2013 - Diploma of the All-Russian Roswitha fund national education and the Education Committee of the State Duma of the Federal Assembly of the Russian Federation. Diploma-Russian contest "Best Science Book in the humanitarian sphere - 2013). Prof. Dolinina has various progessional organizations and activities.
(Expert on the legislative activities of the Council of Federation of Russia. Board member of the Interregional Association "For civic education." Director of the Research Centre of the political culture).

The full paper of this lecture can be found on page 57 of the Proceedings of the 2014 International Conference on Educational Technologies and Education, as well as in the CD-ROM proceedings.

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Shortening of the assembly time for small hydro power plants

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***Abstract*—** The vast majority of the best locations for building big hydro power plants, especially in Europe, have been utilized in the previous century. Also the environmental policy of European countries has become stricter. These facts, together with the financial burden of mega projects in hydro power business made an investments into small and micro hydro power plants a viable option. Since each day a power plant is not running produces a noticeable loss in the power output which consequently results into a financial loss, each action, that can make a power plant feed the electricity into the grid sooner is highly valued. To ensure a faster assembly time a series of work sheets have been developed, these shall make the turbine assembly faster, downtimes shorter and the whole process more efficient.

***Keywords* —** assembly time, efficiency, hydro power, hydro power plant, small hydro.

I. INTRODUCTION

HYDROELECTRIC power provides almost one-fifth of the world's electricity. Hydropower is also the cheapest way to generate electricity today. That is because once a dam has been built and the equipment installed, the energy source - flowing water - is free. It is also a clean fuel source that is renewable yearly by snow and rainfall [1]. In EU hydro power was the biggest source of renewable energy in 2011 with a share of 46 %, followed by wind power (26.5 %) and biomass (19.7 %) [2].

The Renewables Directive creates an overall target of 20% renewables across EU in all energy sectors by 2020; it takes a broader approach by integrating the power sector, transport, and heating and cooling [3].

Texas Renewable Energy Industries Association (TREIA) defines the renewable energy as "any energy resource that is naturally regenerated over a short time scale and derived directly from the sun (such as thermal, photochemical, and photoelectric), indirectly from the sun (such as wind, hydropower, and photosynthetic energy stored in biomass), or from other natural movements and mechanisms of the environment (such as geothermal and tidal energy). Renewable energy does not include energy resources derived from fossil fuels, waste products from fossil sources, or waste products from inorganic sources." [4]

Environmental protection agency (EPA) defines renewable energy as "electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project" [5]

The biggest contributor to the renewable electrical energy production is hydropower, followed by wind power and biomass.

Hydropower is based on a simple principle process: taking advantage of the kinetic energy and pressure freed by falling water of rivers, canals, streams and water networks. The rushing water drives a turbine, which converts the water's pressure and motion into mechanical energy, converted into electricity by a generator. [6]

II. CURRENT RENEWABLE ENERGY SITUATION IN THE WORLD

Global wind power installed capacity at the end of the year 2000 was only 18GW. That however has changed over the past years. At the end of the year 2012 the installed capacity worldwide was 238 GW. This grow happened with an average rate of more than 25%.

Solar photovoltaic (PV) installed capacity worldwide at the end of the year 2000 was 1.5 GW. At the year 2011 it was approximately 67 GW. And this number keeps growing. The estimation is that at the end of the year 2013 this number will be around 120 GW.

Hydro power has been one of the most explored sources of renewable energy. Even though it still continues its steady growth. While in the end of the year 2000 the installed power of Hydroelectric - run of the river plants combined with Hydroelectric – pumped storage was around 800 GW, at the end of the year 2010 it was around 1050 GW.[7]

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III. CURRENT RENEWABLE ENERGY SITUATION IN SLOVAKIA

As mentioned in the in introduction, every member of the EU committed to cover a certain percent of its country energy demand by the year 2020. The values of the renewable production in 2010 and planned renewable energy share in 2020 can be seen in Fig. 1 [8]

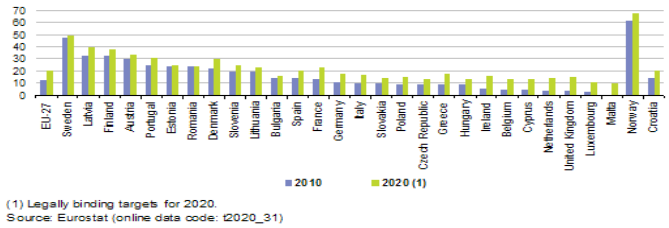

Fig. 1 Renewable production planed in EU countries in 2020

In terms of its national strategy, Slovakia's target for exploiting renewable sources of energy is to achieve a 14-percent share of all primary sources of energy consumed by 2020. Based on data by the Economy Ministry, the current share of renewable energy sources is above 11 percent, up from 6.7 percent in 2005 [9].

According the International Renewable Energy Agency (IRENA) the electricity use per capita for the year 2010 in Slovakia was 5164 kWh. The EU consumption per capita was 6285 kWh. While the world consumption per capita was 2863 kWh [10].

That implies that around 568 kWh per inhabitant was produced by a renewable source of energy.

And since around 20.4 % of renewables in Slovakia are produced by hydro [11], approximately 115 kWh was produced by hydropower plants

First it is necessary to analyse the electricity production from renewables (years 2009 and 2010):

Tab. 1 Electricity production in Slovakia (2009 and 2010)

Type	2009		2010	
	MW	GWh	MW	GWh
Run-of-the-river plants:				
< 1 MW	26	75	26	75
1 MW - 10 MW	63	181	66	190
> 10 MW	1508	4344	1508	4347
Pumped storage	916	236	916	394
Geothermal	0	0	0	0
Solar: (PV cells)	0	0	186	11
Wind	3	6	3	6
Biomass:				
Solid biomass	160	515	169	636
Biogass	4	22	9	32
Liquid biomass	0	0	0	0
SUM	2680	5379	2883	5691

Next table shows the potential of usage of different kinds of renewables:

Energy type	Technically utilizable potential [GWh]
Geothermal energy	6300
Wind energy	605
Solar energy	5200
Small hydro	1034
Large hydro > 10 MW	5573
Biogas	2500
Biomass	11237
Sum (w/o large Hydro)	26876
Sum	**32449**

Tab. 2 Potential usage of renewables in Slovakia

When considering the utilization of renewables only for electricity production, a reasonable estimate is 4506 GWh without large hydro, or 10 079 GWh with large hydro.[11]

IV. HYDROPOWER ENERGY POTENTIAL IN SLOVAKIA

At the beginning of this chapter we have to shortly describe three basic terms, while talking about the energy potential of the rivers.

Theoretical hydropower potential - is the sum of the theoretical hydropower potentials of all the rivers in a country. It is computed from average flows through a monitored sections of rivers, from a total head difference and while having 100% of energy transformation efficiency. The total hydro energetic potential in Slovakia is 13682 GWh/year[12].

Technical hydropower potential – it is always smaller than the theoretical potential because of sections of rivers that are technically not possible or not viable to utilize. Furthermore we also calculate with the efficiency while energy transformation from kinetic energy of the flowing water to the torque on the shaft. This efficiency is around 85%. The value of the technical hydropower potential in Slovakia is around 6700 GWh/year on 625 river profiles. These were picked using a 3D mathematical water level model of the rivers , so in case of their utilization they would not affect each other hydraulically.[13]

Ecological hydropower potential – Ecological potential further decreases the technical hydropower potential , since certain parts of the river profile is not possible to be utilized because of environmental issues. It also counts with the spillway section and fish pass section that decreases the flow going through the turbine and therefore cannot be utilized. [14]

The currently utilized technical hydropower potential is – 4575 GWh / year

The technical hydropower potential that is able to be used – 2125 GWh / year

Hydropower plants according the size can be divided into three main groups:

Large hydro - with the installed capacity > 10 MW
Small hydro – installed capacity from 0.1 to 10 MW
Micro hydro – installed capacity < 0.1 MW

It is however worth mentioning that these values may vary from country to country. For example Germany classifies large

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hydro from 5 MW, Italy from 3 MW, but India and China has large hydro only from 25 MW and Brazil from 30 MW.
The following table shows the theoretical hydropower potential in comparison with the technical hydropower potential[11]:

River	Tot. theor. Hydropower potential [GWh/y]	Tech. hydropower potential [GWh/year]
Morava	113	29
Dunaj	3394	2511
Váh, Malý Dunaj	5953	2985
Nitra	320	72
Hron	1406	427
Ipeľ	157	34
Slaná	314	96
Bodva	65	3
Hornád	807	262
Bodrog	692	138
Poprad a Dunajec	461	143
Sum SR	13682	6700

Tab. 3 Theoretical hydropower potential vs. technical hydropower potential

Another term to describe is the capacity factor of a hydropower plant. The power of a power plant can be computed as follows:

$$P = Q * H * \rho * g * \mu$$

P – Power is in watts,
Q – Flow in m^3 / s,
H – Head in m,
ρ - Water density in kg / m3,
g - Acceleration due to gravity
μ - Coefficient of efficiency ranging from 0 to 1
(usually the bigger the turbine the closer to 1)

The capacity factor of a power plant then can be computed using following formula:

$$CF = \frac{P_{generated}}{P_{*365*24}} * 100$$

$P_{generated}$ – Power generated over the year in MWh
P – Installed power in MWh
CF – capacity factor in %

V. The Growing Importance of Small Hydro

Slovak climatic and hydrological conditions are compatible with expanded reliance on hydro power. Large hydro denotes to a huge portion of whole hydropower output as seen on the following graph [11].

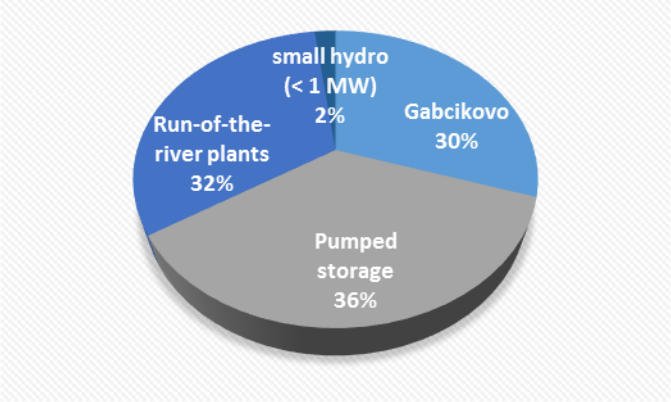

Fig. 2 Share of different types of hydropower plants in Slovakia

The largest hydro power plant, which is located in Gabcikovo, has an installed capacity of 720 MW and generates almost third of Slovakia's renewable electricity.
Slovakia's hydro power stations, which date back to the 19th century, also provide flood control services, as well as water for irrigated agriculture and industry; they also promote water transit by regulating stream flow.

However, construction of additional large hydro power stations now seems unlikely, due both to environmental concerns and to the high costs of providing under-served rural and mountainous communities with additional electricity supplies via the construction of large dams.
In these circumstances, the construction of additional small hydro stations could be a more cost effect and less environmentally intrusive solution.
More than 190 small hydro plants are currently in operation in Slovakia; their growing commercial viability in recent years has made possible reductions in feed-in tariff rates. The construction of additional small hydro plants by Slovakia's electricity generation company (and owner of large hydro power stations, Slovak Power Stations), is therefore anticipated—particularly in the Váh river basin.[15]

VI. Assembly Time Made Shorter

Because of these facts, the demand for small hydro power plants has been increasing in last few years. Companies producing turbine equipment need to react to the demand faster and organize the manufacture better than before. The rise in the manufacturing requires also an increase in manpower.
Manufacture and assembly of turbines however is a process that requires both technical thinking and skills. Hiring employees to the manufacture that have skills with turbine equipment is not an easy task, and employers often have to go below the set requirements just to get the labour force.
Therefore a set of – so called "part sheets" have been developed to make the work easier to the new hires (and also to the skilled workers) and ensure the high quality of the assembly process. Since turbine manufacturing is in no meaning a serial manufacturing, but each piece is a "prototype" these part sheets will vary from project to project,

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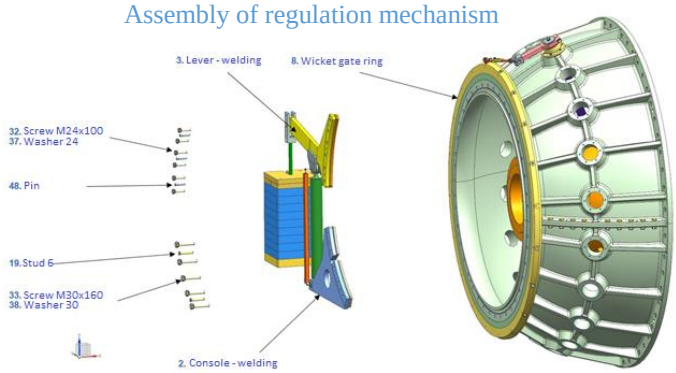
but the principle and template remain the same, to ensure a kind of standard.

These part sheets are also supposed to make the logistics simpler and more accurate. As each of the part sheets is showing all the required components, those can be brought in one package to the place where they are supposed to be assembled. That way all the required components should be on the spot for the employee to work with. That not only reduces errors, but also decreases assembly time, since the worker has all the required components next to him and does not have to look for them around the manufacture.

VII. Part Sheet Example

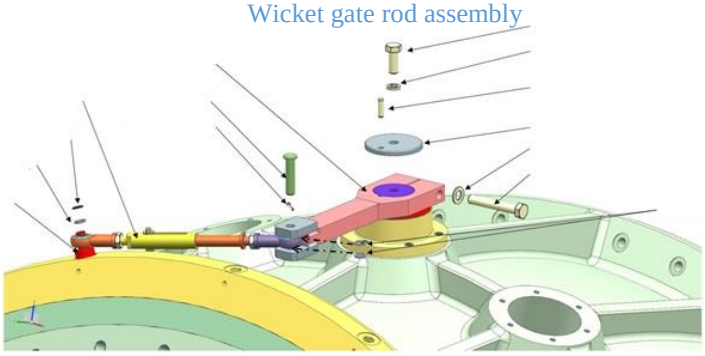
Assembly of regulation mechanism



N.	ITEM	N.	TYPE
2.	Welding construction - Console STM-09-0900041/1	1	PZ
3.	Welding construction - Lever 09-0900042	1	PZ
8.	Wicket gate ring 09-0800011	1	PZ
19.	Stud 6 STM-09-0800024/1	2	STD
32.	Screw M24x100 DIN 931 8.8 Zn	6	STD
33.	Screw M30x160 DIN 931 8.8 Zn	5	STD
37.	Washer 24 DIN 7980 Zn	6	STD
38.	Washer 30 DIN 7980 Zn	5	STD
48.	Pin 20x100 DIN 7978	3	STD

To retain this article in a reasonable length, only two more visualization from the part sheets developed this way, without the bill of materials, are going to be shown:

Wicket gate rod assembly



Runner shaft and runner assembly

VIII. Conclusion and Further Research

The usage of first six of these work sheets has been launched several months ago. Significant time savings have been observed using mainly work sheets where more complicated assembly parts are shown (wicket gate rod, runner, etc.).

The next stage will be aimed to quantify all the impacts of these work sheets. Time savings need to be quantified, and the part sheets, with small changes, need to be used in different projects to evaluate their versatility.

These part sheets shall be useful in three departments. In project management department to have a „big picture“ while assembly period is in progress. In the logistics department while planning the material flow. And most importantly in the manufacture, where these should contribute to shorter assembly time, less error rate and decreasing the downtimes.

These part sheets also play an important role in the company know-how, since each improvement in assembly, whether it is a reduction in material used, or reduction of components that leads to the same or a better performance is registered in a part sheet and leads to part sheet improvement. Therefore the next project can be done in the same or improved quality. In this case even the loss of a skilled labour force, does not necessarily mean the loss of know-how.

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Hedging Effectiveness Stock Index Futures Market: An Analysis on Malaysia and Singapore Futures Markets

N.Awang, N.A. Azizan, I. Ibrahim and R.M. Said

Abstract- This research investigates the hedging effectiveness of stock index futures markets in Malaysia and Singapore by employing various hedge ratio estimation methods, which comprises of the conventional OLS model, VECM, EGARCH and bivariate GARCH. The empirical results indicate that the Kuala Lumpur Futures Index (KLFI) provides higher hedging effectiveness compared to the Straits Times Index (STI) futures for OLS, VECM and EGARCH, but not for bivariate GARCH, which STI futures indicates higher hedging effectiveness. It is also shown that the KLFI provides more effective hedge for all hedge ratio estimation models compared to STI. The results also indicate that the OLS model performs most effectively in both index futures markets, followed by EGARCH. Thus, based on the findings, the OLS model could serve as a better hedging model than other static and time-varying models in a direct hedge using stock index futures. The evidence presented in this study strongly suggests that the KLFI and STI stock index futures contracts are effective tool for hedging risk, which is consistent with most of the earlier studies in index futures.

I. INTRODUCTION

Hedging is an essential function of stock index futures in order to control and reduce the risk of unfavorable price changes in spot market, while increase the value of the relevant stock index. The choice of effective hedging strategy is crucial for hedgers other than the efficiency of the futures market. Making the right hedging decision involves finding an optimal hedge ratio and hedging effectiveness [34]. For hedging to be effective, a futures price needs to be efficient as inefficient market would result in higher cost of hedging, which undermines the hedging effectiveness of the futures markets [12]. As mentioned by [24], the objective of hedging is to minimize portfolio risk, while the portfolio theory views hedging as a trade-off between risk and return. A key issue in hedging involves the determination of the optimal hedge ratio [31].

In relation to this, there are numerous empirical studies in the literature that focus on index futures hedging and the arguments centre around which model generates the best hedging performance. As the early literature estimate the hedge ratio and hedging effectiveness by employing the conventional static model, the recent studies concentrate on the time-varying measures in estimating hedge ratios. Thus, this research investigates the hedging effectiveness of stock index futures markets in Malaysia and Singapore by employing various measures of static and time-varying hedge ratios. It examines the extent of the consistency of previous studies on the hedging effectiveness in stock index futures markets. The coming section discusses the relevant literature which comprises of the traditional hedging theory as well as the empirical evidence on hedging effectiveness. Subsequent to that, the methodology of the research is presented, which comprises of data description and the empirical model of the research. The results and analysis are discussed next, which is then followed by the overall conclusion of the research.

II. LITERATURE

A. Traditional Hedging Theory

The relevancy of portfolio theory to hedging has attracted a great deal of attention from both academics and market participants. Among the first was [17] who introduced the concept of portfolio theory through hedging the cash position with futures. He assumes that all hedgers seek to minimize the risk, which is the variance of the change in value of the hedged position. Hedging is one of the most crucial elements in derivatives trading as it is part of risk management strategy in investment since it involves the use of derivatives as a means to reduce exposures that are associated with the volatility of financial variables. According to [27], hedging is the decision made by taking a position in a derivatives market such as futures, which is opposite to the position in the cash market, with the aim to reduce as well as to eliminate the price risk due to the decision of being long or short in the spot market. Hedgers will take the opposite positions in both derivatives and cash markets by focusing more on the direction of change in the price difference between both markets.

One of the main objectives of hedging is to choose the optimal hedge ratio, which is basically derived from the coefficient of the regression between the change in the spot prices and the change in price of the hedging instrument [10]. As the hedging of risk has therefore become a very important measure on investment given the volatile financial and economic environment, it is crucial to determine the optimal quantity of hedging instruments. Thus, the calculation of the optimal hedge ratio is one of the critical tasks in hedging. For that reason, there is a need for an investor to do an estimation of the proportion of the short position of futures contracts as

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oppose to the long position held in the cash market with the aim of minimizing the risk of the hedged portfolio.

An investor may hedge the whole portfolio or some portion of it while the hedge ratio is the size of the futures contract relative as oppose to the cash transaction. In general, the relationship between spot and futures market is traditionally defined as follows:

$$S_t = \alpha + \beta_1 F_{t-1} + \varepsilon_t \quad (1)$$

where S_t = spot price in period t
F_{t-1} = futures price at time $t-1$
β_1 = market risk

As the hedge ratio is represented as the coefficient in a regression of the price of the spot instrument on the price of the hedging instrument, to find the optimal hedging, the study calculates the hedge ratio, β by using the following equation:

$$S_t = \alpha + \beta F_t + \varepsilon_t \quad (2)$$

where S = spot price of underlying asset
F = futures price of hedging instrument
β_1 = hedge ratio
ε_t = random error term

As indicated by [10] and [14], the optimal hedge ratio may be defined as the quantities of the spot instrument and the hedging instrument that ensure that the total value of the hedged portfolio does not change. This can be formally expressed as follows:

$$V_h = Q_S S - Q_F F,$$

where,
V_h = value of hedged portfolio
Q_S = quantity of spot asset
Q_F = quantity of futures instrument.
S = price of spot asset
F = price of hedging instrument

and $\Delta V_h = Q_S \Delta S - Q_F \Delta F$

Thus if $\Delta V_h = 0$,

then $\frac{Q_F}{Q_S} = \frac{\Delta S}{\Delta F}$, we have perfect hedging.

now, let $\beta = \frac{Q_F}{Q_S}$, therefore,

$$\beta = \frac{\Delta S}{\Delta F}$$

where $\beta \equiv$ hedge ratio

Thus, β is the optimal hedge ratio, which is the coefficient of the above regression.

B. Empirical Evidence on Hedging Effectiveness

There is a significant amount of empirical research that attempt to examine hedging effectiveness of hedge ratios in various futures markets by using different methodologies and techniques [4], [33], [35], [24], [28] and [14]. Several methods for empirically estimating the hedge ratios have been proposed and developed. Previous empirical studies also vary in terms of the time-varying and constant nature of the hedge ratios. Some studies assume that the hedge ratio is constant over time while other studies allow the hedge ratio to change over time. A time-varying parameter model allows the hedge ratio to change overtime while a constant or static hedge ratio model is fixed at the optimum level and is not revised during the hedging period. According to [10], it has been argued in the literature that the true relationship between economic or financial variables can be better captured by time varying parameter models rather than fixed parameter models since the time-varying models have superior forecasting properties. In addition to that, a time-varying estimation of hedge ratio could result in more accurate forecasting properties. This is because the time-varying nature of the hedge ratio is due to the expectation and adjustment to unanticipated changes by the investors on their portfolio due to anticipated policy changes [14]. Existing empirical evidence generally has shown that time-varying hedging models which account for the time-variation in the joint distribution of the changes in spot and futures prices perform better than the constant or traditional OLS models in terms of greater risk reduction and higher expected utility especially in developed futures markets [29].

In estimating the effectiveness of futures hedging, research in developed economies has shown that the use of time-varying hedging model is more effective if compared to the conventional constant model [28], [30], [10], [11], [22] and [31]. A study by [28] measures the effectiveness of different hedging strategies in Italian stock market index and its futures contract, and it is concluded among others, that the time-varying features of the spot and futures index volatilities can be successfully exploited to improve futures hedging. In addition to the study, [10] investigate the optimal hedge ratio of the share price index in the Australia futures market using a time-varying model, and it has been shown that time-varying parameter models have performed better than static models. [30] investigates the hedging effectiveness of futures trading in London by using different techniques of measuring hedge ratio and the findings suggest that the time-varying hedge ratio provides better hedging strategies than other techniques, despite a smaller portfolio variance in some companies when protected with a constant hedge ratio. Other than that, [11] also study the hedging effectiveness of the S&P 500 and FTSE 100 index by employing several time-varying models together with static OLS model and discover that the time-varying copula-based GARCH models perform more effectively than other models.

Apart from research on futures time-varying hedging techniques as compared to static models undertaken in developed markets, there are also empirical studies that give attention to the same issue in emerging markets [14], [8], [29], [32] and [7]. Analyzing the time-varying hedge ratio using the *Kalman Filter* model on daily KLCI and making comparison with static hedging method, [14] find that time-varying

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technique performs better than the conventional static model. It is also found that the static model consistently over-hedged the index which could incur unnecessary cost, while the time-varying estimations perform better than the static model with lesser forecasting errors. Apart from that, [32] examine dynamic hedging effectiveness in South Korean index futures focusing on the impact of the Asian financial crisis. Even though the results show a decline in conditional volatility within market prices after the crisis, which indicate the relative performance of the constant hedge ratio, they argue that the findings are not significant enough to show that the constant hedge ratio is more superior to the time-varying technique. Another study by [8] investigates the hedging effectiveness of dynamic and constant hedging models in the Malaysian emerging market which is said to have lower liquidity and tight financial regulations. The study includes the test of equality of means and variances of the hedged portfolio using different hedging techniques in order to see whether there is any significant change in the mean and variance of the hedged portfolio,. The findings suggest that among others, a dynamic model is the best method of hedging effectiveness, which contributes to risk reduction while maximizing the expected utility.

Despite a range of empirical works suggesting that the performance of time-varying hedge ratio estimations is better than static hedge ratio estimation, there are also a number of existing empirical findings conclude the superiority of the OLS model in hedging effectiveness compared to other models [21], [34], [3], [5], [1] and [19]. For instance, investigating the hedging performance for five East Asian spot and futures stock markets, [21] discover that the OLS model proves to be the most effective risk reducer among other complicated models employed in their study, especially for stable markets such as Japan and Singapore, despite the higher returns generated by other models. In addition to that, [34] also conclude that the OLS model provides the greatest variance reduction for the Chinese index futures market when compared to other time-varying models. It is also concluded that the OLS hedge strategy may be a good choice considering the high transaction cost as the time-varying hedge ratios are less stable due to market fluctuations that may force hedgers to frequently adjust their futures positions. Other study by [3] also make the same suggestions that the OLS method performs well in hedging effectiveness of the FTSE-mid250 futures contracts. According to [4], the hedge ratio estimation using OLS model has been generalized to take into account the heteroscedastic nature of the error term.

In general, although there are various evidence suggesting the superiority of hedge ratios estimated using time-varying hedge ratio estimation over those calculated from static OLS models, nevertheless, no consensus have been arrived as yet and the results are mixed as to which method is the best. The literature has shown conflicting evidence thus, there is certain room for further research in this area. Among the various techniques employed by most empirical studies in measuring hedge ratios, this study employs a combination of time-varying and static hedge ratio estimation methods to investigates the hedging effectiveness. The time-varying hedge ratio estimation models comprises of bivariate GARCH, while the static hedge ratio estimation models employed in this research are the OLS, VECM and EGARCH models. Each of the techniques was estimated separately for the relevant stock index spot and futures prices in Malaysia and Singapore. At the end of the study, it is expected to determine the superiority of one technique to the other in terms of their hedging effectiveness.

III. METHODOLOGY

A. Data

The data series employed in this research is daily closing prices of the stock index together with daily settlement prices of stock index futures of nearby contracts for stock index futures contracts in Malaysia and Singapore. Thus this research consists of two time series of 10-year daily data. The daily data series for all the markets involve in this study was obtained from *Bloomberg* and the futures data refers to generic futures contracts which had been adjusted for rolling costs. The sample period is from January 2000 to December 2010 for the Malaysia's Kuala Lumpur Composite Index (KLCI), while the sample period for the Singapore's Straits Times Index (STI) is from June 2000 to December 2010.

B. Empirical Model

The time series data in the above estimations needs to be stationary since the existence of a unit root in a series implies that there is more than one trend in the series. Thus, it is necessary to first test whether each variable is stationary or non-stationary in order to avoid spurious regression results due to the use of non-stationary data [10] and [14]. If each one of the variable is non-stationary, a cointegration test need to be conducted. Thus, to test for stationarity of each variable, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were performed. For both tests, if the estimated test statistics resulted in insignificance *p-values*, the null hypotheses of integration of the first order cannot be rejected. It is concluded that the variable is integrated at I(1). Then, the next step is to investigate whether each variable becomes stationary after taking the first difference by taking another test.

Before estimating each model, a cointegration test is conducted between the two variables in order to avoid spurious and false inference. For this purpose, the [15] cointegration technique which is robust to varying error structures is employed. If the index futures contract and its relevant spot prices are cointegrated, then a long-run relationship must exist between these two series. For this purpose, a general *Var* model of order *k* is considered as follows:

$$\Delta \boldsymbol{X_t} = \boldsymbol{D} + \boldsymbol{\Pi X_{t-1}} + \sum_{i=1}^{k-1} \boldsymbol{\Gamma_i \Delta X_{t-i}} + \boldsymbol{\varepsilon_t} \qquad (3)$$

where $\Delta X_t = X_t - X_{t-1}$, D is a deterministic term, Π and Γ are matrices of coefficients. The cointegration relationship is examined by looking at the rank of the coefficient of matrix Π. If $\Pi = 0$, there is no cointegration vector, hence no cointegration relationship. If $\Pi = 1$, then the two series are cointegrated [16].

i. Hedge Ratio Estimations

Several methods for empirically estimating the optimal hedge ratio have been proposed and developed. The main techniques that are frequently debated in the literature are generally Ordinary Least Squares (OLS) Models, Error Correction (ECM) Models, and Autoregressive Conditional Heteroskedasticity (ARCH)-based Models. As there are various techniques of measuring hedge ratios, there are advantages and disadvantages of using each and every one of them. For that reason, this study employs several methods in estimating the hedge ratio, which comprises of static and time-varying hedge ratio estimations, and makes comparison on the hedging effectiveness of all the methods in the futures markets in Malaysia and Singapore.

In relation to this, four different methods of hedge ratio estimations are employed in this research to estimate hedge ratios, which are the conventional Ordinary Least Square (OLS) model, Vector Error Correction Model (VECM), Exponential Generalized Autoregressive Conditional Heteroscedasticity model (EGARCH) and Bivariate GARCH (BGARCH). As the OLS, VECM and EGARCH are the static models, the time-varying models are presented by BGARCH model. Subsequent to that, hedging effectiveness of the estimated hedge ratios from different models are then measured in order to determine which one model contributes to the highest level of hedging effectiveness in both futures markets in Malaysia and Singapore.

ii. Measuring Hedging Effectiveness

After modelling the four models of hedge ratios as discussed in the previous section, the performance of the hedge ratios were then compared to assess whether the more advanced time-varying hedge ratios which is BGARCH model could provide more effective hedging than other constant hedge ratios from the OLS regression, VECM and EGARCH. For the purpose of measuring hedging effectiveness, the measure by [6] is applied to all time-varying and static hedge ratio estimated from the models identified in this research. It is the most popular measure of hedging effectiveness as it defines hedging effectiveness as the reduction in variance while risk minimization is considered the main purpose of hedging. The performance of the different methods of measuring hedge ratios are compared using the measure of hedging effectiveness introduced by [6]. Following the study of [33], [7] and [35], the return on an unhedged portfolio are written as:

$$\boldsymbol{R_u = S_{t+1} - S_t} \quad (4)$$

While the return on a hedged portfolio is:

$$\boldsymbol{R_h = (S_{t+1} - S_t) - h'(F_{t+1} - F_t)} \quad (5)$$

where F_t and S_t are the futures and spot prices at time t, and h' is the hedge ratio. R_h is the return generated when going long on one unit of spot and short on h' units of futures at time t. Similarly, the variance of an unhedged portfolio is:

$$\boldsymbol{Var(Unhedged) = \sigma_s^2} \quad (6)$$

and the variance on a hedged portfolio is:

$$\boldsymbol{Var(Hedged) = \sigma_s^2 + h'^2\sigma_f^2 - 2h'\sigma_{s,f}} \quad (7)$$

where σ_s, σ_f represent the standard deviation of the spot and futures prices and $\sigma_{s,f}$ represent the covariance of both series.

The hedging effectiveness which is the percentage reduction in variance of the hedge portfolio to the unhedged portfolio as introduced by [6] is written as follows:

$$\boldsymbol{HE = \frac{Var(Unhedged) - Var(Hedged)}{Var(Unhedged)}} \quad (8)$$

IV. RESULTS AND ANALYSIS

A standard econometric practice in the analysis of financial time series data begins with a unit root test [31]. As the data series in the model needs to be stationary in order to avoid spurious regression results, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are used to test for all the variables under the null hypothesis of a unit root against the alternative hypothesis of stationarity. The results of the unit root tests for spot and futures return series are presented in Table 1. At levels, the unit root tests undertaken for all the return series which comprises of the variable spot and index futures could not reject the null hypothesis, which implies that they are non-stationary. Hence, the test was then run by taking the first differences of all the variable series, which rejected the null hypothesis at 1% significance level. This implies that all the series are stationary and integrated of first order (I(1)), and therefore the time series model is appropriate to be used to examine the behaviour of both spot and futures series.

Table 1 Unit Root Test Statistics for Spot and Futures Series

Stock Index	ADF	PP
KLCI		
Price Levels:		
Futures	-0.134989	-0.107033
Spot	0.037925	-0.042588
First Differences of Prices		
Futures	-53.72712	-53.72667
Spot	-44.86182	-44.98885
STI		
Price Levels:		
Futures	-0.768310	-0.778666
Spot	-0.683501	-0.713756
First Differences of Prices		
Futures	-52.17542	-52.16902
Spot	-50.83240	-50.83731

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Note: The values reported in the table are the t-statistics (Adjusted t-statistics for PP). The 5% critical levels for both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) are -2.8624 for both KLFI and STI.

A. Cointegration Tests

Before estimating the model, a cointegration test was conducted between the two variables in order to avoid spurious and false inference. For this purpose, the [15] cointegration technique which is robust to varying error structures was employed. If the index futures contract and its relevant spot prices are cointegrated, then a long-run relationship must exist between these two series. For this purpose, a general *Var* model of order *k* is considered as follows:

$$\Delta X_t = D + \Pi X_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \varepsilon_t$$

where $\Delta X_t = X_t - X_{t-1}$, D is a deterministic term, Π and Γ are matrices of coefficients. The cointegration relationship is examined by looking at the rank of the coefficient of matrix Π. If $\Pi = 0$, there is no cointegration vector, hence no cointegration relationship. If $\Pi = 1$, then the two series are cointegrated [16].

The trace and maximum statistics for all the spot and index futures contracts in all markets under study are shown in Table 2. For most of the markets, both test statistics gave the same results and rejected the assumption of no-cointegration. In addition to that, referring to Table 3 on the cointegrating vectors, it is shown that there exists a relationship between spot and futures prices in all futures markets, which implies that one of the series contains some information that can help predict its counterpart.

Table 2 Johansen Cointegration Tests (Spot vs. Futures)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic / Max-Eigen Statistic	0.05 Critical Value	Prob.**
KLCI				
Trace Statistic				
$r = 0$*	0.06736	188.9093	15.4947	0.000
$r \leq 1$	6.56E-0	0.177572	3.84146	0.673
Max Statistics				
$r = 0$*	0.06736	188.7317	14.2646	0.000
$r \leq 1$	6.56E-0	0.177572	3.84146	0.673
STI				
Trace Statistic				
$r = 0$	0.00531	15.09458	15.4947	0.057
$r \leq 1$	0.00039	1.051896	3.84146	0.305
Max Statistics				
$r = 0$	0.00531	14.04268	14.2646	0.054
$r \leq 1$	0.00039	1.051896	3.84146	0.305

Note: Trace test indicates 1 cointegrating eqn(s) at the 5% level. Max-Eigenvalue test indicates 1 cointegrating eqn(s) at the 5% level.
** denotes rejection of the hypothesis at the 5% level.*
***MacKinnon-Haug-Michelis (1999) p-values*

Table 3 Cointegrating Vector (Spot vs. Futures)

Stock Index	Spot	Futures
KLCI	1.000000	-1.004604 (0.00190)
STI	1.000000	-1.015052 (0.01554)

Note: Normalized cointegrating coefficients (standard error in parentheses)

B. Hedge Ratio Estimation Results

The results from the previous section reveal that all the spot prices and their corresponding index futures in Malaysia and Singapore are integrated of first order and they are cointegrated. Thus, the next step is to run all the four methods of hedge ratio estimations, which comprises of static and dynamic hedge ratios as identified earlier: OLS, VECM, EGARCH, and BGARCH models. The models were then compared to determine which one model could result in the most effective hedging for all the relevant index futures in different futures markets.

i. OLS Estimates

The Ordinary Least Squares (OLS) method is one of the conventional approaches in estimating the hedge ratio, which involves the regression of the changes in spot prices on the changes in futures price [18]. The slope coefficient of the OLS regression is considered as the minimum-variance hedge ratio which is the ratio of covariance of (spot prices, futures prices) and variance of (futures prices). In addition to that, the R-square of this model indicates the hedging effectiveness. The OLS equation is given as:

$$R_{St} = \alpha + \beta R_{Ft} + \varepsilon_t \quad (9)$$

where,

R_{St} = spot return
R_{Ft} = futures return
β = the optimal hedge ratio
ε_t = the error term in the OLS equation

OLS regression based on (9) has been used to calculate the hedge ratio and hedging effectiveness. The slope of the

regression equation gives the hedge ratio and R^2 is the hedging effectiveness.

Table 4 OLS Regression Model Estimates

	KLCI	STI
A	-0.008044	-0.048650**
B	1.001334**	1.004822**
R^2	0.9972	0.9945

* denotes significance of estimates at 10% level
** denotes significance of estimates at 5% level

As indicated in Table 4, for all index futures contracts, the hedge ratio (β) is higher than 0.90. Thus, it can be concluded that the hedge ratios estimated from OLS method provide approximately 90% variance reduction for all index futures contracts, which indicates that the hedge provided by these contracts in all futures markets in the study are effective. Hedging effectiveness was highest for KLFI futures as it provides 99.7% of hedging effectiveness as compared to STI 99.5%.

ii. VECM Estimates

Vector Error Correction model (VECM) is more appropriate if two prices are cointegrated in long run since it accounts for long-run cointegration between spot and futures prices. As argued by [20], VECM could be best specified model for the estimations of constant hedge ratio and hedging effectiveness as it involves long term cointegration between spot and futures prices, even though it does not consider the conditional covariance structure of spot and futures price. If the futures and spot series are cointegrated of the order one, then the VECM of the series is given as:

$$\boldsymbol{R_{St}} = \boldsymbol{\alpha_S} + \boldsymbol{\beta_S S_{t-1}} + \boldsymbol{\gamma_F F_{t-1}} + \sum_{i=2}^{k} \boldsymbol{\beta_{Si}} \boldsymbol{R_{St-i}} + \sum_{j=2}^{l} \boldsymbol{\gamma_{Fj}} \boldsymbol{R_{Ft-j}} + \boldsymbol{\varepsilon_{St}} \quad (10)$$

$$\boldsymbol{R_{Ft}} = \boldsymbol{\alpha_F} + \boldsymbol{\beta_F F_{t-1}} + \boldsymbol{\gamma_S S_{t-1}} + \sum_{i=21}^{k} \boldsymbol{\beta_{Fi}} \boldsymbol{R_{Ft-i}} + \sum_{j=2}^{l} \boldsymbol{\gamma_{Sj}} \boldsymbol{R_{St-j}} + \boldsymbol{\varepsilon_{Ft}} \quad (11)$$

where S_t and F_t are natural logarithm of spot and futures prices. The error terms in the equations, ε_{St}, and ε_{Ft} are independently identically distributed (*IID*) random vector. The minimum variance hedge ratio are calculated as:

$$\boldsymbol{H} = \frac{\boldsymbol{\sigma_{sf}}}{\boldsymbol{\sigma_f}} \quad (12)$$

where,

$Var(\varepsilon_{St}) = \sigma_s$
$Var(\varepsilon_{Ft}) = \sigma_f$
$Cov\,(\varepsilon_{St}, \varepsilon_{Ft}) = \sigma_{sf}$

Table 5 Estimates of VECM Model

a) Spot Prices

	KLCI	STI
A	0.00098	0.000005
β_{S1}	-0.164295**	-0.407939**
β_{S2}	-0.106856**	-0.242313**
β_{S3}	-0.099650**	-0.144559**
β_{S4}	-0.050684**	-0.088441**
β_{S5}	-0.022690**	-0.007166
γ_{F1}	0.518661**	0.937725**
γ_{F2}	0.261250**	0.414591**
γ_{F3}	0.099436**	0.235575**
γ_{F4}	0.080186**	0.149786**
γ_{F5}	0.048475**	0.084253**
R^2	0.7596	0.9310

* denotes significance of estimates at 10% level
** denotes significance of estimates at 5% level

b) Futures Prices

	KLCI	STI
A	0.000161	0.000163
β_{F1}	0.091218**	-0.026605
β_{F2}	0.103832**	0.063318
β_{F3}	-0.014968	0.044609
β_{F4}	0.073786*	0.080622
β_{F5}	0.027221	0.001502
γ_{S1}	-0.056867	-0.033651
γ_{S2}	0.088058*	-0.052738
γ_{S3}	-0.088879*	-0.050627
γ_{S4}	-0.007542	0.010079
γ_{S5}	-0.003899	-0.042580**
R^2	0.0116	0.0046

* denotes significance of estimates at 10% level
** denotes significance of estimates at 5% level

VECM model is supposed to be best specified model for the estimations of constant hedge ratio and hedging effectiveness as it considers long-term cointegration between spot and futures prices [20]. In relation to this, errors are estimated and hedging effectiveness and hedge ratio were calculated from the VECM model. Results of the (10) and (11) are presented in Table 5(a). In addition to that, Table 5(b) demonstrates the estimates of hedge ratio and hedging effectiveness of futures contracts using VECM static model.

Based on the hedge ratio obtained from VECM model as shown in Table 5, hedging effectiveness were then calculated using [6]'s measure of hedging effectiveness. Table 6 shows the estimation of hedging effectiveness which indicates that the hedging effectiveness of KLFI and STI were rather high with 0.996449 and 0.9936054 respectively.

Table 6 Hedge Ratio and Hedging Effectiveness Estimations (VECM Model)

	KLCI	STI
Variance (ε_S)	0.258194	0.287164
Variance (ε_F)	0.257491	0.285001
Hedge Ratio	1.004893	1.016685
Covariance (ε_F, ε_S)	0.066365	0.081586
Variance (Unhedged)	0.066664	0.08246316

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Variance (Hedged)	0.000237	0.000527
Hedging Effectiveness	0.996449	0.9936054

iii. EGARCH Estimates

Exponential-GARCH (EGARCH) model was introduced by [23] and the model does not require non-negativity constrain to be imposed. The model was designed to capture the leverage effect and allow for asymmetric shocks to volatility [9]. It is also argued by [25] that the model is widely employed in various empirical studies since it is able to capture both volatility persistence and asymmetric effect of returns. A simple variance specification of EGARCH is given by:

$$\log \sigma_t^2 = \omega + \beta \log \sigma_{t-1}^2 + \alpha \left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| + \gamma \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \qquad (13)$$

where ϖ , α, β and γ are constant parameters. The left-hand side is that of the conditional variance. This implies that the leverage effect is exponential, rather than quadratic, and those forecasts of the conditional variance are guaranteed to be non-negative. As, the level $\frac{\varepsilon_{t-1}}{\sigma_{t-1}}$ is included, the model will be asymmetric if $\gamma \neq 0$. The presence of leverage effects can be tested by the hypothesis that $\gamma > 0$. If the leverage effect term, γ, after running the appropriate regression, is negative and statistically different from zero, this will imply that positive shocks generate less volatility than negative shocks (bad news).

The estimation resulted from EGARCH (1,1) model based on (13) for different index futures is listed in Table 7 indicate that all terms are statistically significant. In addition to that, the leverage effect term γ is positive and statistically different from zero for both index futures. This implies the existence of the leverage effect which indicate the evidence of asymmetry. Thus, negative shocks generate less volatility than positive shocks (good news).

The optimal hedge ratios for all index futures are slightly below than unity; KLFI (0.997678) and STI (0.997660). The adjusted R^2 for both index futures indicating a nice fit as all the values were above 95%.

Table 7: Results from the EGARCH(1,1) Model

Variable	Coefficier	SE	*z*-Stat	Prob.
		KLCI		
ΔF_t^*	0.997678	0.00078	1275.02	0.000(
γ	0.017894	0.00999	1.79081	0.073
EGARCH(	0.962160	0.00826	116.457	0.000(
Adjusted R^2 = 0.997200		SE of Regression = 0.013662		
		STI		
ΔF_t^*	0.997660	0.00004	21994.3	0.000(
γ	0.024585	0.00944	2.60368	0.009
EGARCH(	0.960125	0.00968	99.1784	0.000(
Adjusted R^2 = 0.993973		SE of Regression = 0.022294		

Table 8: Hedge Ratio and Hedging Effectiveness Estimations (EGARCH Model)

	KLCI	STI
Variance ($\varepsilon_{S)}$	0.258194	0.287164
Variance ($\varepsilon_{F)}$	0.257491	0.285001
Hedge Ratio	0.997678	0.997660
Covariance (ε_F, $\varepsilon_{S)}$	0.066365	0.081586
Variance (Unhedged)	0.066664	0.082463
Variance (Hedged)	0.000236	0.000519
Hedging Effectiveness	0.996454	0.993708

From the hedge ratio obtained from the results in Table 7, hedging effectiveness were then calculated using [6]'s measure of hedging effectiveness. The calculated hedging effectiveness estimations are indicated in Table 8 below. The hedging effectiveness of KLFI is higher than STI futures, which is 0.996454 as opposed to 0.993708 for STI futures.

iv. Bivariate GARCH Estimates

The bivariate generalized autoregressive conditional heteroskedasticity model (bivariate GARCH) model proposed by [2] is widely used in the literature due to its capability to capture some characteristics of returns, which include leptokurtosis, skewness and volatility clustering [13]. In addition to that, the model is also able to capture the spillover of volatility and the dynamics of the conditional variance by estimating the parameters for both spot and futures markets simultaneously. The results from the bivariate GARCH model were used to determine the dynamic hedge ratio at time *t* (β)**,** which is calculated as the ratio of the conditional covariance between the spot and the futures market returns to the conditional variance of the futures market return.

A bivariate GARCH (1,1) model is given by:

$$\boldsymbol{R_{St}} = \boldsymbol{\alpha_S} + \sum_{i=1}^{k} \boldsymbol{\beta_{Si}} \boldsymbol{R_{St-i}} + \sum_{j=1}^{l} \boldsymbol{\gamma_{Fj}} \boldsymbol{R_{Ft-j}} + \boldsymbol{\varepsilon_{St}} \qquad (14)$$

$$\boldsymbol{R_{Ft}} = \boldsymbol{\alpha_F} + \sum_{i=1}^{k} \boldsymbol{\beta_{Fi}} \boldsymbol{R_{Ft-i}} + \sum_{j=1}^{l} \boldsymbol{\gamma_{Sj}} \boldsymbol{R_{St-j}} + \boldsymbol{\varepsilon_{Ft}} \qquad (15)$$

$$\begin{bmatrix} h_{ss} \\ h_{sf} \\ h_{ff} \end{bmatrix} = \begin{bmatrix} C_{ss} \\ C_{sf} \\ C_{ff} \end{bmatrix}_t + \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} \end{bmatrix} \begin{bmatrix} \varepsilon_s^2 \\ \varepsilon_s \varepsilon_f \\ \varepsilon_f^2 \end{bmatrix}_{t-1} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} \\ \alpha_{21} & \beta_{22} & \beta_{23} \\ \beta_{31} & \beta_{32} & \beta_{33} \end{bmatrix} \begin{bmatrix} h_{ss} \\ h_{sf} \\ h_{ff} \end{bmatrix}_{t-1}$$

where, h_{ss} and h_{ff} are the conditional variance of the errors ε_{st} and ε_{ft} and h_{sf} is the covariance.

[2] proposed a restricted version of the above model in which the only diagonal elements of $\boldsymbol{\alpha}$ and $\boldsymbol{\beta}$ matrix are considered and the correlations between conditional variances are

assumed to be constant. The diagonal representation of the conditional variances elements h_{ss} and h_{ff} and the covariance element h_{sf} is presented as [2]:

$$h_{ss,t} = C_{ss} + \alpha_{ss}\varepsilon^2_{s,t-1} + \beta_{ss}h_{ss,t-1} \quad (16)$$

$$h_{sf,t} = C_{sf} + \alpha_{sf}\varepsilon_{s,t-1}\varepsilon_{f,t-1} + \beta_{sf}h_{sf,t-1} \quad (17)$$

$$h_{ff,t} = C_{ff} + \alpha_{ff}\varepsilon^2_{f,t-1} + \beta_{ff}h_{ff,t-1} \quad (18)$$

Time varying hedge ratio is calculated as follows:

$$\beta_t = \frac{h_{sft}}{h_{fft}} \quad (19)$$

The estimation results on the bivariate diagonal GARCH(1,1) representation of the conditional variances elements h_{ss} and h_{ff} and the covariance element h_{sf} are presented in Table 9. All the estimated parameters of the bivariate GARCH minimum variance model using the maximum likelihood method is reported in the table.

Table 9: Estimates of Bivariate GARCH Model

	KLCI	STI
C_{ss}	0.000012**	0.000017**
C_{ff}	0.000025**	0.000008*
C_{sf}	0.000012**	0.000010**
α_{ss}	0.310719**	0.209319**
α_{ff}	0.307174**	0.202694**
α_{sf}	0.308941**	0.205957**
β_{ss}	0.696364**	0.790220**
β_{ff}	0.608369**	0.796241**
β_{sf}	0.697366**	0.793250**

* denotes significance of estimates at 10% level
** denotes significance of estimates at 5% level

Based on the variance equations for the spot and the futures market, the dynamic conditional variance for both markets was generated. It is observed that all the parameters for the variance and covariance equations are highly significant. This indicates that previous variance and residuals have significant impacts on the conditional variance of the subsequent period [22].

From the results on the diagonal representation, time-varying hedge ratio for stock index futures in various markets have been estimated using bivariate GARCH(1,1) parameters obtained from (14) and (15). The statistical properties of hedge ratios obtained from bivariate GARCH(1,1) model for both KLFI and STI index futures are given in Table 10. Based on the value of the mean hedge ratio, the optimal time-varying hedge ratios for both markets are different; KLFI is 0.948226 and STI is 0.973005. The graphs of time-varying hedge ratios estimated from constant conditional correlation and time varying covariance structure of spot and futures prices in Malaysia and Singapore index futures markets are shown in Fig. 1.

Table 10: Statistical Properties of Dynamic Hedge Ratio (Bivariate GARCH)

	KLCI	STI
Mean	0.948226	0.973005
Max	1.630372	2.363294
Min	0.004025	-0.961556
SD	0.174012	0.248635

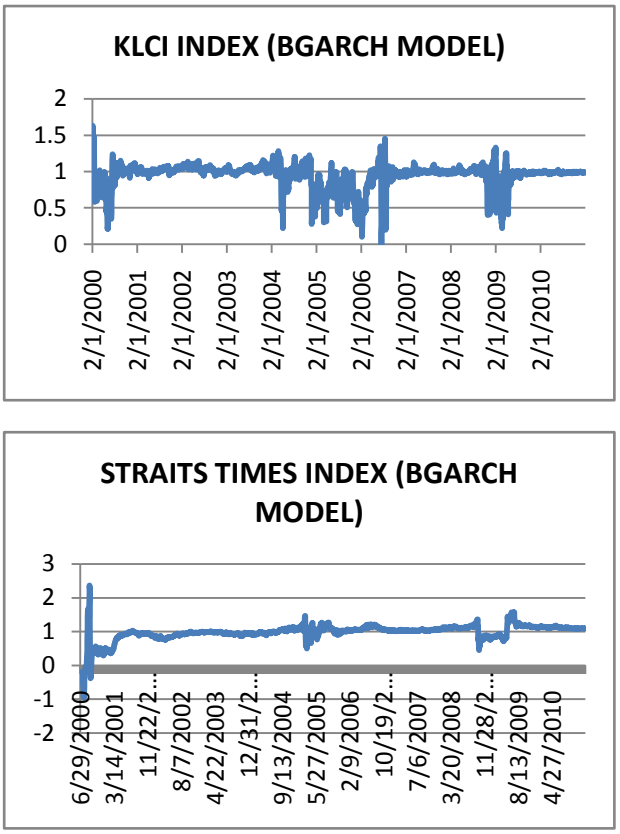

Figure 1: Estimates of Time-Varying Hedge Ratio from BGARCH Model

From the time-varying hedge ratios obtained from the bivariate GARCH(1,1) model, hedging effectiveness were then calculated using Ederington (1979)'s measure of hedging effectiveness. It is shown that the hedging effectiveness of STI futures (0.9564880) was higher than that of KLFI's (0.9241520).

C. Hedge Ratio and Hedging Effectiveness

The empirical results from three static and a time-varying hedging models for stock index futures in Malaysia and Singapore are given in Table 11. The results show that the hedge ratios which are estimated using different methods are significant at 5% significant level, which indicate that the stock index futures can be used to

hedge against their underlying spot prices. It also reveals that the estimated optimal hedge ratios from the VECM model are the largest for both index futures markets. After VECM model, the second highest estimation of optimal hedge ratios is the OLS model, which scores 1.001334 for KLCI and 1.004822 for STI.

Table 11 Comparison of Optimal Hedge Ratio Estimates by Different Model

	KLCI	STI
OLS	1.001334	1.004822
VECM	1.004893	1.016685
EGARCH	0.997678	0.997660
BGARCH	0.948226	0.973005

It is shown from the empirical results that the VECM model, which is a static model, produces the highest hedge ratio for both index futures markets, while the static OLS model comes after the VECM. However, as indicated in the literature, the results are inconsistent with various studies which conclude that time-varying estimations are superior than static model in estimating higher hedge ratios. For instance, investigating the optimal hedge ratio for international index futures market, [22] discover that all of the minimum variance hedge ratios estimated from the GARCH models, which are time-varying models, are slightly larger than those estimated from OLS method. In addition to that, [20] also discover that the mean hedge ratio estimated from the time-varying conditional variance and covariance between spot and futures returns are higher than other methods. According to them, the hedger has to adjust their futures positions more often as the dynamics hedge ratio are less stable and fluctuate more.

Further to estimating hedge ratios using both static and time-varying models, the results from four different models were further tested to find out which of them provides the greatest variance reduction and better hedging performance. Hedging effectiveness was measured and compared using four types of hedging models. The hedge ratios obtained from the methods of OLS, VECM, EGARCH and bivariate GARCH models were employed. The main question is which models that estimate different hedge ratios generate better results in terms of hedging effectiveness. According to [7], selection of the hedge effectiveness measure has a considerable impact on the assessment of hedged portfolios. For this research, hedging effectiveness (variance reduction) of the stock index futures in different markets was measured using [6]'s model as follows:

$$HE = \frac{\sigma^2(Unhedged) - \sigma^2(OLS, VAR, VECM\ or\ EGARCH)}{\sigma^2(Unhedged)}$$

Table 12 presents the hedging effectiveness of each model. The empirical results indicate that the KLFI provides higher hedging effectiveness compared to STI futures index for OLS, VECM and EGARCH, but not for bivariate GARCH, which STI futures indicates higher hedging effectiveness. It is also shown that the KLFI provides more effective hedge for all hedge ratio estimation models compared to STI. The results also indicate that the OLS model performs most effectively in both index futures markets, followed by EGARCH. Thus, based on the findings, the OLS model could serve as a better hedging model than other static and time-varying models in a direct hedge using stock index futures. In general, the hedging effectiveness for almost all index futures using different model were all above 90%, which indicates that the index futures can help investors to hedge risk in spot market to a large extent.

Table 12 Comparison of Hedging Effectiveness Estimates by Different Model

	KLCI	STI
OLS	0.9964643*	0.9937530*
VECM	0.9964490	0.9936054
EGARCH	0.9964537	0.9937079
BGARCH	0.9241520	0.9564880

Note: * denotes the highest value of hedging effectiveness among other models

The superiority of the OLS model in hedging effectiveness compared to other models as revealed in the findings of this study is consistent with a number of existing empirical findings [21], [34], [3], [5], [1] and [19]. For instance, investigating the hedging performance for five East Asian spot and futures stock markets, [21] discover that the OLS model proves to be the most effective risk reducer among other complicated models employed in their study, especially for stable markets such as Japan and Singapore, despite the higher returns generated by other models. In addition to that, [34] also conclude that the OLS model provides the greatest variance reduction for the Chinese index futures market when compared to other time-varying models. Other study by [3] also make the same suggestions that the OLS method performs well in hedging effectiveness of the FTSE-mid250 futures contracts.

On the other hand, the findings are inconsistent with some studies which argue that time-varying models prove to be the most effective hedging tools than the conventional OLS model [31], [21] and [11]. [31] study the hedging effectiveness of CSI300 futures with bivariate GARCH model and conclude that the model performs the best in hedging the stock index futures. Another empirical study by [22] on hedging effectiveness of: various Asian stock index futures and find out that the minimum variance hedge ratios estimated from the GARCH models are slightly larger than those estimated from OLS method. They also state that the methods of estimating optimal hedging in different markets are different. In addition to that, [11] also study the hedging effectiveness of the S&P 500 and FTSE 100 index by employing several time-varying models together with static OLS model and discover that the time-varying copula-based GARCH models perform more effectively than other models.

V. CONCLUSION

The evidence presented in this study strongly suggests that the KLFI and STI stock index futures contracts are effective tool for hedging risk, which is consistent with most of the earlier studies on the relevant index futures. Hence, the introduction of the stock index futures contract has given portfolio managers and investors a valuable financial instrument by which they can avoid risk without liquidating their spot position or changing their portfolios composition [18].

From the finding, it is shown that the conventional static OLS hedge strategy might be a good preference considering the high transaction cost in the market. As the dynamic hedge ratios are less stable and having distinct fluctuations, the hedgers need to adjust their futures positions frequently. As mentioned by [34], since the OLS does not require adjusting positions on futures while could save some transaction cost, the method can be used as the best hedging mechanism in index futures market. Furthermore, compared to other models, the OLS model is simple and parsimonious.

The findings of this study should be especially of interest for hedgers and speculators who are actively involved in futures trading in Malaysia and Singapore futures markets, specifically the findings on the forecasting ability of stock index futures markets as well as on the effectiveness of hedging with futures to manage price risks. Basically hedgers prefer an efficient market since prices always fully reflect available information which do not require an analysis of market data to make hedging decisions as they use futures contracts to offset exposure to price fluctuations and to minimise the unwanted price risk. As for speculators, they are interested on generating excess returns by forecasting stock index prices and take a corresponding futures position. According to [26], speculators analyze market data to generate trading strategies and to get excess return as most forecasting systems are based on market inefficiencies. Apart from direct market participants such as hedgers and speculators, information and research regarding futures markets is also valuable to economic agents who are making economic decisions based on the information on the futures prices as predictors of future spot prices.

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Project ownership and steering committee challenges in international context

Matti Kutila, Maria Jokela, Serena Fruttaldo, Roberto Montanari, Nereo Pallaro

***Abstract*—** This study focuses on discussing and analysing the results of the project steering group maturity review executed at VTT in 2012. The survey was conducted for 50 projects whose complexity level varied between medium and high. One of the major outcomes of the study is the definition and role of the project owner in multi-national projects co-funded by more than one organisation. These types of projects typically include a large consortium in which project manager needs to be competent to lead both internal and external people. The results of this study promote the development of communications between line organisation and project managers, which is also valid when managing the consortiums including external partners.

The results of the review lead us to consider ways to develop and try out new project management practices on the DESERVE-Artemis project. The project has a multi-national feature, including 25 European automotive manufacturers and their suppliers and research organisations working together. One example is the method of mentoring young talents in a project management career with close collaboration between the steering group representative of VTT and the young project manager. In this article, the role of the project owner as a supervisor and mentor of a project manager has been examined. The second development target is the improved communication with customers in order to ensure common goals and business benefits for the project.

***Keywords*—**project manager, consortium, project owner, communication, management, steering group, DESERVE

I. Introduction

THIS study discusses experiences in improving project steering groups working at the VTT Technical Research Centre of Finland, which is the third largest European applied research organisation. The internal questionnaire was circulated in 2012 in order to cross-review the opinions of the current project managers, line managers and steering group representatives concerning project steering group processes at VTT. The development programme was initiated in 2005 in order to improve the competence of project managers in dealing with the most demanding and riskiest projects at VTT. In addition, more attention was paid to the work of the steering committee, which defines the business benefits of the project and is in charge of supervising alignment with company strategy.

VTT has been one the pioneers in doing project-based research in Finland. The projects are the heart of the processes, and all the other functions are intended to support project execution. VTT operates continuously with more than 2,200 projects, and 35% of these belong to the medium or high complexity category, which provides 75% of actual revenue. The same change has also been observed globally by Kwak & Anban [1], who propose that more fundamental level research be conducted in order to understand the project governance practices for supporting the execution of ever more complex projects. Due to the importance of projects for VTT, project management procedures and steering committee work is under scrutiny in order to guarantee customer satisfaction, which is one of the core values of VTT.

The new methods and improved processes between the project manager and the steering committee representative have been tested in the DESERVE-Artemis project, which started on September 1, 2012. A large European consortium (25 partners) including automotive manufacturers (Daimler, Volvo and Fiat), their suppliers (Continental, Bosch, etc.) and research organisations (INRIA, VTT, ICOOR) is working together to develop a reference technology platform for the future, Advanced Driver Assistance Systems (ADAS). Because it has almost 30 work packages, the project has been divided into 8 sub-projects. The leaders of the sub-projects, coordinator and technical coordinator form the steering committee. Moreover, the coordinator and project manager tasks at VTT have been divided between two persons in order train the new talent to the project manager career path.

The main aim of the article is to review the VTT's project ownership and management procedures and study with using the DESERVE project to test some improvements. The hypothesis of this article is that the defining and carefully selecting the project steering group representatives and having efficient communication in management level, both

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company and project will produce more business benefits.

The article has been divided into the following sections. First the literature concerning existing work is reviewed. Then the results of the steering group study in VTT are explained. Thereafter, the experimental study in order to improve practices in the DESERVE project are explained. Finally there is a discussion and conclusions are made.

II. Literature review

One of the key problems of the projects is resourcing, especially when the project-based organisation is fitted inside the line or matrix organisation. Englund & Graham [2] discovered that a common problem in companies is having too few people trying to supervise too many projects in parallel. This causes problems when trying to align projects with the strategy of the company. They recommend that upper management follows only the identified key projects.

Zikos & Diomidous [3] encountered the typical problem of multi-national EU-funded projects, namely that the procedures in research data collection are different. Therefore, they nominated a country manager to keep the procedures harmonised. This is also valid in the DESERVE project, which will be discussed later as a challenging project management experience. The project has partly been funded by the national funding agencies, and therefore properly selected country coordinators are essential in order to align the national objectives with the international ones. Klimkeit [4] took even step further with introducing the standard framework for international collaboration.

The study by Suomala et al. [5] explored managerial assessment of projects. They were trying to create a framework for identifying long-term business benefits in the projects. They discovered that usually even profitable projects are not initiated properly in terms of meeting long-term results. Mutka & Aaltonen [6] found in their research that, even if project business models are derived top-down from company business goals, the projects should also create their own autonomous business opportunities as a side-product. This is important especially in the long projects whose duration is more than 18 months, due to continuous changes in the business environment these days.

Pemsel & Wiewiora [7] noticed that Project Management Offices (PMOs) are important brokerages and communication points between the project team and top management. However, in addition to the internal communication between the project team members, the interaction should, according to Dawes [8], be extended to the external stakeholders and customers. Seamless cooperation between the PMOs and steering committees of the projects are essential according to Engle [9]. PMOs are in charge of project quality issues in most cases by supervising that company quality procedures and policies are followed [10]. Moreover, companies usually have specific programme managers to take care of project portfolios and align them with the company goals. Fitsilis et al. [11] even proposed standards for project procedures. They observed positive influence on the implementation of national projects in Greece after the ELOT 1429:2008 standard was implemented. The standardised way has caused a boom which is becoming more popular in implementing new projects and has had a positive influence on project performance.

Buganza et al. [12] observed significant impact on project management training from the commitment of company strategic targets and professional project management methodologies. Gerbault [13] studied the use of organised round table discussion. The aim is to train people to understand the big picture of the EU project, even if they are working on a small part of the whole concept.

Lechler & Cohen [14] discovered that effective steering committee work is important for project success. The steering group members should take an active role to steer, define, initiate and control the project's execution throughout its life cycle. Zwikael & Smyrk [15] outlined that the steering committee is the main decision-making body of the project and makes the all-significant decisions, including approval of the project results. All the steering committee representatives should be totally committed to the success of the project.

Kelly [16] considered that executives like the CEO, CFO, legal counsel and heads of manufacturing, marketing and sales, R&D, IT and HR should be steering group representatives on the significant company level development projects because of their strong commitment. The statistic reported by Wrycza [17] shows that those IT projects which nominated a properly selected steering group were more successful than the ones did not have the steering committee. The crucial issue is that steering committee members have sufficient time and interests available for the project. In addition, they should have a sufficient mandate for decision-making on behalf of the company as regards project results and resource reallocation [18]. The roles of the steering group representatives should be well defined in advanced, according to Zwikael & Smyrk [19] and Sehested & Sonnenberg [20]. Moreover, the meetings should be regular (e.g. monthly) in order to have sufficient continuity of monitoring duties. Andel [21] recalls that the overall project risk management should also to be supervised by the project steering committee.

III. The steering group survey in VTT

A. Data collection

VTT divides the projects into three different categories according to their management complexity. These are called Light, Standard and Demanding. Most of the international projects, in which the volume of VTT is about 700 k€ and having the role of leading a work package belongs to the Standard class. When the management part is exceptionally complex, having a project or at least sub-project coordinator role, with multiple stakeholders or major financial or device

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breakdown risks, these projects are considered to be demanding ones.

The internal study was conducted for 50 projects of which 8 belong to the demanding category and the rest to the standard category. The volume of the projects varied from 22 k€ up to 2,100 k€ (see Fig. 1). The online questionnaire was sent to the project owners, project steering group members and project managers in order to compare their responses concerning the roles, responsibilities and interaction in executing the projects. Proper responses from 40 different projects were received.

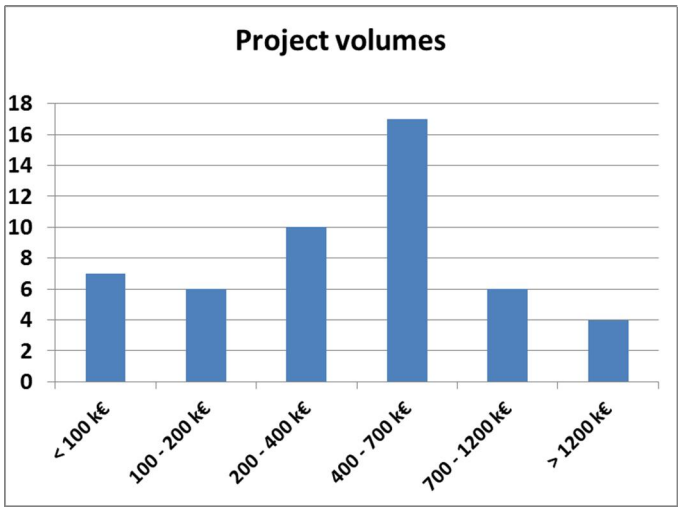

Fig. 1 The budget variation of the projects selected for the internal project governance survey at VTT.

B. *Results of the study*

The results indicated that in 66% of the cases project manager was nominated by his/her manager and in 17% of the cases the project manager was automatically the project drafter. In 7% of the projects, the customer required the nomination of a certain person to be the project manager. Since this study did not cover the Light category projects, this was a surprising issue. In the case of small projects the customer and the project manager are typically familiar with each other, and the customers may have preferences about who they would like to work with. However, Standard-level projects are bigger, and more project management skills are needed. Therefore, the final decision should come internally from the manager instead of from external customers.

On the other hand, the steering group representative was nominated by the line manager in 67% of the cases, and in a couple of cases the representative was not aware where the mandate originally came from. The owner of the project nominated the SG representative in only 13% of the cases. The problem seems to exist if the project owner and project steering group representative are not the same person. The role of project owner is minimal without having chance to join to the steering committee meetings.

Fig. 2 indicates how the project manager, steering group representative and line manager saw the interaction between themselves. The results show that line organization and steering group members felt the interaction was better than did the project manager. On the other hand, the written comments of the line managers criticized that the content of the communication is not on a sufficient level.

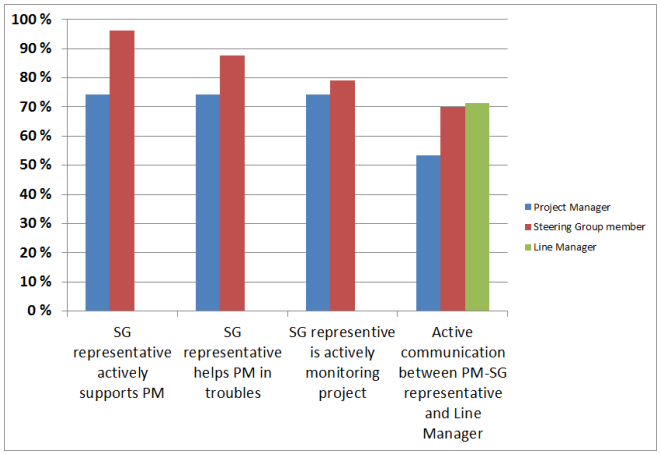

Fig. 2 Interaction between Project Manager, Steering Group representative and Line Manager

The survey also indicated that in 15% of the cases the project manager did not communicate at all before the SG meeting with the steering group representative, as Figure 3 indicates. However, the interesting thing was the diversity of written comments. Some project managers complained about a lack of a proper steering group which would also support the project manager in his decision-making. The others thought that the steering group is not needed, but is only an additional bureaucratic element, which is true when considering very small go-and-do types of work.

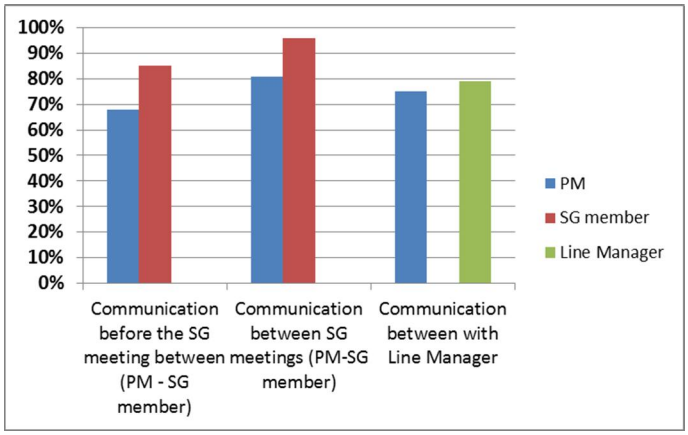

Fig. 3 Interaction between steering group representative, project manager and line manager

IV. Implementation of Best Practices in DESERVE

A. *Project overview*

The internal project steering group practices developed during 2012 after the project ownership study have been

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partly developed in the DESERVE-Artemis-JU project, which is co-funded by the European Union and national funding agencies [22]. The project includes 25 partners from 10 different European countries. It includes major European automotive manufacturers (Fiat, Daimler, Volvo), their suppliers (Bosch, Continental, Ficosa, etc.) and research organisations (VTT, INRIA, ICOOR, IKA, etc.) working together to develop a Tool Platform for embedded Advanced Driver Assistance Systems (ADAS). The DESERVE project received a positive grant decision in May 2012.

The administrative monitoring of the project is challenging due to relatively strong national consortiums, which were also considered by (Zikos & Diomidous 2012). The project has two level steering groups: country-based and the international group. One additional challenge is that the national funding decisions have been made at different times and, therefore the coordinator role of the project was changed to VTT instead of the original idea which was Fiat. Fiat was also the project drafter, and still has the most significant role in the project.

B. *Project steering group composition*

The project steering group represents a good mixture of academic and industrial partners. The project coordinator and chair of the steering group is VTT from Finland. The coordinator is in charge of all administrative work and communication with the project's international funding organisation (Artemis-JU). In addition, Technical Manager (Technolution B.V., the Netherlands) was selected to supervise the technical quality and progress of the work packages. Technical Manager also belongs to the project steering group, as Fig. 4 shows.

The project was divided into 8 sub-projects and the leading partner was nominated to follow the technical progress and resource allocation of the work packages. All sub-project leaders are also members of the steering group.

- SP1 Requirements and Specifications: Daimler
- SP2 ADAS development Platform: INRIA
- SP3 Driver behaviour - HMI: ICOOR
- SP4 Test Case Functions: Bosch
- SP5 Integration and Tests: CRF
- SP6 Validation and Evaluation: CRF
- SP7 Dissemination and exploitation: ReLab
- SP8 Project Management: CRF

In addition the project includes two supportive functions:

- Quality manager: ICOOR
- IPR manager: CRF

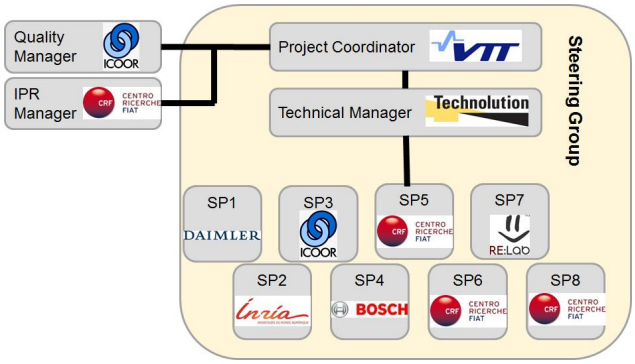

Fig. 4 DESERVE project steering group composition

C. *Project communication plan*

Awareness of project content, as well as of intermediate and final results, has a crucial significance for a project's success. This is even more valid for DESERVE, since it is mobilizing a relevant amount of resources to achieve quite ambitious and important results.

Moreover, due to the innovative nature of the platform to be developed in DESERVE, the success of the project will also depend on the public and regulatory acceptance of the DESERVE platform itself and associated methodologies. For this reason, it will be fundamental to share information and to disseminate to the widest audience the project's objectives, results and achievements during the project life.

Dissemination activities have always been considered of primary importance for the DESERVE consortium, since only if the achieved project's results are widely communicated to the public can the impact of the project be meaningful: Dissemination activities focus on the extent to which the experiences, results and achievements in general that are gained within DESERVE can be utilized by other organizations and individuals interested in the ADAS domain.

Dissemination activities have been carefully selected and planned since the beginning of the project in order to maximise the efficiency of the resources employed to this activity. The planning was done through the "Dissemination plan" document, which was planned to be issued at the beginning of the project and to be updated during the project's life time.

The dissemination plan addresses the following entities within DESERVE:

- The European Commission: Provide a clear overview of the dissemination activities carried out inside the project.
- Sub-Project Leaders: Provide a common base to harmonise their dissemination and communication effort.
- Steering Committee, Project Management: Provide an overview of activities, tools and procedures on dissemination and communication.
- Consortium: Provide a base to harmonise their individual communication activities – intended as

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internal and external – and keep the whole consortium up–to-date on progresses and results. Provide procedures to be followed for all dissemination and communication activities.

ICOOR, as the DESERVE Quality Manager, is in charge of the coordination of activities required for disseminating target project results to stakeholders. Responsibilities of the Dissemination Manager include i) defining a dissemination plan, ii) managing an operational plan for dissemination activities, iii) soliciting and coordinating with project partners for collecting contributions, iv) organizing workshops and dissemination events (with direct support of project partners); supporting partners in presenting the project in different contexts (scientific and business events), v) producing material and spreading it through the website, newsletters, articles, and other dissemination material and tools.

It is important to mention that particular attention is paid to interaction with stakeholders: DESERVE will organise three major workshops at early/intermediate/final stages of the project. They will involve major actors from OEMs, suppliers, research institutes, public authorities, user representatives and other stakeholders from different European countries. These events will focus not only on the dissemination but also the evaluation of the concept, vision and preliminary outcomes of the DESERVE project.

D. Improved cooperation between line organisation and project management

One of the outcomes of VTT's internal project survey is that co-operation between line organisation and project manager is sometimes challenging. The main issue is not personal relationships, but the problem is that the line managers do not have a sufficient amount of time to support project managers in their duties. Therefore, project managers feel they are on their own when encountering problems. On the other hand, at the same time line managers are worried about the balance of the resource allocation in their department and expect better communication in order to adjust resources between project portfolios.

VTT decided to try a new way of dividing management work in the DESERVE project which was categorised in the demanding class. One more experienced project manager took over the role of being VTT's steering group representative and also coordinator of the whole consortium. The young talent was nominated to be project manager who is in charge of steering all technical and internal administrative work. During vacation periods one of them took over both the roles.

The trial has been successful so far since both steering group representative and project manager have a person to turn to in all cases when support is needed. This also responds to the problem raised by Gerbault [13], namely that someone should have the big picture in mind in the project and some other people should focus more on details and technical challenges.

V. Discussion

Managing and working in the international consortiums in order to have common business benefits is challenging since all partners also have their company interests. The international projects are not traditionally the best alternatives to start learning the management procedures in projects. However, experience from DESERVE of having both senior people in the project steering group and an internal/technical project manager working together is encouraging. The benefits can be summarised as:

- mentoring young talents to be in charge of managing the projects
- minimising the company risk due to experience of the senior manager
- internal communication channel to the company top management
- new challenges for young professionals without leaving them to deal with the problems on their own

The main benefit gained from the DESERVE experiences is clarification of the expected business benefits. VTT as the biggest Northern European applied science research organisation executes annually about 4,200 projects. VTT belongs to the administrative sector of the Ministry of Employment and the Economy which has given it the mission "to produce research and innovation services that enhance the international competitiveness of companies, society and other customers". The feedback from the project manager has been that ownership of the project is not clear, which also influence to strategy implementation of organisation. VTT's strategy is realised with a project due to its nature of being a project-based organisation. If the ownership and business benefits are not clear, people cannot align the project to the company level strategy.

The large international project has certainly not been an ideal starting point for a young project manager to begin learning project management. However, having worked earlier on large EU projects and thus gained experience from them is undoubtedly an asset. However, due to the previous main role as a working member, the knowledge gained from the administrative and management side of the projects has remained scarce and perhaps insufficient when faced with the role of a project manager. Having earlier led some smaller project or a work package of a larger project would most likely have been helpful and built self-confidence in one's own work and decisions.

Starting as project manager of the DESERVE project has been somewhat confusing since the project had been prepared by others. Becoming familiar and gaining the experience of project management with the project and finding out what VTT's role and tasks in it are has taken some effort. Also, dividing and defining the tasks of the trainee project manager

and the senior steering group representative could have been more clearly discussed at the beginning. Nevertheless, having a senior mentor has been an advantage. When one is faced with a problem, it has been very easy to go and ask one's mentor how it should be dealt with. Overall, discussing the project issues with someone who is as familiar with the project as oneself has been rewarding and a relief.

VI. Conclusions

One of the results concerning strengthening the collaboration between project managers and line management is the introduction of the internal steering group for EU funded projects. The unofficial steering committee is a kind of support group for project managers, so that they do not feel alone if problems arise. On the other hand, the support group is represented by people from the line organisation which enables a stronger connection to monitor the fact that internal strategic guidelines are followed properly at the project level.

The other major conclusion of the internal project review study was that the project owners have too many projects to follow, which limits their time only to the key projects, which represent only about 10% of the whole project portfolio, leaving too many projects without attention. Consideration has been given to changing over to sharing project ownership with a larger number of managers in order to improve the situation and achieve better portfolio management.

In order to obtain more business benefits from the project, proper communication and dissemination have been under special attention in the experimental DESERVE project. Even if this is not directly reported in the steering group study, the indirect message is that the steering group is responsible for taking care that the project results are well communicated both internally and externally.

The ownership study indicated that the overall situation is relatively good, but also that some remarks concerning improper communication and the unclear responsibilities of these representatives emerged. In fact, in 29% of the cases the steering group did not exist at all, which raises the question of who is able to make decisions concerning deviations in the project plan and monitor the business benefits of the project. In some cases the project was so small that the customer's contact had a mandate for decision-making by himself, without an official steering group meeting.

Some of the results of the project ownership study have already been deployed experimentally in the DESERVE project, and now further steps are under consideration. VTT is investigating its current operation model, and one these topics is addressing project ownership and project management procedures in order to improve exploitation of the project outcomes, boost competence development and improve customer satisfaction.

VII. Acknowledgements

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Forecast of indicators used to assess and evaluate construction market in Romania and their evaluation

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Abstract — In this study were created using several econometric models which will predict trends construction market in Romania. The results of this research were analyzed using indicators that measure the accuracy of these predictions. The results show that models that do not have high complexity have a higher accuracy than complex models.

Keywords—component; formatting; econometric model forecasting time series forecasting accuracy, the construction market

I. INTRODUCTION

GDP growth in 2012 was driven significantly by the increase in the workload and, consequently, the gross value added of sectors: professional, scientific and technical activities, administrative services and support services (+7.9 %), real estate (4.7%), information and communication (2.0%), arts, entertainment and recreation, repair of household goods and other services (2.4%), trade wholesale and retail, repair of motor vehicles and motorcycles transportation and storage, hotels and restaurants (1.5%) and construction (+0.7%).

For this analysis we used macroeconomic indicators and indicators specific bank construction market. At the end of this research we used a sensitivity analysis that uses more forecast error indicators measure to highlight the accuracy of the results of these forecasting models. The most common measures of prediction error in practice are, Bratu (2012):

- Square root-mean-square error Root Mean Squared Error (RMSE);
- Mean average error-error (ME);
- Mean absolute error, mean absolute error (MAE);
- Theil's U statistics.

At the end of calculating these indicators measure forecast error analysis was made to highlight their comparative behavior these different perspectives and forecast models to determine how effective the chosen model.

II. METHODOLOGY

Each economic process unfolds over time, so development and growth are interpreted having this on mind. Projection of economic variables on the time axis creates a means of investigation of the dynamic time series. These are research tools based on series of distribution. Time series are presented as a sequence of real values:

$$y_1, y_2, \ldots, y_k \quad k \in \mathbb{R}$$

Where y_k represents the Y characteristic level at a time or for a period of time denoted by t and k is the number of terms in the series.

In the analysis of the data series was established a link between the indicators used in assessing the real estate market in which was used quarterly time series for the period 2007-2011. Data series were seasonally adjusted using the method of moving averages implemented in EViews. Data up to 2011 were used for the construction of econometric models by simulation through strap are boot parameters, selecting a number of 10,000 replications with resampling residual variable. Quarterly data from last year were used for the ex-post accuracy of forecasts based on econometric models. We used different notations:

gdp - gross domestic product-GDP; *pibc*- construction, gross domestic product; *ic*-, *rd*- rate monetary policy, instead, the number of dwellings completed; *aut* - which is equivalent to the number of permits the construction.

In order to analyze the links between these macroeconomic indicators presented in the table above, it is necessary, in a first step of this approach, to identify a number of features aimed at the development of each size considered in the period under review.

A. Stationary time series

A time series is stationary if the mean and variance do not vary systematically over time. Failure inpatient regressions lead to the inefficient parameter estimation is followed by predictions as a confidence level.

After applying, the Phillips Perron test revealed that the series no. construction, construction GDP in comparable prices, real interest rates, GDP in comparable prices are stationary, because, as shown in the following table, the PP statistic is less than the critical values at different levels (one %, 5% or 10%). Construction cost index series is non-stationary, stationary state being achieved by differentiation of order 2 and the resulting variable d2_ic. Number of building permits series is non-stationary, stationary state being achieved by differentiation of order 1, where was marked d_aut variable.

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TABLE I. PHILLIPS-PERRON TEST TO CHECK THE STATIONARY OF THE DATA SERIES

Variable	*Model with trend & free time*	*Model without trend & free time*	*Model with constant*
d2_ic	PP= -5.149415 1%, 5%, respectively 10% critical values: -4.6193 -3.7119 -3.2964	PP= -5.364172 1%, 5%, respectively 10% critical values: -3.8877 -3.0521 -2.6672	PP= -5.566751 1%, 5%, respectively 10% critical values: -2.7158 -1.9627 -1.6262
Loc	PP= -4.666863 1%, 5%, respectively 10% critical values: -4.5348 -3.6746 -3.2762	PP= -2.662268 1%, 5%, respectively 10% critical values: -2.6968 -1.9602 -1.6251	PP= -4.753948 1%, 5%, respectively 10% critical values: -3.8304 -3.0294 -2.6552
Pibc	PP= -5.059481 1%, 5%, respectively 10% critical values: -4.5348 -3.6746 -3.2762	PP= -2.545634 1%, 5%, respectively 10% critical values: -2.6968 -1.9602 -1.6251	PP= -5.065676 1%, 5%, respectively 10% critical values: -3.8304 -3.0294 -2.6552
Pib	PP= -6.951421 1%, 5%, respectively 10% critical values: -4.571559 -3.690814 -3.286909	PP= -2.69946 1%, 5%, respectively 10% critical values: -1.961409 -1.606610 -2.046578	PP= -3.751905 1%, 5%, respectively 10% critical values: -3.857386 -3.040391 -2.660551
Rd	PP= -4.571559 1%, 5%, respectively 10% critical values: -1.758757 -3.690814 -3.286909	PP= -2.699769 1%, 5%, respectively 10% critical values: -0.451949 -1.961409 -1.606610	PP= -3.857386 1%, 5%, respectively 10% critical values: -3.040391 -2.660551 -1.059920
d_aut	PP= -3.885282 1%, 5%, respectively 10% critical values: -4.616209 -3.710482 -3.297799	PP= -3.992245 1%, 5%, respectively 10% critical values: -2.708094 -1.962813 -1.606129	PP= -4.067445 1%, 5%, respectively 10% critical values: -3.886751 -3.052169 -2.666593

B. Econometric Modelling

Next introduce several types of models that can be applied to forecasting market variables estate. Therefore we will analyze several econometric models and time series, and combinations of these models. For each model we did a short overview.

Since econometric models for use in our research is the development of forecasts, will choose the type of econometric models on the lag, ie delayed or staggered variable.

It will highlight some econometric models that we analyze and predict market indicators estate.

Model 1: The first is an econometric model to present evolution in construction costs we index taking into account the evolution of the number of completed dwellings and construction GDP. Given that we have available as finite data sets will choose the resampling estimation coefficients boot strapping residues and no. 10000 replication.

$$D2\_IC(t) = a + b\ LOC(t-2) + c\ PIBC(t-2) + \varepsilon_t \quad (1)$$

Model 2: differentiated series of the number of building permits have set a valid lag model, which takes into account GDP growth in construction in the past. The coefficient of this variable is statistically significantly different from zero.

$$D\_AUT(t) = a + b\ PIBC(t-1) + \varepsilon_t \quad (2)$$

Model 3: We proposed a simultaneous equations model, in which the first equation explaining the number of completed dwellings in the interest rate and GDP in the same period of construction.

$$LOC\ (t) = a + b\ RD\ (t) + c\ PIBC\ (t) + \varepsilon_t \quad (3)$$

$$RD\ (t) = a + b\ RD\ (t-1) + \varepsilon_t \quad (4)$$

$$PIBC\ (t) = a + b\ RD\ (t-1) + c\ PIBC\ (t-1) + d\ PIB(t-1) + \varepsilon_t \quad (5)$$

Model 4: differentiated series construction cost index was developed as a model ARMA (Shaarawy & Broemeling, 1985). Based on the Akaike Information Criterion (AIC) to selectable best model, a model is MA (1):

$$D2\_IC(t) = a + MA(1) + \varepsilon_t \quad (6)$$

Model 5: An ARMA model was built for the number of dwellings completed, the values of Prob. the ratios are lower than the threshold of 0.05.

$$LOC\ (t) = a + b\ AR(1) + c\ MA(2) + \varepsilon_t \quad (7)$$

Model 6: GDP has developed a construction model is MA (1) for the normality assumptions are met, and non-autocorrelation homoscedastic errors.

Dependent Variable:

$$PIBC\ (t) = a + MA(1) + \varepsilon_t \quad (8)$$

Model 7: rate was selected model AR (1) they satisfy the classical assumptions non autocorrelation, homoscedastic and normality of errors.

$$RD(\ t) = a + AR(1) + \varepsilon_t \quad (9)$$

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Forecasting method is the econometric models developed for various macroeconomic indicators. Forecast horizon of one year, covering the quarter 1:2012 - 4:2012 quarter.

Projections for the number of housing are based on ARMA model incorporating data series previously forecasted value estimating again ARMA model. Forecasts for quarters 3 and 4 of construction cost index are considering no housing and construction GDP forecast based on ARMA models.

Theil's U statistic is calculated in two by the Australian Treasury in assessing the accuracy of forecasts.

Use the following notations:

a- Actual results; p- Expected results; t- Time reference; e- Error (e=a-p); n- Number of periods of time.

$$U_1 = \frac{\sqrt{\sum_{t=1}^{n} (a_t - p_t)^2}}{\sqrt{\sum_{t=1}^{n} a_t^2} + \sqrt{\sum_{t=1}^{n} p_t^2}} \quad (13)$$

TABLE II. FORECASTS BASED ON ECONOMETRIC MODELS DEVELOPED (T1: 2012 - T 4:2012)

Quarter	Forecast rd (%) (model AR (1))	Forecast pibc (comparable prices) (model MA (1))	Forecast number of completed dwellings (model ARMA (1,1))	Forecast Construction Cost Index (model with lag)	Forecast no. building permits (model with lag)	Forecast number of completed dwellings (simultaneous equation model)
2012:T1	4.1	6334.66	26151.42	96.8	1759.92	26120.34707
2012:T2	4.1	13170.31	33113.54	103.1	2427.09849	36569.67334
2012:T3	3.9	15036.45	38051.28	101.9	1601.283511	34169.98545
2012:T4	3.9	18337.83	41553.28	102.3	1764.160651	33371.79585

C. Econometric Modelling

If we consider the forecast over k at the reference period t, the corresponding error next time (t + k) is. The most common measures of prediction error in practice are, Bratu (2012):

Square root-mean-square error Root Mean Squared Error (RMSE):

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n} e_t^2(T_0 + j, k)} \quad (10)$$

Mean error, mean error (ME):

$$ME = \frac{1}{n}\sum_{j=1}^{n} e_t(T_0 + j, k) \quad (11)$$

The sign of the indicator, according to Bratu (2012 b) provides important information: if it has a positive value, then the current value of the variable that has been underestimated, which means average values predicted too small. A negative value of the indicator shows the expected values too high on average.

Mean absolute error (MAE):

$$MAE = \frac{1}{n}\sum_{j=1}^{n} \left| e_t(T_0 + j, k) \right| \quad (12)$$

$$U_2 = \sqrt{\frac{\sum_{t=1}^{n-1} \left(\frac{p_{t+1} - a_{t+1}}{a_t}\right)^2}{\sum_{t=1}^{n-1} \left(\frac{a_{t+1} - a_t}{a_t}\right)^2}} \quad (14)$$

If U2 = 1 => no differences in terms of accuracy between the two predictions that are compared; if U2 <1 => foresight compared is greater accuracy than the naïve; if U2> 1 => foresight has a degree compared to less accuracy than the naive.

Naive forecast values are considered to be the current recorded in the previous period. WEIGHT is used both to compare methods of prediction applied to a given set of data, and to compare the accuracy of the forecast number series. If scaling error is less than 1, compared to the forecast is better than the reference (naive forecast).

TABLE III. INDICATORS FOR ASSESSING THE ACCURACY OF FORECASTS BASED ON ECONOMETRIC MODELS

Measure accurately	Forecast rd (%) (model AR (1))	Forecast pibc (comparable prices) (model MA (1))	Forecast number of completed dwellings (model ARMA (1,1))	Forecast Construction Cost Index (model with lag)	Forecast no. building permits (model with lag)	Forecast number of completed dwellings (simultaneous equation model)
ME	1.9875	-1112.2930	-24075.8800	7.8242	2264.8010	-21916.4504
MAE	1.9875	3147.0231	24075.8800	7.8242	2264.8010	21916.4504
RMSE	2.0553	3197.1554	24266.5140	9.1206	2342.8412	22252.6320
U1	0.0617	**0.0578**	0.2618	**0.0222**	0.1911	0.2532
U2 (MASE)	2.5544	**0.8955**	6.1228	1.8787	1.3941	5.5606

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III. CONCLUSIONS

There is a persistent overestimation of the number of dwellings in the use of model ARMA (1,1) and a simultaneous equations model in forecasting. This overestimation suggests that the patterns have been taken into account structural shocks. Interest rate and construction cost index is a tendency to underestimate, as indicators of ME and MAE have the same value. RMSE indicator values are higher for all types of predictions versus ME and MAE.

The highest degree of accuracy we were forecast for the construction cost index, with a value of 0.0222 for U1 indicator, and the lowest number of dwellings have predictions based on a model ARMA (1,1). Except forecasts GDP in construction, all other predictions have a lower degree of accuracy than naive forecasts.

Therefore, for most macroeconomic indicators analyzed, a hypothesis is verified and checked frequently in the literature, especially for the exchange rate, ie, predictions based on simple econometric models have a higher degree of accuracy than using complex patterns .

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The Influence of Leadership Styles on Organisational Performance Mediated by Organisational Innovation: A Case Study of the Hospitality Industry in Thailand

Vissanu Zumitzavan and Sarinthree Udchachone

Abstract**—**This paper examines the relationship between the demographics of respondents, leadership styles, organisational innovation, and organisational performance, and discusses which styles of leadership are supportive to business. The research sampled 419 managers by survey questionnaire; in analysing the data, the statistical technique of hierarchical multiple regression was applied. Results show that leadership styles do have an influence on organisational performance. In addition, they indicate an association between leadership styles and organisational performance,mediated by organisational innovation.

Keywords**—**Human Resource Management, Leadership Styles, Organisational Innovation,Organisational Performance

I. INTRODUCTION

The success of an organisation in the age of the dynamic marketplaceis solidly connected to how innovative executives manage in the digital economy. Hagen and Lodha [1] endorsed the importance ofmanagers' contribution in the highly competitivecontext of globalisation. Currently, academic researchers are suggesting that innovative organisations require innovative managers, whilst organisational innovation calls for invention, investigation and evaluation [2-4]they are also interested in the relationship between the role of leadership and the factors influencing organisational performance through organisational learning and organisational innovation.

Therefore, scholars have proposed the concepts of organisational learning to enhanceperformance [5, 6] in which managers encourage a learning environment within their organisations; knowledge needs to be distributed throughevery level of the organisation. In addition, in Small Business Enterprises (SMEs), managers are the key persons making day-to-day decisions, considered the most imperative drivers of success in enabling firms to achieve their organisational goals [7-9]. This confirms that the decisiveness of the manager is an essential contribution towards organisational success [10]. Furthermore, Daft [11] emphasised that leadership is one of the most significant aspectsin organisations seeking to transform themselves through organisational learning, with the purpose ofencouraging organisational innovation. Similarly, Handy[12]stressedthat managers play an important role in contributing knowledge and encouraging a learning environment in the organisation.

Hotels can be classified as a sub-category of SMEs, and the leadership of hotel managersis confirmed as a core competency in the hospitality industry [13]. The interconnections between leadership styles, organisational innovation and organisational performance the can be developed. Moreover, current academic researchers have found that different leadership styles may lead to different levels of organisational performance [14, 15]. At the same time, Mabey and Ramirez[16] proposed that different leadership styles cancreate different levels of organisational innovation.

More explicitly, scholars have indicated that leadership styles andinnovation are important and interrelated variables contributing to organisational performance. Since appropriate leadership styles canlead to the creationofinnovation within an organisation, maintaining customer satisfaction, there is a critical need to examine these relationships [17-19]. Leadership can be observed as a part of learning processes taking place through carrying out day-to-day responsibilities, and in turn influencing the creation of innovation and leading to an increase in organisational performance[16].Hence, adopting appropriate leadership styles can help to encourage learning in the organisation and this can lead to innovation and improvement in employees' skills, which in turn can improve organisational performance overall.

II. RESEARCH BACKGROUND

The unit of study of this research is hotels in the hospitality industry in Thailand. Statistics from theBank of Thailand and Ministry of Commerce [20, 21] show that the service sector represented approximately 52.3 per cent of the Gross Domestic Product (GDP) in 2012, clearly the largest sector [20, 21].The growing numbers of tourists travelling all around the world will be boosted in Thailand by the *ASEAN Economic Community (AEC)*event in 2015. This increase in thenumbers of inbound tourists visiting Thailandimplies further growth in the service sector. Hence, for the development of organisations within the hospitality industry, how to meet customers' expectations must be understood.

According to the Resources Based View (RBV), internal capabilities enhance competitive advantage and performance. For example, Helfat and Raubitschek[22] found that a system of knowledge and learning increases competitive advantage through innovation and strategic

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linkage of products. More specifically, an emerging source of competitive advantage for service industries includes notions, skills and attitudes of their organisational members. Certainly, development of a 'service quality' culture accounts for significantincrease incompetitive advantage in service organisations;this results from the practice of best training in human resource management (HRM) and from a strategic approach to implementation. Contributions from HRM are seen as theorigin of competitive advantage. Helfat and Raubitschekalso suggested high-performing service organisations actively engage in best practice across the areas of recruitment and selection, training and development, communication and team working [23]. Similarly,López- Gamero et al.[24] found that the hospitality industry, and especially the hotel sector, acquires competitive advantage through innovation. Their studies proved that organisations' resources and competitive advantage act as mediator variables for a positive relationship between environmental protection and financial performance.They also suggestedthat uncontrollable variables such as environment may influence levels of overall organisational performance.

Georgellis et al.[25] suggested that organisational innovation helpsto contribute products and services, and is closely related to maintaining competitive advantage. Even though the system may be restricted by managers' prior experience, Brush and Chaganti[26] emphasise that managers' human capital is expanded through the introduction of systems of organisation. These systems might beadopted from formal training to address specific problems such as quality, or from customers or business support agencies, or from specific techniques such as HRM policies [27]. For example, the emphasis of organisational innovation such as changing the way people work, is on producing goods and services different from those of competitors. For example, Microsoft Australia emphasise values such as self-directed teamwork, information sharing, risk-taking, experimentation, tolerance of non-critical mistakes, tolerance of ambiguity and uncertainty as the tasks change rapidly, and a strong orientation towards the marketplace and clients [28].More specifically, Hofstede[29] found that Thailand is one of the countries in which managers of SMEs can be classified as 'collectivist' as they are likely to work as a team; they favour 'high uncertainty avoidance' as they are not likely to take risks in business matters, and 'high power distance' as they tend to respect others according to hierarchical authority and seniority. This suggests that managers in different areas and types of business may have different management styles, including different ways of applying and encouraging predominant leadership styles and organisational innovation. Hence, it may be useful to study hotel managers in Thailand.

One of the challenges in the tourism and hospitality industry is that it is a people-business relationship requiring a large number of organisational members with innovative competencies to reach customers' needs [30]. This recognition is particularly relevantin Asia, where regulations are not as stringent as in other developed economies[30]. Shaw et al.[31]envisaged that in 2017 the greatest number of employees in the travel and tourism industry would be in Asia: China, India, Japan, Indonesia and Thailand respectively [30]. This clearly shows that Thailand is making the most ofbusiness opportunities in the service sector under the AEC. Thai businesses have good prospects following the gradual reduction in goods, services and trade facilitation, although the pace of liberalisation is slower than expected [32].

A. Originality of the Research

This research aims to investigate the relationship between demographics, leadership styles and organisational performance which may be mediated by organisational innovation. In particular, the unit of study is hotels in Thailand which has not previously been studied. Hence, the findings of this research can contribute to the body of knowledge for bothacademic researchers and practitioners.

B. Research Conceptual Framework

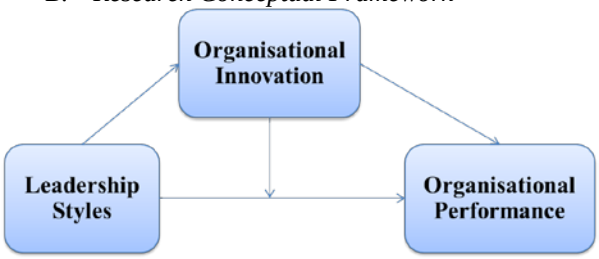

Fig.1 Research Conceptual Framework

Independent variables: The demographics of managers, number of employees and leadership styles. At the same time, the levels of innovation created in each organisation were investigated.

Dependent variable: Organisational performance; the manager of each hotel was asked to evaluate their financial performance compared with other hotels in their sector.

Figure 1 illustrates the connection between leadership styles, innovation and organisational performance. These concepts are applied to explain the association between leadership styles, organisational innovation and organisational performance, given the unit of study, hotels and their survival in contemporary business in Southeast Asia, especially in Thailand. More specifically, in view of the forthcoming AECevent of2015, consideration is focused on the continually growing numbers of tourists travelling all around the world. Hence, how to meet customers' expectations may be needed for the development of organisations.

III. Related Literature

Macpherson and Holt [33]found that in small firms like those in the hotel industry, resources are indispensable for opportunity recognition and innovation, while managerial resources are necessary to provide systems and processes to facilitate opportunity exploitation. So, development may be associated with the

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procedure through which knowledge is attained and implemented. Thus, the possession of knowledge may characterise the level of organisational performance[34]. Macpherson and Holt [33]studied the relationship between the transition of knowledge and organisational performance. They found that the capabilities of the managers, their role in creating the organisation, or their relationship to their network, may affect the translation of knowledge into organisational performance. They considered managers' capabilities as acquirable assets whose ownership has a fundamental influence on organisational performance (i.e. subjective versus objective measures, see for example, [14, 15, 35, 36]).

Different traits of managers (i.e. gender, age, experience, and education) may lead to different levels of organisational performance. Although a variety of leadership concepts have been introduced [37], Burns[38]proposes that the most promising are transformational and transactional leadership. He suggests that transactional leadership is more commonplace than is transformational leadership, if less dramatic in its consequences. Bass [39],however, further develops the concepts of transactional and transformational leadership. He recognises them as two discrete theories and distinguishes their different features [40]. Bass [41] proposes that transformational managers are likely to make their employees trust, respect, and admire them by focusing on idealised influence, individualised consideration and inspirational motivation which, in turn, impliesthat they serve as a charismatic role model and express a creative vision. This style of leadership also suggests a need for intellectual stimulation, defined as questioning formerassumptions and the status quo[42].The transformational leadership style describes managers who tend to focus on higher motivation development and motivate their subordinates by inspiring them with a vision of the future [43].

Transformational leadership is composed of the following:

- inspirational motivation: providing followers with a sense of meaning and challenge in their work;
- intellectualstimulation: encouragingsubordinates to question assumptions, discover new ideas and methods, and develop new perspectives;
- idealised influence: behaviours that subordinates attempt to follow; and
- individualisedconsideration: special consideration to each subordinate's needs for accomplishment and progression.

However, it has also been recommended that transactional leadership has a positive correlation with organisational innovation and organisational performance[44]. It can be found that in the service industry, the manager of the hotel needs to emphasise his/her vision and focus on customers and employees as individuals. Similarly, researchers haveestablished that there is a strong correlation between transformational and transactional leadership and a lower rate of turnover, higher levels of organisational performance and greater customer satisfaction [45].

As in the US economy, almost eighty per cent of Thailand's economy isservice-based, and the quality of service is a major factor in consumers' perceptions and organisational performance[46]. In order to offer a high-quality service, Dong et al. [47]recommendedthat firms should concentrate on research and development as a core component of their strategies. Those organisations are on the leading edge of product development or service, and their capability to innovate and introduce new products or services is a new success factor. Innovation has become the most important factor in satisfying demanding consumers in today's technological world. Ford and Evans [48]also found that organisational innovation could lead a business to greater levels of performance. However, organisational innovation is no longer strictly the purview of research and development departments; it is imperative for all characteristics of a business and all processes [25]. For example, the Malcolm Baldrige National Quality Award concentrates on leadership and recognises it as a factor of performance excellence. Similarly, [49] highlight that Motorola's former CEO, Bob Galvin, made a habit of making quality the first item on the agenda of executive staff meetings, leaving the meeting before discussion of finance. If quality were taken care of, financial performance would follow. His leadership guided Motorola to become one of the first winners of the Malcolm Baldrige National Quality Award[48]. Hence, this suggests that the manager can apply appropriate leadership styles, to encourage organisational innovation and in turn create higher levels of organisational performance.

A. Research Question

The research is designed to answer the question 'To what extent are the leadership styles of hotel managers supportive oftheir business through organisational innovation?' This research question was generated to investigate the relationship between leadership styles, organisational innovation and organisational performance.

IV. Sample and Data Collection

There are approximately 2,400 hotels registered in Thailand [50]. Samples were classified by the stratified random sampling method, ensuring that they were equitably selected with different locations in various provinces. Prior to conducting the questionnaire, postal letters, e-mails, and telephone calls were made to arrange the time and to ascertain that these managers were willing to participate in the survey. Respondents were assured of the confidentiality of their answers.

Questionnaires were distributed to managers of selected hotels.Thailandwas chosen to study because it is ranked by the tourists worldwide as one of the most desirable countries to visit[51]. Krejcie and Morgan's formula is commonly used todetermine sample size [52];their table shows that a population size of 2,400requiresa sample size of at least 331. Correspondingly,Ames [53]suggests that mail surveys are expected to have response rates of 11 to 15 per cent. In

this study,therefore, questionnaires were sent out to 1,000 organisations. A total of 419 completed questionnaires were received, which amounted to a response rate of 41.90 per cent. This is an extremely positive response rate, which could improve the validity of the research and generalisability of the findings. More precisely, Hair et al.[54] suggest that a ratio of 5:1 is the standard to achieve to ensure that the data collected adequately reflects the phenomenon being studied; taking into account all the independent variables, a sample that is at least one-fifth of the target population size is required. Thus, the high response rate could further contribute to the representativeness of the data collected. In this study, nine independent variables were analysed:gender, age, experience, education, number of employees, transformational leadership, transactional leadership, laissez-faire leadership and organisational innovation. In addition, to ensure reliability and validity, a pilot study was tested before conducting the actual questionnaire.

The questionnaire had four sections: demographics, leadership styles, organisational innovation and organisational performance. The first section comprised questions relating to gender, age, education and experience,withthe number of employees as a controlled variable. The second and third sections used a 1-6 Likert scale [55]where 1 was the least and 6 was the most agreed. In the last section, managers were asked to evaluate their company's organisational performance by focusing on financial resultsthrough providing a percentage score against other organisations in their sector.

V. Data Analysis and Discussion

A sequential or hierarchical analysis of a set of independent variables may often produce the coefficients necessary to answer the scientific questions at hand. In the hierarchical form, the set of independent variables is entered cumulatively in the R^2 and partial regression and correlation coefficients are determined when each independent variable joins the others [56]. A full hierarchical procedure for a set of independent variables consists of a series of regression analyses, each with one more variable than its predecessor. The choice of a particular cumulative sequence of independent variables is made in advance, as emphasised by the purpose of the research. Moreover, the researcher should be guided by the theoretical foundation that originally led to the research question [57]. The higher the correlation between the independent and dependent variables, the better prediction equation they could provide [58]. This research framework has three main groups of independent variables: Respondents' Profile and Number of Employees; Leadership Styles; and Organisational Innovation. As a result, the relationship between independent and dependent variables was tested to attain the results precisely, and hierarchical regression analysis was applied.

A. Hypotheses

H_1: Different demographics lead to different levels of organisational performance.

H_2: Different leadership styles lead to different levels of organisational performance.

H_3: Different levels of organisational innovation lead to different levels of organisational performance.

H_4: The relationship between demographics, leadership styles, and organisational performance are mediated by organisational innovation.

VI. Findings

Rather than looking for a statistical solution, the researcher should be guided by the theoretical foundations that originally led to the research question [57]. This suggests that the researcher selects the most appropriate independent variables to predict a dependent variable. Therefore, in this section, hierarchical regression analysis is performed to examine the direct effects of Number of Employees, Demographics of Respondents, Leadership Styles and Organisational Innovation on the dependent variable known as Organisational Performance. In accordance with the theoretical framework of this research, Number of Employees and a set of Demographics of Respondents (age, gender, education, and experience) were initially entered, followed by Leadership styles (Transformational, Transactional, and Laissez-faire), and Organisational Innovation. Three hierarchical regression analyses were required to test for Organisational Performance.

Table I: Model Summary (Number of Employees and Demographics of Respondents, Leadership Styles, and Organisational Innovation)

Model predictors	Sig	R^2	Adjusted R^2
Model 1: Number of Employees, Age, Experience, Gender, Education	0.000	0.112	0.112
Model 2: + Transactional Leadership, Transformational Leadership, Laissez-faire Leadership	0.000	0.403	0.291
Model 3: + Organisational Innovation	0.000	0.498	0.094

Dependent Variable: Organisational Performance

Model 1 (see Table I) with Number of Employees, Age, Experience, Gender, and Education as independent variables, has R^2 = 0.112. This means that those independent variables could explain the dependent variable Organisational Performance, approximately 11.2%. After some independent variables are added to Model 2, R^2 increases to 0.403. Model 3 clearly shows that once the Organisational Innovation is added, R^2 increases to 0.498. Hair et al. [54]recommend that R^2 is the best standard to use when comparing regression models. Therefore, it can be concluded that the set of independent variables in Model 3 is the most valuable in predicting the dependent variable.

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Moreover, the result of the R^2 change in Model 2 suggests that entering a set of Leadership Styles could help explain the variance of the dependent variable, approximately 2.91 or 29.1 per cent, more precisely, and it is also clear that a set of Leadership Styles greatly affects the variance of Organisational Performance. In Model 3, R^2 change = 0.094 or 9.4 per cent, so it could be concluded that a set of Leadership Styles is a more powerful influence on Organisational Performance than on Organisational Innovation.

H_0: $\beta_1 = \beta_2 \ldots = \beta_k = 0$, there is no significant linear relationship between the set of predictors composed of Number of Employees, Age, Gender, Education, Experience, Transformational, Transactional, Laissez-faire Leadership, Organisational Innovation and the dependent variable, Organisational Performance.

H_1: $\beta_i \neq 0$, i = 1, 2… k, there is a significant linear relationship between the set of predictors composed of Number of Employees, Age, Gender, Education, Experience, Transformational, Transactional, Laissez-faire Leadership, Organisational Innovation and the dependent variable, Organisational Performance.

The results of ANOVA show a P value of 0.000, which is less than 0.05; therefore, the null hypothesis is rejected (see Table I). It could be concluded that Number of Employees, Demographics of Respondents, Leadership Styles, and Organisational Innovation have an impact on Organisational Performance resulting in the acceptance of hypotheses 1 to 3. Once a set of independent variables has an impact on a dependent variable, the prediction equation can be ascertained.

A. Beta Coefficient

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

Where:

Y = Organisational Performance
β_i=Beta Coefficient
X_1 = Number of Employees
X_2 = Age
X_3 = Gender
X_4 = Education
X_5 = Experience
X_6 = Transformational Leadership
X_7 = Transactional Leadership
X_8 = Laissez-faire Leadership
X_9 = Organisational Innovation

B. Model Predictors

Organisational Performance =– 0.009 (Number of Employees) + 0.168 (Age) – 0.005 (Gender) + 0.075 (Education) – 0.002 (Experience) + 0.397 (Transformational Leadership) + 0.111 (Transactional Leadership) – 0.058 (Laissez-faire Leadership) + 0.322 (Organisational Innovation)

The most powerful predictor in the Standardised Coefficient Equation is Transformational Leadership (Beta Coefficient = 0.397). Thisindicates that Transformational Leadership has a positive relationship with Organisational Performance. Hence, it could be supposed that managers who have a high level of Transformational Leadership are supportive to the organisation. Organisational Innovation (Beta Coefficient = 0.322) has a positive relationship with Organisational Performance, suggesting that the managers who have encouraged a high level of Organisational Innovation are useful to the organisation. The Beta Coefficient of Age, 0.168, suggests that it has a positive relationship with Organisational Performance and that the older the managers are, the greater the performance of the organisation could be. However, the Beta Coefficient of Transactional Leadership is 0.111, meaning that Transactional Leadership is another predictor which has a positive relationship with Organisational Performance. It is almost four times less powerful to the Organisational Performance than is Transformational Leadership, and it can be supposed that managers in this category are supportive to the organisation. Similarly, the Beta Coefficient of Education is positive, 0.075, suggesting that Education is also helpful to the organisation.

In addition, the Beta Coefficient of Laissez-faire Leadership is -0.058. Thissuggests that it has a negative relationship with Organisational Performance. Hence, it could be supposed that the lower the level of this leadership style, the better the manager could perform. Next, the Beta Coefficient of Number of Employees is -0.009, suggesting a negative relationship with Organisational Performance. So, it can be supposed that organisations with a smaller number of employees may perform better than those with a larger number of employees.

Next, the Beta Coefficient of Gender is -0.005, suggesting that male managers perform slightly better than female managers; however, this is largely irrelevant when compared to other variables. Last, the Beta Coefficient of Experience is - 0.002, suggesting a negative relationship with Organisational Performance and that the manager with less experience may perform better.

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C. MediationTesting

Table II: Coefficient (Standardised Coefficients of 1st and 2nd Equations)

Variables	Standardised Coefficients (*1st Equation*)			Standardised Coefficients (*2nd Equation*)		
	Sig	**R^2**	**Adjusted R^2**	**Sig**	**R^2**	**Adjusted R^2**
	0.000	0.403	0.392	0.000	0.498	0.487
	Beta	**Tolerance**	**VIF**	**Beta**	**Tolerance**	**VIF**
Number of Employees	0.001	0.973	1.028	- 0.009	0.972	1.029
Age	0.212	0.364	2.746	0.168	0.361	2.766
Gender	-0.003	0.992	1.009	-0.003	0.986	1.014
Education	0.112	0.975	1.026	0.075	0.961	1.040
Experience	- 0.010	0.377	2.650	- 0.002	0.377	2.650
Transformational	0.454	0.482	2.074	0.397	0.474	2.108
Transactional	0.119	0.497	2.012	0.111	0.497	2.013
Laissez-faire	- 0.068	0.977	1.024	- 0.058	0.976	1.025
Organisational Innovation	-	-	-	0.322	0.912	1.097

Dependent Variable: Organisational Performance

1st Equation: Organisational Performance = α Number of Employees and Demographics of Respondents + α Leadership Styles

2nd Equation: Organisational Performance = α Number of Employees and Demographics of Respondents + α Leadership Styles + α Organisational Innovation

Hair et al. [54] strongly suggest the adjusted R^2 in comparing models with different numbers of independent variables. The adjusted R^2 is also useful in comparing models withdifferent data sets because it will compensate for the different sample size. Hence, in this research, the adjusted R^2 is considered for comparing two equations. It was found theadjusted R^2 for the second equation is 0.487, which is greater than the adjusted R^2 of the first equation, 0.392. This indicates that the set of independent variables in the secondequation explains the dependent variables more fully than the set of independent variables in the firstequation. In addition, when adding the Organisational Innovation variable into the equations, the Beta Coefficient values of the Leadership Styles variables change. This suggests that the effect of Leadership Styles on Organisational Performanceare mediated by Organisational Innovation.Hence, hypothesis 4 was accepted. It can be concluded thatthe relationship between demographics of managers, leadership styles, and organisational performance are mediated by organisational innovation.

VII. Recommendations

The results suggest that the set of predictors is statistically associated with the dependent variable. Moreover, findings indicate that managers' demographics, leadership styles and organisational performance were mediated by organisational innovation. This suggests that it may be necessary to further investigate the extent to which leadership can or cannot be trained to sustain organisational innovation. Furthermore, the findings underline the fact that transformational and transactional leadership are associated with organisational performance. Hence, organisations may need to provide leadership programmes to encourage their managers to practise the predominant components of those leadership styles (i.e. encouragementthrough both on-the-job and off-the-job training; see for example, [59]). Effective leadership can be achieved through a suitable hospitality leadership development training programme, as theresults suggestthat organisational innovation acts as a mediator. Therefore, any organisation desiring to improve its organisational performance may need to encourage its managers to maintain organisational innovation. Intrinsically, in encouraging organisational innovation, additional budgets may be required[60].

VIII. Implications and Future Research

There are several implications of these findings. First, the impact of leadership styles on organisational performance may need to be observed over a long period of time in a longitudinal study. Thus, time limitation is one of the difficulties inconducting this research.

Secondly, this research should also be conducted withemployees,who have the most influence on customers' satisfaction; and on how customers perceive the service as organisedby hotel managers and executive teams. Managers' perspectives of leadership styles, organisational innovation and financial performance may not be adequate to fully explain the environment of the hotel industry overall. However, the different perceptions ofemployees and customers may lead future researchers to attainmore insightful information. Thirdly**,** within a service industry, it appears that customer orientation is important in increasing a hotel's performance. Tajeddini and Trueman[61] highlighted 'putting the customers' interests first' to achieve long-term profits. Therefore, although it is essential to recruit well-qualified and experienced managers and employees [62, 63], this study may not have fully revealed whether the respondents are

well-trained, with wide experience in the hospitality industry. In terms of education, it is likely that managers with higher levels of education are better equipped to understand the meaning of customer orientation, as well as being able to put innovative ideas into practice.

Fourthly, as this study relies on the quantitative approach, it may not fully allow for a complete understanding of complex relationships in the organisation. More importantly, the study focuses on a cross-sectional sample of one specific business type, hotels in the hospitality industry, which limits the degree to which the researcher can make causal references regarding hypothesised relationships. Hence, it is essential to complement the quantitative methodology with qualitative methods, for instance in-depth interviews.

Finally, Krull et al.[64] emphasised the importance of cultural differences. For example, an investigation of Korean managers suggested that, contradictory to the self-serving bias, they are likely to accept responsibility for organisational members [65]. The attribution theory was largely based on experiments with US and European organisations [64, 66], while the Korean study recommends paying attention to building attribution theory predictions in non-Western societies, especially in countries with strong collectivist traditions. This is obviously consistent with the study of Hofstede[29], which suggested that Thai managers are more likely to be collectivist, with high uncertainty avoidance and power distance. This indicates that a repetition of this study in different areas and industries may be useful to acquire more in-depth understanding of the attributes of managers in different cultures.

IX. Conclusion

This research explains the relationship between the demographics of managers, leadership styles, organisational innovation, and organisational performance. The findings suggest that transformational and transactional leadership are supportive to the organisation. In addition, organisational innovation acts as a mediator between the demographics of respondents, leadership styles and organisational performance. Hence, the empirical findings suggest that the set of predictors in this research can act asguidelinesfor managers to improve organisational performance overall.

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A CRITICAL REVIEW OF INTEGRATED PROJECT MANAGEMENT FOR CONSTRUCTION SUSTAINABILITY

Menoka Bal, David Bryde, and Edward Ochieng

Abstract— Achieving sustainability related targets is becoming a key performance driver for organizations involved in construction projects. Sustainability is a big concept in a construction project and a construction project is full of different stakeholders. This paper sets out a conceptual theory showing how the stakeholder management strategies are integrated with value and risk management processes can enhance sustainability. This paper will evaluate the different approaches for engaging the stakeholders through analyzing 16 interviews. In sustainable development projects, some stakeholders are really important, but there are some others whose absence from the usual decision-making processes may even bear inconsistent environmental, social and economic issues leading to unbalanced outcomes. The paper posits that value management and risk management processes are an effective way of engaging the stakeholders and ought to be integrated with formal stakeholder management activities. Through in-depth analysis, this paper aims to develop an approach of stakeholder engagement process that is most appropriate for sustainability assessment.

***Keywords*—** Construction Sustainability, Stakeholder Management, Risk Management, Value Management

I. Introduction

The theory that underpins this paper is that by integrating processes for the management of projects performance will be enhanced. For example, integration means completeness and closure. The integration of an organization's individual business units has been recognized as a significant opportunity to improve firm performance, through delivering greater efficiency and effectiveness [1]. Processes are integrated for the purposes of better understanding, building and managing a wider system to create high levels of performance [2]. The immense pressure on the infrastructure means that measures must be taken today to safeguard the construction environment for tomorrow. This is the challenge the construction industry faces. The construction industry generates one-third of all waste in Britain; twenty per cent of new building materials on the average building site are simply thrown away at the end of the job; an estimated 13 million tons of new materials are thrown away every year; fifty per cent of UK GHG emissions are from running buildings; 30 present of those emissions could be cut by cheap and simple measures; ten per cent of UK emissions come from producing building materials [3]. Considering the above issues the market for sustainable buildings is increasing as the construction industry has acknowledged that they may mitigate the impact on the environment and bring significant social and economic benefits [4] – [6]. A general tenet of construction industry research is greater integration that will solve the problems caused by fragmentation and this integrated process lead to improve project delivery and put forward a framework for mitigating the obstacles [7]. The theory will be applied to the construction industry, which is one of the most dynamic, risky and challenging business sectors. It is defined as one which embraces the construction materials and products; stakeholders such as suppliers and producers; building services manufacturers, providers and installers; contractors, sub-contractors, professionals, advisors and construction clients and those organizations that are relevant to the design, build, operation and refurbishment of buildings [8]. Construction supply chains are known to be filled with non-value added activities and are continuously faced with problems caused by myopic control [9]. Construction project's risks and disruptions consist of supplier failure, supply interruption, communication problems, transportation and uncertain lead times [10].

In order to reduce the risks and disruptions in construction sector, stakeholder management has the potential of identifying, prioritizing, analyzing and engaging the stakeholders [11]. Integrating the concepts of stakeholder management and sustainability could help to lead construction to build a sustainable society. Risk management on the other hand assists in creating immediate value from the identification and reduction of risks. Effective management of the risks adds value by ensuring the quality, reliability, performance and other crucial factors, to meet or go beyond the customer's expectations. Male et al. [12] and Dell'Isola [13] described how value management in construction is increasingly being seen as the term to explain the overall

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process of enhancing a project value, from concept to operation, to improve the value and optimize the life cycle cost of a facility. Therefore, proactive and constructive engagement of stakeholders, as part of an integrated approach to project management including risk and value management, has the potential to deliver sustainability in construction sector. The purpose of this research is to provide a conceptual theory of integrating stakeholders, risk and value management with the goal of achieving sustainability in construction sector.

II. Sustainability in Construction

Sustainable construction is an emerging field of science that aims at incorporating the general sustainable development concepts into conventional construction practices [14]. The terms "sustainability" is most commonly associated with such concepts as 'long-term', 'durable', 'sound', and 'systematic' [15]. The fundamental concept of sustainable construction is to deliver buildings and structure that emphasize long term affordability, quality and efficiency, value to customers and users, while decreasing negative environmental impacts and increasing the economic sustainability. In one early study, Ardichvili [16] represented sustainability as an agenda that extends beyond economic viability and environmental regeneration, reaching deeply into the structure of social organization by insisting on social equity and justice. In fact, the insight of sustainable construction is the reforms of housing and planning - a new approach to how it can be built, to bring the development that meets the economic, social and environmental needs of future generations. Alkhaddar [17], outlined that sustainable construction delivers tangible benefits to the triple bottom line (TBL) that is 1) Economic Growth 2) Environmental Sustainability and 3) Ethical/Social Performance. Murray and Cotgrave [18] stated that the meaning of sustainability and sustainable development is evolving over time and commonly the terms are interchanged, as they are in this study, to broadly describe an approach that addresses the social, economic and environmental challenges mankind faces.

III. Managing the Stakeholders in Construction

In one early study, Freeman [19], defined the stakeholder in an organization as any group or individual who can affect or is affected by the achievement of the organization's objectives. According to Romenti [20], stakeholders are considered social subjects who influence each other's' perceptions, rather than isolated individuals who process information. Successful completion of construction projects is therefore dependent on meeting the expectation of stakeholders [21]. If the concepts of stakeholder management and sustainability are integrated, this could help to guide organizations towards promoting a sustainable society [22]. Project stakeholders are defined as, individuals and organizations who are actively involved in the project or whose interests may be affected by the execution of the project or by a successful project [23]. The conception of stakeholder has taken on greater importance due to public interest, greater coverage by the media and concerns about corporate governance [24]. Stakeholder management can make vital contributions to generate value all the way along the supply chain through its impact on the activities of construction industry [25].

Effective stakeholder management is crucial to project's success and it's really impossible to manage stakeholders if it's not known that who they are and what the motive of their involvement. Stakeholder can be classified according to their interest and power. Identifying stakeholders relative to their level of interest and power, provides an opportunity to bring those stakeholders within the judgment process who might have interest and authority to bring sustainability related performance and who might have interest in different sustainability related issues as well. It is necessary for organizations to identify and address the needs and interests of their various stakeholders to receive their continued concern and support to the organization. As most of the stakeholder's demands and interests sometimes conflict with each other, organization must set appropriate strategic goals and priorities to bring sustainability to meet these demands and interests. The necessities of stakeholder group signify the group's interests that need to be managed by organizations. Accordingly, the extent to which management recognize their responsibility to meet and satisfy the needs and demands of their stakeholders' interests have direct effects on their overall corporate sustainability [26]. Relating stakeholder's interest and their influence to the target of achieving sustainability, influence the project and its outcomes is extremely useful in identifying the significant stakeholders with their issues and also help to prepare strategies to address these issues.

In order to manage the construction stakeholder's such as owner, contractor, sub-contractor, construction clients, project manager and architects; stakeholder analysis can be used to identify the key people who have to be won over, according to their interest and power. However, Newcombe [27] pointed out that different stakeholders have different levels and types of investment and interest and can be seen as multiple clients or customers for the project in which they are involved. If their interest could not be met up finally it will jeopardize the project objectives and its smooth implementation. As well as, different stakeholders show their positive or negative views and sometimes differ with one another through challenging to settle their varied viewpoints. As a stakeholder management approach assist to make partner and maintaining good communication, it helps the project participants to work together. Therefore most improvement actions were focused on increasing customer satisfaction. The aim of organizational sustainability will be accomplished if the organization can continue to meet the wants and expectations of the stakeholders [28]. Lots of construction disputes and conflicts could be kept away from the organization if a communal stakeholder management approach is adopted by the parties. Stakeholder management is a proactive approach that stops things going wrong in the first time.

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IV. RISK MANAGEMENT SUPPORT IN ACHIEVING SUSTAINABILITY IN CONSTRUCTION

Investigating and managing risk in construction is important to manage the project successfully. It also helps to avoid or limit risks. Achieving sustainability through risk management via risk identification and analysis, gives risk managers the information they need to make better, more informed decisions on an array of risks, including environmental, social, economic, operational and strategic issues [29]. Risk management provides some of the philosophy and techniques that helps to juggle the conflicts around the construction project.

It is clear that risk in economic sector cannot be overlooked by the construction company as it is a very important factor, upon which the success of the organization depends. Most common causes of economic risks are sudden rise of the initial price of the raw materials, inflation, and fluctuation in foreign exchange, increases of local taxes. Construction sector must trace out the resources that create threat to the long-term stability of the environment and also impact the life of the project. Ineffective reverse logistics practices, under-utilized transportation, waste generation, long distances between suppliers and manufacturers are a few of the reasons which increase the negative impacts of sourcing activities on the environment and can lead to pollution and emissions of greenhouse gases; particularly CO2 [30]. Consequently, most frequent social risk in construction sector is the working conditions, safety issues, unemployment and health-related issues such as injury, sickness, epidemic illness, disability, old age and death. Social risk is defined as challenges by stakeholders to company's business practices, due to real or perceived business impacts on broad range of issues related to human welfare [31]. They also added that proper application of social risk management (SRM) helps to effectively and efficiently controls risk. It enhance individual and social welfare in a static setting, contribute to economic development and growth from a dynamic perspective and serves as crucial ingredients for effective and lasting poverty reduction. Each stakeholder usually has their own interest in the project that causes different priorities, conflicts and dramatically increases the complexity of the situation [32]. So it is imperative to manage risk to manage stakeholders in construction. As the stakeholders are a major source of uncertainty, a generic project risk management process framework provides a structure for a review of approaches to analyzing stakeholders and risk management issues [33].

Systematic risk management also helps in the decision making process. At the outset it clarifies the objectives and helps refine the project brief. It identifies the existence of any constraints that could make interruption on the project and to take appropriate decision on it. A systematic risk management approach works as a useful tool to encourages the stakeholders through identifying and quantifying the risks and also provide knowledge to control and reduce risks. Jaafari and Anderson [34] defined risk management in three stages: risk identification, risk analysis and risk response.

Risk management provides a frame that helps out the construction industry to boost their competitiveness through minimizing their business risks. It provided practical implications to the management that can be used to aware and control the emerging risky areas in construction industry. Risk management protects, creates and enhances business value through measurement and management of sustainability threats and opportunities and also added that this can help businesses effectively respond to the growing expectations of the corporate stakeholders [35]. In order to be succeeded and to offer stakeholders value through sustained environmental, social and economic performance, an organization must be capable of recognizing and responding to risks.

V. VALUE MANAGEMENT AS A MODE OF ACHIEVING SUSTAINABILITY IN CONSTRUCTION

Value management (VM) has the capability to assist the absorption of sustainability at the conceptual and design stage of a project. For an organization, a sustainability agenda or model of social, environmental and economic performance creates a powerful opportunity to create enduring value for multiple stakeholders [36]. Committing to sustainability during VM could lead to the vision of generating good economic return whilst delivering accountability and excellence in our social and environmental performance [37]. VM creates the opportunities to minimize environmental, social and economic damage by recommending suitable and productive approach via choosing sustainable materials, determining excellent elements and design for construction. Phillips [38] stated that VM process can be adapted and applied to align stakeholder views and to develop jointly acceptable strategies for moving towards agreed, long term, sustainable solutions. Thus, if the stakeholders of the construction industry take account of sustainability as the aim of their objectives the whole Value Management would also be moved towards it. Schneider [39] recommended the incorporation of sustainability into VM as an effort to move into more resource-efficient construction. VM in construction is increasingly being used as a total practice of enhancing a project value from concept to operation [12].

The outstanding characteristics of VM provide the stakeholders an excellent trade decision, increased effectiveness, better services and quality, better competitiveness, better communication and collaboration inside the organization. Providing sustainability through value management will increase the reputation of construction by enhancing value and enable it to remain competitive in delivering its services, especially in terms of the quality of advice given and proposals produced. If the decision of the VM could be taken at early stage of the project it can create the chance to make sure that construction projects create minimal amount of environmental, economic and social damages. VM process can be adapted to align stakeholder views and to develop jointly acceptable strategies for moving towards agreed, long term, sustainable solutions [38].

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Altogether, taking a pro-active role and creating a practical influence against the different issues related to the stakeholders, value management can make sustainable built environment and produce a balanced solution for all stakeholders.

VI. Method

The main form of data collection comprised semi-structured interviews with a group of 16 senior and high-ranked infrastructure project stakeholders in UK. Face-to-face interviews enabled a probing of responses to explore what the participants were saying so as to ensure that each senior professional gave as full an answer as possible. The interviewees represented environmentalist, sustainability consultant, contractor/builder, designer, engineer, project manager, area manager, development manager, sustainability consultant, technical directors and quantity surveyor. Collectively, these high-ranked participants possessed a wealth of experience in diverse range of construction projects such as roads and highways, house building, schools, dam, water and waste water services both domestic and in overseas. On an average, the recorded open-minded interviews lasted for an hour each and were conducted over a two months period from July 2011 to August 2011. During the analysis, broad themes and patterns were looked for, rather than narrow, precisely variables of qualitative research. The analysis continued until data had been reduced amply to enable conclusions to be drawn. The findings are presented below, where appropriate illustrative quotations drawn from the interview transcripts have been used to convey participants view.

The following section outlines the main themes and sub-themes emerging from analysis of the interview transcripts. The transcribed interviews were then entered into the NVivo – a qualitative research software package for latent thematic analysis. Thematic analyses, as in grounded theory and development of cultural models, requires more involvement and interpretation from the researcher. Three high level themes were finally developed from the interview findings which are Stakeholder Management, Project Risk Management and Value Management. The high-level themes divided into some mid-level themes. As illustrated in Table I, the experience of interviewees ranged from maximum 40 years to minimum of 3 years.

	Organization (UK)	Role of interviewee	Experience in construction and interview duration
#1	Construction Company	Contractor	40 years
#2	Water and waste water services	Project Manager	30 years
#3	Social Housing Company	Client Project Manager	30 years
#4	House builder	Contractor	38 years
#5	Engineering, construction and technical services organization	Sustainability Consultant	7 years 6 months
#6	Water and waste water services	Environmental Engineer	8 years
#7	Water and waste water services	Contractor	3 years
#8	Construction Company	Civil Engineer	8 years
#9	House builders	Developer	15 years
#10	Engineering, construction and technical services organization	Design Engineer	37 years
#11	Gas Networks Company	Team Leader	3.5 years
#12	Engineering, construction and technical services organization	Senior Engineer	3 years
#13	Construction Consultancy Company	Project Director	26 years
#14	Construction Company	Senior Project Services Manager	32 years
#15	Construction Company	Project Manager	14 years
#16	Construction Company	Project Director	35 years

Table I: Profile of the Interviewees

VII. Findings

Stakeholder Management

The sub-theme "Stakeholder Management" produced 127 related passages. This was predominantly mentioned by DC (37 passages), PM (40 passages) and EC (50 passages). This was then further broken down into three associated mid-level themes. The most prominent is the frequent mention of "Managing Different Project Stakeholders" (75 passages); Managing Stakeholders Involvement in the Project itself mentioned in 4 passages. The mid-level themes "Managing Different Project Stakeholders" and "Managing Stakeholder's Impact" are divided into three sub-level themes which are discussed below.

Stakeholder Management (4)	DC (1)	PM (2)	EC (1)	Total (4)
Managing Different Project Stakeholders	27	23	25	75
Managing Stakeholder's Impact	1	10	21	32
Stakeholder Risk Management	8	5	3	16
Stakeholder Analysis	8	16	19	43
Overall	37	40	50	127

Table II: Thematic profile of Stakeholder Management

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Managing Different Project Stakeholders

The sub-theme "Managing Different Project Stakeholders" produced 81 related passages. This was predominantly mentioned by DC (27 passages), EC (25 passages) and PM (23 passages); Stakeholder Management itself is mentioned in 6 passages. This was then further broken down into four associated mid-level themes.

Managing Different Project Stakeholders (6)	DC (4)	PM (1)	EC (1)	Total
Providing Training to Internal Stakeholders	9	5	3	17
Managing Stakeholders Demand	8	11	15	34
Involving all Stakeholders as Early as Possible	6		3	9
Managing Supply Chain	4	7	4	15
Analyzing Stakeholders				
Overall	27	23	25	75

Table III: Thematic profile of Managing Different Project Stakeholders

Regarding the sub-theme "Managing Stakeholders Demand" (34 passages) participants noted that assessing and addressing stakeholder demands must be a proactive process that helps to ensure project efforts and objectives are aligned to meet those needs. They also referenced that it needs to balance the stakeholder's demands considering scope, time, cost, quality, resources and risk to produce a quality product. They also stressed on balancing and competing the demands based on its scope, time, cost, quality, resources, and risk to produce a quality product that will ensure to bring the continuous improvement.

The second most mentioned sub-theme is "Providing Training to Internal Stakeholders" (17 passages). Interviewees mentioned that they arrange deferent types of training program to change the stakeholder's mentality and to educate them. They also added that this training will help them to know different options of improving the energy efficiency, different possibilities of waste management, as a whole it will improve their innovative behavior.

The third most frequently mention is "Managing Supply Chain" (15 passages). Interviewees mentioned that "our management team manages the supply chain which aims to minimize risks and create the business opportunities". Participants indicated that managing the supply chain will help to build better and more sustainable long-term relationships with their partners, in turn will make sure to achieve the competitive advantage.

Managing Stakeholder's Impact

The sub-theme "Managing Stakeholder's Impact" produced 32 related passages. This was predominantly mentioned by EC (21 passages), PM (10 passages) and DC (1 passages). This was then further broken down into three associated mid-level themes.

Managing Stakeholder's Impact	DC	PM	EC	Total
Considering Stakeholders Suggestion			9	9
Stakeholder's Influence to Bring Innovation		10	8	18
Stakeholder as Decision Maker	1		4	5
Overall	1	10	21	32

Table IV: Thematic profile of Managing Stakeholder's Impact

The most prominent is the frequent mention of "Stakeholder's Influence to Bring Innovation" (18 passages). In order to bring innovation through stakeholders' influence, it needs to leverage the organization's internal resources and needs to build relationships with them. Participant #13 concerned that most of the innovative solutions come from their external stakeholders rather than the internal stakeholders. He also added that most of the time clients demand for innovative product and new technology. Then they arrange for different training program for their internal and external stakeholders called innovation days where they talk about new approaches of work. Few of the participants mentioned that they arrange school, university lunch time session where they bring the manufacturer and producers and talk about their stuff competencies, new techniques, environmentally friendly approaches etc. Participant #15 also mentioned that sometimes their contractors, engineers bring some of the innovative products that are last or long period and comparatively cheaper.

The second frequently mention is "Considering Stakeholders Suggestion" (9 passages). Participants considered that integrating the concerns of different stakeholders into the decision process would be particularly beneficial to adopt new technology.

Stakeholder Analysis

The sub-theme "Stakeholder Analysis" produced 43 related passages. This was predominantly mentioned by EC (19 passages), PM (16 passages) and DC (8 passages). This was then further broken down into four associated mid-level themes. To explain the stakeholder analysis participants mostly mentioned about Identifying the Key Stakeholders, Stakeholder Mapping, Prioritizing Stakeholders.

Stakeholder Analysis	DC	PM	EC	Total
Identifying the Key Stakeholders	1	3	3	7
Identifying the Right Stakeholders	3	5	7	15
Stakeholder Mapping	2	5	2	9
Prioritizing Stakeholders	2	3	7	12
Overall	8	16	19	43

Table V: Thematic profile of Stakeholder Analysis

The most prominent is the frequent mention of "Prioritizing

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Stakeholders" (12 passages) to support the stakeholder analysis. After identifying the stakeholders, participants mentioned that the next most important stage is to prioritize the stakeholders based on their influence on the project success. According to participant #8, "Yes we prioritize our stakeholders how influential they are to the project. Are they impacting positively or negatively? Then we have kept them happy and have to manage them. So we prioritize them first and then we manage them accordingly". Participants also mentioned that sometimes situation arise when they need to prioritize only the key people rather than all. Participant #5 mentioned ".....and I can think of a few situations when we want to go through the motions of stakeholder engagement without necessarily engaging everybody in the process. Because there is potential to very long process of engagement. So it's better to prioritizing them who is important"?

Participants considered Stakeholder Mapping as an important step to analyse and understand the key stakeholders and their demand. They mentioned that stakeholder mapping visualize stakeholders demand in relation with the business and in relation to their power and influence. They also said that based on their demand than it would be easier to consider its manageability based on the project cost, time and risk. Regarding the Stakeholder Mapping participant #3 mentioned that, "We always do stakeholders mapping because it shows the interest and who has the ability to influence the project outcome or who can influence to make the whole thing improve". On the other hand participant also expressed their concern that in some cases stakeholders leave the project at the middle, which makes the stakeholder mapping process indeterminate. Regarding this participant #5 pointed that, "…….sometimes situation happens that stakeholders leave or change at the middle of the project due to the change of their demand or getting good proposal from other companies……it makes to map the stakeholders more critical at the beginning".

The third mostly mentioned theme is "Identifying the Right Stakeholders" (7 passages). To analyse the stakeholder's participants focused on identifying the right and specific stakeholder who affect or who will be affected by the changing project process or activities. Participant #2 described that stakeholder can be classed as all persons, organizations or community involved in a project, the target group and the implementing society. He also mentioned it needs to anticipate their different responses and gains and maintains their support or need to be opponent if their demand is controversial. Because of their diverse attitudes participants considered that it is important to find out right the stakeholders who can positively influence on the changing or improving process of the organisation.

On the other hand with regard to "Identifying all project Stakeholders" some of the participants mentioned that rather than doing any classification they treat all of the stakeholders equally and respect individual differences and needs.

Stakeholder Risk Management

The sub-theme "Stakeholder Risk Management" produced 16 related passages. This was predominantly mentioned by DC (8 passages), PM (5 passages) and EC (3 passages). This was then further broken down into six associated mid-level themes. All these mid-level themes are divided into some sub-level themes which are discussed below.

Stakeholder Risk Management	DC	PM	EC	Total
Stakeholder Risk Management	8	5	3	16
Overall	8	5	3	16

Table VI: Thematic profile of Stakeholder Risk Management

Participants mentioned that till now, stakeholder risk has typically been disaggregated across the organisation, which is creating a big gap that is exploited. However, few of the participants agreed that pulling together all project's objectives and anticipating all the risks related to the employees, contractors, clients and other external project team, help the management to monitor and also allow taking appropriate action for timelier identification of potentially counter-productive behaviour. The risk can be then more quickly explored and resolved. Regarding managing stakeholder risk, participant #8 mentioned that, *"Definitely, it's the stakeholder risk in the project team, you need to manage their risk otherwise it hampers your business growth. If you don't anticipate and manage their risk then you will be stuck. You can't manage your project correctly; you can't be the market leader. So if you don't manage risk it will affect you"*. Participants mentioned they follow some risk management strategies to manage their risk related to the internal and external stakeholders.

Project Risk Management

The sub-theme "Project Risk Management" produced 66 related passages. This was predominantly mentioned by DC (29 passages), PM (20 passages) and EC (17 passages). This was then further broken down into ten associated mid-level themes.

Project Risk Management	DC	PM	EC	Total
Risk Assessment	7	2	2	11
Risk Mitigation	2			2
Risk Rating	1	1		2
Risk Register	4	8	8	20
Reducing Risk	2	2	1	5
Quantifying Risk	3	2	1	6
Prioritizing Risk	2	3	1	6
Measuring Risk Impact	3	1	1	5
Identifying Risk	4			4
Risk analysis	1	1	3	5
Overall	29	20	17	66

Table VII: Thematic profile of Project Risk Management

The most prominent is the frequent mention of "Risk Register" (20 passages) to manage the risk. Most of the participants mentioned they use Risk Register and some mentioned Risk Log to identify possible risks and to assess the impact of risk.

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They use this log to assess the risk, to identify its impact, probability so that they can take appropriate action. Participant #2 noted that, *"Risk is one of the big areas that effect our company on projects, it can make and break a project. Each project we will have a risk log. We actually look at risk register every month and we update our project from risk point of view, then we can reduce the risk"*.

To manage risk, participant mentioned that they do risk assessment (11 Passages) as it helps to focus on the risks that is really important and has the potential to cause harm; so that effective measure could be taken to control it. Regarding the second mentioned sub-theme "Risk Assessment", participant #9 mentioned that they do the risk assessment to carefully examine of what situation could cause harm to their employee, so that they can examine whether they have taken enough protections or need to take precaution to prevent the harmful affect.

After the risk is identified participants mentioned that they prioritize the risks (6) according to its effect and significance to impact on the project. Participant #8 mentioned that, *"If there is a biggest threat in our global company, then all possible risks are prioritize further down to project level and then set different risk management strategy in hierarchal level. Then all lie down to the site level; manage the risk on cost, health and safety"*.

Value Management (VM)

The sub-theme "Value Management" produced 32 related passages. This was predominantly mentioned by DC (11 passages), PM (14 passages) and EC (7 passages). This was then further broken down into four associated mid-level themes.

Value Management (VM)	DC	PM	EC	Total
Value Engineering		1	4	5
Delivering Value	8	11	1	20
Managing Product Value	3	2	1	6
Measuring Value			1	1
Overall	11	14	7	32

Table VIII: Thematic profile of Managing Value

The most prominent is the frequent mention of "Delivering Value" (20 passages). Participants especially the project management staffs mentioned that they try to deliver value to their customers to remove unnecessary costs while ensuring that quality, reliability, performance and other critical factors will be met or customer's expectations will be exceeded. Participants noticed following value management provide the stakeholders an excellent trade decision, increased effectiveness, better services and quality, better competitiveness, better communication and collaboration inside the organisation.

Participants also mentioned that they try to Manage the Product Value (6 passages) to incorporate it with the sustainability issues and target so that it would deliver the better quality within cheaper price of the project outcome. Participant #3 mentioned that *"We are looking at achieving best value of our product. I think the best value is another push forward in this moment in the construction industry. We prefer value rather than cost. Quality giving best value and you will be a good contractor when you will give a best value to your client."*

To achieve the economic sustainability participants mentioned that they try to adopt value engineering to reduce the building operating and maintenance cost. Regarding this participant #3 mentioned that, *"We do Value Engineering to find out how to reduce the cost. We have a green route biomass boiler and affordable green timber roof. Everything is very sustainable; we try to provide affordable plastic windows, doors the biomass boiler"*.

VIII. Discussion

Integrating Stakeholder, Risk and Value Management to Get Sustainability

To achieve a sustainable construction project and meeting the sustainability objectives it is really imperative to determine the stakeholder's belief, concern and interest to better deliverance of the project and also it will assist to satisfy the needs of those stakeholders. Most of the interview participants agreed with the fact that if the stakeholder's needs and apprehensions on sustainability issues could be considered and recognized and also integrated them into the design and delivery of a project it will promote a sustainable development in construction sector. Involving stakeholders in project bring confidence in product and will greatly relieve its approval in target audience. Systematic engagement of stakeholders, integrating with the risk and value management helps the stakeholders related to construction project to work together to increase comfort and quality of life, while decreasing negative environmental impacts and increasing the economic sustainability of the project.

Taking sustainability as a way of achieving construction project performance would help the stakeholders to identify specific and cost-effective way of improving the quality and environmental performance of buildings, in both the short and long terms. Stakeholders are the integral part of the project and most of the risks in construction arise from the different stakeholders. It is also imperative to consider their interests to achieve sustainability. The more one knows about the stakeholders and their levels of importance, the more effective and purposeful the risk management strategy will be. The findings show how the project management integrated approach and sustainability related performance are linked. With it being posited that a project management integrated approach to stakeholder management process, value management process and risk management process is a predictor of sustainability related performance.

Risk management not only helps the project itself, also brings benefits and opportunities to the affected stakeholders. Hence, a combined approach of systematic risk and stakeholder

management confirm to enhance the overall value by addressing and eliminating different social, economic and environmental issues linked to the stakeholders. It identifies the opportunities to remove unnecessary costs, managing risks and project duration reduction while ensuring that quality, reliability, performance and other critical factors will be met or customer's expectations will be exceeded. VM aids to develop the construction efficiency through examination of building design and material requirements for sustainable structure.

Risk management protects and permits to produce instant value from the recognition and diminution of risks to the organization and different stakeholders that reduce the efficiency of the project. A systematic and structured risk management aims to manage project value by removing the risks and uncertainties ensuring quality, reliability, performance and the aspects to meet or exceed the customer's expectations. If the stakeholders needs and expectation could not be properly identified and understood, it will finally create a poor value all way through the project and will be wasted of time and afford. VM offers opportunity to remove the issues at the beginning in the project where its impact will be most.

IX. Conclusions

An integrated conceptual model is presented in this paper. This integrated management brings the stakeholders together to increase comfort and quality of life, while decreasing the negative environmental impacts and increasing the economic sustainability. The integration of stakeholder, risk and value management makes the construction industry more creative and energetic to satisfy the customer requirements. To make the integrating process more effective this research could be expanded in future by focusing on validation of the framework through case studies. Particular construction projects would be selected as a case study. The outcome of such case studies will be disseminated through research publications. Moreover, conducting with the stakeholders physically will highlight the impact of their mutual interactions, reveal their common risks and uncertainties among their interactions and find out the way to erase those which have a negative impact to add value.

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An attempt at creating insolvency statistics in the Czech Republic. Description of statistical results and analysis of data gained

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***Abstract*—**The study outlines the problem of statistical recording of insolvency practice in the Czech Republic; it deems it as being inadequate and finds that it provides only sparse testimony on real events. Furthermore, it describes the method of collecting samples of statistical data on the course of insolvency proceedings that took place in the Czech Republic during 2012 and 2013. It also contains processing of data gained and the interpretation thereof, with conclusions as to the real efficiency of insolvency processes in the given area.

***Keywords*—**Collection of receivables, creditor, debtor, insolvency, statistics.

I. Introduction to Insolvencies in the Czech Republic

At present, Act No. 182/2006 Coll. on Bankruptcy and its Settlement Methods, usually referred to in legal circles and professional literature as the Insolvency Act (InsA), is in force in the Czech Republic. Although this act was enacted as early as 2006, it took effect on 1 January 2008. This regulation replaced Act No. 328/1991 on Bankruptcy and Settlement.

The question as to why satisfaction for creditors reached such low levels during bankruptcy proceedings (the number of settlements were minimal) was the main theme of discussion on insolvency law in the CR throughout the nineties and in the subsequent period until the taking of effect of the Insolvency Act. A conglomerate of partial questions were at issue: for instance, the inadequate rights of creditors, the slow pace of legal proceedings, the possibility of obstruction from the sides of debtors and certain creditors. Certain fundamental facts were declared even back then: Court proceedings on the basis of the act on bankruptcy and settlement were risky for creditors, their rights are not adequate and their property is not protected in the period prior to declaration of bankruptcy and not even later. Besides evident problems in the area of financial economics, this also entailed a reputation risk for the Czech Republic.

During this period, a thought construct appeared, based on the conviction that strengthening creditors' rights would lead, thanks to their increased interest in the results of insolvency proceedings and to their more effective decision-making, to greater efficiency of the process as a whole. In theory, this conclusion is quite logical. However, the relationship does not work entirely according to theoretical expectations.

The above-mentioned thought was based too heavily on faith in the basic hypothesis and did not take into account other realities, especially the motivation of individual participants of insolvency proceedings (for more, see [1] pp. 28–56). The first five years of the usage of InsA did not bring about changes that we could call fundamental – not even in the behaviour of creditors. It is quite evident that InsA is a more suitable legal framework and opens a substantially greater space for more creative, faster and more effective solution of debtor bankruptcy than what was the case with the Act on Bankruptcy and Settlement. On the other hand, however, even this considerable improvement of the legal framework did not produce the expected results.

One of the reasons is the fact that participants of insolvency proceedings are often not willing to enter the proceedings and participate therein – among other things, because their experiences with the insolvency system do not guarantee recoverability of the funds expended on proactive collection of receivables through insolvency proceedings. Creditors do not adjust their behaviour according to theoretical expectations, but primarily according to the probability of collecting at least an interesting part of receivables in comparison with expended transaction costs (see [1] pp. 52–55). In this decision process we have, on the one hand, transaction costs necessary for a particular subject to actively check and support insolvency proceedings; on the other hand, there is also the potential return from the proceedings. Given this choice, of course, active participation in insolvency proceedings loses.

This work forms part of the research project "The Research of Insolvency Practice in the Czech Republic Aimed to Create a Proposal of Legislative Changes Helping to Increase the Returns for Creditors in Insolvency Proceedings, thus Improving the Competitiveness of the Czech Economy" registered at the Technological Agency of the Czech Republic (TA CR) under the registration number TD020190.

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II. DECEPTIVE INTERNATIONAL COMPARISON

Our problem with judging the efficiency of insolvency proceeding can be called lack of information. This phenomenon has been described previously for the Czech environment – for instance, from the perspective of regional and field division of debtors [2], possibly from the perspective of our information on incidental proceedings conducted simultaneously with insolvency proceedings [3], or from the perspective of possible prediction on the development of numbers of insolvency proposals and declared bankruptcies [4]. A fundamental analysis of the problem has been given in other works [5]–[7]. As regards Czech official statistics, these enabled until recently (until the publication of the explanatory memorandum to the amendment of the Insolvency Act in April 2013) only a comparison of numbers of insolvency cases, a basic distinction according to whether a physical person or business was at issue, whether the proposal was dismissed or otherwise concluded prior to the declaration of the debtor's bankruptcy; it is also possible to work with the number of declared bankruptcies, permitted reorganizations and permitted debt clearances. In these outputs, however, there is no information whatsoever as to the outcomes of such proceedings, i.e. the extent to which creditors are satisfied, what are the costs for insolvency administrator fees and so forth. This means that we have certain information on the legal and administrative aspect of matters, but only minimally on economic circumstances.

As regards international comparisons, only data issued regularly by The World Bank and International Finance Corporation institutions [8] are available under their Doing Business project. According to these data, yields for creditors from insolvency proceeding have sharply increased, the length of proceedings has decreased and costs expended on the parts of creditors for the course thereof have decreased. These results, however, are divergent from reality. This is logical – in the case of Doing Business, these are not the results of exact research on the course of insolvency processes, but the estimates of experts addressed in individual countries. Labelling this comparison as statistics is imprecise and misleading; on the other hand, the methodology for gaining data is stable, and if one can judge from available information, it is the same for all countries included in the survey. In principle, these figures are gained through experts from individual fields responding to questions concerning a model case of insolvency proceedings. This, however, means that their responses (however serious and able the experts may be) do not bear testimony on insolvency processes as a whole in the given country, but on the expected outcome of insolvency proceedings in one imaginary, but specific case. The difficulty therefore lies in the fact that the "typical bankrupt" is not a typical bankrupt whatsoever, at least not in the environment of the Czech Republic. It thus transpired that these figures are perhaps suitable for comparing the efficiency of various systems together and for showing basic trends in individual states; but they do not in any way speak of the real situation in a representative way.

National statistics are mostly unavailable even in other states, and if some figures do appear, they can be compared only with difficulty. The conventions of individual legal amendments, the procedures of insolvency proceedings and individual mechanisms are in fact so divergent that it is practically impossible to carry out a common comparison. An example: Certain states have restrictions as to which entrepreneurial subjects can enter the bankruptcy process. The issue is mostly that they have to be large enough. Cases of smaller companies and entrepreneurs are settled at levels lower than that of the court and according to other regulations.

TABLE I. DURATION OF INSOLVENCY PROCEEDINGS IN YEARS AND RATE OF RETURN IN PERCENTAGES OF INVESTMENT VOLUME

Year	Duration of proceedings	Rate of return
2002	9.2	15.4
2003	9.2	15.4
2004	9.2	16.8
2005	9.2	17.8
2006	9.2	18.5
2007	6.5	21.3
2008	6.5	20.9
2009	6.5	20.9
2010	3.2	55.9
2011	3.2	56.0
2012	3.2	56.3

The World Bank, IFC 2012

III. EXAMINATION OF REAL RESULTS IN THE CZECH REPUBLIC

Because only a minimum of data exists for the CR from official resources, ascertaining them meant that it was necessary to proceed to an analysis of available information on individual cases of insolvency proceedings and deduce a general concept on the course of insolvency proceedings therefrom. A database gradually forms on the principle of gradual gaining of data from individual proceedings; this contains all cases of insolvency in the Czech Republic, specifically those in which a debtor's bankruptcy was declared, the method of settling the bankruptcy was decided and, at the same time, the insolvency administrator's closing report was approved; in other words, where the proceedings were essentially completed (subsequent actions are then purely administrative and change nothing in the real results of the proceedings). At the same time, proposals that did not reach this phase because they were rejected, suspended or dismissed by the court (according to Section 142 to 146 InsA) were also examined.

A. Parameters of the sample examined and discussion on the sample

In total, 615 cases of insolvency proposals were scrutinized and processed in the period spanning the second part of 2012 and the first months of 2013; this is 7.77 percent of all proposals filed in the observed period (from 1 January 2008 to the beginning of October 2012) and at the same time such cases where the proceedings reached approval of the insolvency administrator's closing report, in some cases

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proposals that were dismissed, suspended or rejected. Of course, we now speak only of those filings that were aimed at trading companies or entrepreneurs. The sample as such was selected at random and every tenth case was investigated in the order in which the insolvency proposals were presented to the court.

B. Some general remarks on statistical recording of insolvency processes

Here there are several aspects of a more general nature to which attention should be drawn in so far as they can, under a certain arrangement, entail a divergence of results gained (on the basis of this sample) from future results stemming from scrutiny of one hundred percent of all insolvency cases. It is especially here where the definition of insolvency proceedings and what exactly we understand by this concept are at issue. In general, insolvency proceedings are understood rather as being a longer system of steps in time, with the proviso that decisions are made during these proceedings regarding the debtor's property and steps aimed at satisfying creditors are taken. Ultimately, this broadest understanding of the situation resonates with the definition of the term insolvency proceedings as it is given in the Insolvency Act itself. "For the purposes of this act it is understood that (…) insolvency proceedings are court proceedings, the subject of which is the debtor's bankruptcy or threatening bankruptcy and its settlement method."(quoted according to [9] p. 3)

However, in real practice (as the presented survey has, moreover, shown), a significant amount of insolvency proceedings do not at all reach the phase of steps where the debtor's property would be touched and which would move in the direction of satisfying the creditor, i.e. which would be a settlement of a debtor's bankruptcy and would thus correspond in its content to what we consider to be insolvency proceedings. In reality, a large number of proceedings are suspended or otherwise terminated still before the debtor's bankruptcy is even declared, or, bankruptcy is declared in a significant number of cases, but the proceedings do not continue even so, the reason being the non-existence of relevant property on the part of the debtor. This is a considerable methodological problem from the angle of statistics that would bear witness to the whole and comprehensively describe events taking place in the context of insolvency proceedings.

If we were to, for example, apply figures gained from completed bankruptcies to all filed insolvency proposals to assess satisfaction of creditors, our result would not say anything about how well the insolvency system works. If a significant percentage of insolvency proposals were rejected due to faults, for instance, there would be no point in applying these cases to the issue of yields for creditors. On the other hand, if we applied the yields of these bankruptcies only to those bankruptcies where satisfaction of creditors occurred, we would also produce completely unrealistic statistical results. These would not respect cases where no relevant property stood against receivables.

C. Fundamental parameters of results

In Table II, we can observe the basic division of these cases that give us a certain primary concept especially on how insolvency proceedings run when they commence. When individual cases were being examined, however, it was found that terms from Section 142 InsA were used imprecisely on the parts of insolvency administrators; as a result, it cannot be precisely determined from available documents how precisely this paragraph was used. Section 142 makes a distinction in individual points as to:

- rejection of an insolvency proposal due to faults,
- suspension of proceedings due to lack of conditions for proceedings which cannot be removed or which could not be removed,
- suspension of proceedings due to revocation of the insolvency proposal,
- dismissal of the insolvency proposal,
- dismissal of the insolvency proposal for lack of debtor property (for more, see [9] p. 291).

It would subsequently be necessary to interpret the data gained and attempt (on the basis of experiences from cases where the use of the above-mentioned section was defined precisely) an interpretation of the other cases so as to be able to continue in the analysis of the results of the survey.

TABLE II. BASIC RESULTS FROM A SURVEY OF INSOLVENCY CASES

	Number of cases	Percentage of the whole
Total number of cases in the sample	615	100.00
Proposals rejected due to faults	93	15.13
Suspended proceedings (e.g. revocation)	56	9.10
Dismissal on general grounds	126	20.48
Dismissal for lack of property	153	24.88
Bankruptcy declared	179	29.11
Minor bankruptcy declared	8	1.30
Reorganization declared	0	0.00

Source: Insolvency register, own findings, own calculations

From the legal point of view, the following departure points provided the basis for analysis:

- In a case of rejection, the procedure is defined more precisely in Section 128 of the Insolvency Act; it is assumed that the court acts in this manner if the proposal does not contain all the prerequisites. A seven-day deadline as of filing the proposal is designated for rejection or for the court to summon the plaintiff to supplement the proposal.
- Suspension of proceedings is defined by the civic court code on a general level, and Section 108 is specified for the purposes of the Insolvency Act; there, a case where the plaintiff does not pay a deposit for the

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expenses of insolvency proceedings is stated as being one of the main causes for suspending proceedings.

- Cases of revocation are then settled by Section 130. In fact, this category included also other cases of insolvency proceedings which are not dealt with by Section 427 InsA (the main interests of the debtor are in other EU countries and the debtor does not have business premises on the territory of the Czech Republic on the date when the proposal is filed), possibly other variants where the court discovers problems in the issue of local competence or jurisdiction or, on the contrary, discover a problem in the competence of the plaintiff.

As for the analysis of data gained, the most important variant transpired to be the non-payment of the deposit for costs of proceedings on the part of the plaintiff – in all probability the creditor in the given context, although perhaps peripherally it could also be the debtor (it is, however, uncertain why it would file a proposal against itself if it were unwilling to pay the deposit, which is a thoroughly predictable requirement from the court before the proceedings are continued, i.e. prior to a declaration of bankruptcy).

If we wanted to somehow interpret the situation where a plaintiff does not pay a deposit, we must then assume that, in such a case, the plaintiff does not expect any relevant debtor property to be found, and thus does not expect that the deposit will be returned (although a receivable equal to the receivable behind the property base is at issue, which entails preferential status). The plaintiff probably arrived at the opinion (during the period between the filing of the proposal and the moment when it was summoned to pay a deposit) that the debtor has no marketable property, which is why it desists from further proceedings. Or perhaps it did not concern itself with the issue of the debtor's property and had no information about it, but expected that one of the other creditors would be willing to pay the deposit – none, however, can be found that could be convinced of the existence of relevant debtor property. In such cases, however, we can assume that the debtor in fact does not have any property at all that could cover the plaintiff's or other creditor's costs (at least the deposit paid). This remark is very important for the general interpretation of the problem of insolvency proceedings in the Czech environment. On the basis of these assumptions, we have considered the above-mentioned cases to be of the type where lack of debtor property was ascertained.

This means that we can consider rejections of proposals (in one hundred percent of these rulings, in principle) to be cases that, in their consequences, do not bear testimony regarding the facts which interest us – i.e. on the utilization percentage of insolvency proceedings, their efficiency, length and especially on the insolvency situation in Czech economy generally. Suspended proceedings may not "basically" commence, but they do give a signal as to the extent to which debtors' businesses enter into insolvency proceedings without any meaningful property that would give creditors hope for at least partial satisfaction of their receivables.

Rejection of an insolvency proposal and suspending of proceedings are procedural rulings, while in both cases commencement of insolvency proceedings may occur, but in a case where a proposal is rejected, it is still debatable whether we can understand the actual filing of the proposal and its subsequent rejection as information on a debtor's state of insolvency, and we can even doubt whether (in certain cases of suspension) the debtor is in fact a debtor in the sense of the Insolvency Act. In reality, it would be best to exclude these cases from statistical surveys completely, as their only predicative ability is information on the administrative burdening of the courts.

Sections 143 and 144 InsA concern cases of dismissal and dismissal for lack of debtor property. In both cases, judgment on merits and negative judgment at that are at issue. Dismissal as such has, in turn, a relatively complex structure, and it is not simple to deal with an interpretation of such a court ruling. Most importantly, this is a case where it cannot be certified that the plaintiff and at least one other person has a payable receivable against the debtor. It is evident at the first glance that a significant number of possibilities can exist here, from cases where we are the witnesses of a bullying proposal and the debtor is not necessarily in insolvency whatsoever and does not fulfil conditions for declaration of bankruptcy, to the variant where the singularity of the plaintiff and non-existence of another creditor becomes apparent. This is highly unlikely in reality, but not impossible.

Dismissal can occur even in cases where the debtor proves that its inability to repay (not over-indebtedness) is the result of illegal activity of a third party or when the state or a higher territorially administrative whole vouches for its receivables. The first variant is not unusual; we can consider the second to be a special case.

Where dismissed proposals are concerned, we can thus speak mostly of a situation where the plaintiff has not corroborated the relevance of its receivable or when the debtor is able to cast this receivable into doubt (or it is, for instance, the subject of a lawsuit between the debtor and creditor and the insolvency proposal is a step which is meant to induce the debtor to be more accommodating in this lawsuit). But more careful observation of specific cases shows that, even in this case, there are a certain percentage of cases which we could interpret as situations in which the debtor is objectively in bankruptcy, and it can even be expected that it does not have any relevant property at its disposal, but it stalls its bankruptcy (or rather, formal declaration of bankruptcy) using various methods – for instance, casting all of its receivables into doubt. In an entire aggregate of dismissed proposals according to Section 143, we are therefore faced with an interpretational problem once again. This group of insolvency proceedings in fact do not bear clear witness on insolvencies and, especially, do not bear testimony as to the debtor's situation or qualities of the proceedings, but is rather a report on general relations in the economic space of the country. We cannot really judge whether the debtors in these insolvency proceedings are not the

victims of bullying or whether they are in fact bankrupt, but are defending themselves against declaration of bankruptcy thanks to formal errors on the parts of the creditors.

Cases dismissed for lack of debtor's property are, by contrast, quite evident. Further expenditure of creditors' funds or court energy makes no sense or insolvency proceedings as a collective procedure when collecting receivables loses meaning here. Cases of declared bankruptcies, minor bankruptcies and, finally, reorganization that do not appear in the given sample are similarly indubitable. Their singularity has, however, already been shown earlier (especially [10], [11], but also [6]).

D. The second level of data analysis

On the basis of the above-stated data from Table II, we can now form a secondary model of the examined insolvency proceedings. This modified data enables us to examine the efficiency of insolvency proceedings as such, as in this way, we are able if need be to separate insolvency proposals and insolvency proceedings where the debtor is in fact not bankrupt, the debtor's bankruptcy cannot be proved, or the proposal was filed without justification.

TABLE III. BASIC RESULTS FROM THE EXAMINATION OF INSOLVENCY CASES

	Number of cases	Percentage of the whole
Total number of cases in the sample	615	100.00
Rejected proposals and suspended proposals (inconclusive proposals and similar)	213	34.64
Proposals terminated variously due to non-existence of debtor property	215	34.95
Proposals settled by one of the methods for settling bankruptcy	187	30.41

Source: Insolvency register, own findings, own calculations [5] pp. 97–98

Table III presents us with findings that are in themselves valuable and, without doubt, interesting. Most importantly, 69.59 percent of cases of insolvency proposals (rejected proposals or suspended proceedings plus proposals terminated in various ways) do not even reach the phase which we consider to be insolvency proceedings as such, where the insolvency administrator and court take steps moving in the direction of satisfying creditors' claims. It is clear that, in view of the administrative demandingness of the whole system, this fact markedly reduces the efficiency of the insolvency process and increases its costs, because even though proceedings do not take place here, it is nevertheless necessary to exert a certain administrative effort for this filing to be correctly officiated. We are also witnesses to the situation where more than a third (34.64 percent) of the entire number of insolvency proposals raises doubts as to whether a bankrupt debtor truly exists, whether the Czech courts are locally pertinent for settling an incidental debtor bankruptcy or whether these proposals have such serious faults that proceedings make no sense. This is an extremely high figure and it is worth noting that even if certain facts emerge that devalue the whole insolvency proposal, the debtor is made public (in the insolvency register, which, however, mostly means that business partners usually take notice of this fact), and until a decision is taken regarding further steps, Sections 103 and 111 InsA (where effects concerning the start of insolvency proceedings are described) apply fully to it (the debtor).

The survey thus (at least in its present stage) confirms the hypothesis according to which an enormous number of debtors enter the insolvency process at a time when their businesses (or when persons doing business) no longer own any relevant property. Here we could probably find reasons why creditors (despite indisputably higher-quality legislation) are still highly distrustful towards insolvency proceedings and why they frequently do not exert the expected activity.

E. The third level of analysis – obtrusive filings

If we were to look at the efficiency of insolvency proceedings in the country in terms of the results summarized in Table III, we would have to declare that any attempt to increase their quality is faced with the considerable burden of "obtrusive" proposals that do not and cannot lead to satisfaction of creditors and thus to fulfilment of the sense of insolvency proceedings. Furthermore, we must declare that a part of these proposals (but not a substantial part from the perspective of whole numbers) are motivated with the intention to bully and, from the creditor's point of view, are meant to replace other procedures when collecting receivables – for instance, an individual attempt at collection via forfeiture. In certain cases, proposals that were probably filed under unethical competition (aimed at damaging a competing subject on the market) have been recorded. Such proposals are usually connected with a debtor's attempt to gain a public tender and are meant to cast into doubt its ability to meet its commitments.

The number of cases in which creditors are doomed in advance to a one hundred percent loss from a receivable devalues any endeavour towards practical impact (increase of returns for creditors) through improvement of legislation. This is especially marked if we agree to a more careful scrutiny of data that were ascertained on such proceedings where steps towards satisfaction of creditors (i.e. towards monetization or at least an attempt at monetizing debtor's assets) were truly taken. A total of 187 of such cases appeared in our sample, of which the vast majority were bankruptcies and, to a minimal extent, minor bankruptcies. As regards reorganization, not even one case appeared in our sample.

With knowledge of previous conclusions of the survey, it is in fact not surprising that in 93 cases of insolvency proceedings, when a debtor's bankruptcy was settled by bankruptcy or minor bankruptcy, no satisfaction of creditors occurred and the deposits paid or the monetization of the debtor's property sufficed only to cover the expenses of the proceedings and, in some cases, not even for these expenses, so the state covered a part thereof. This made up 49.73 percent of the whole, i.e. of the total number of declared bankruptcies or minor bankruptcies.

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If we added this number of 93 cases (in which lack of debtor's property was gradually discovered during insolvency proceedings) to the already ascertained 215 cases from Table III, our total number of proceedings in which the debtor's property did not suffice for partial (even minimal) satisfaction of creditors would already reach 308, which is 50.08 percent of our examined sample (615 cases). If we also accept the thesis that, of those 615 cases, 213 cases (see Table III, the row of proposals rejected or suspended) de facto did not fulfil conditions for settlement through insolvency proceedings (or were bullying), the proportion of these cases in fact increases to 76.61 percent.

Therefore, up to two thirds of insolvency proceedings conducted in the CR on the basis of legitimate insolvency proposals were of the sort where debtor's property no longer exists and creditors receive no satisfaction whatsoever.

F. The fourth level of analysis – rate of return

In the preceding comparison, we worked in a basic sample even with insolvency proceedings where no ascertainment of the volume of receivables occurred; we are thus unable even to estimate what sum the creditors lost and we are also unable, therefore, to finish calculating an estimate for the entire sample of insolvency proceedings. In the following passage, we focus on an analysis of the rate of return for creditors in those cases where business failure was declared and the debtor was declared bankrupt (or a minor bankruptcy was declared). This means that we now speak of cases where the debtor has some property at its disposal or where a creditor was willing to pay a deposit for the proceedings' expenses and risk (besides its receivable) further loss of money. In the second case, payment of a deposit suggests that the creditor has some information about the debtor's situation.

In our sample, we discovered a total of 187 cases where the debtor was declared bankrupt or a minor bankruptcy was declared. In the context of these insolvency proceedings, receivables amounting to a total of 245.1 million crowns for secured creditors and 2,224.3 million for non-secured creditors were claimed and recognized, i.e. a total of 2,469.4 million for both groups of creditors together. In comparison with the volume of recognized receivables, the yield from monetization is essentially marginal. A total of 89.4 million crowns were paid out, of which 61.2 million was paid to secured creditors and 28.2 million to non-secured creditors. The average satisfaction of debt thus reached 3.62 percent. In the context of these proceedings, secured creditors were satisfied at a rate of 25 percent of their claimed and recognized receivables, non-secured creditors at a rate of 1.26 percent.

TABLE IV. THE FINAL RESULT MODEL OF SATISFACTION OF CREDITORS

	Number of cases/volume	Percentage of the whole
Total number of cases in the sample	187	100.00
Cases in which creditors are satisfied	94	50.27
Cases where creditors are not satisfied	93	49.73
Volume of recognized receivables total (mil. CZK)	2 469.4	100.00
The volume of recognized secured receivables (mil. CZK)	245.1	9.93
The volume of recognized, non-secured receivables (mil. CZK)	2 224.3	90.07
Total paid out to creditors (mil. CZK)	89.4	100.00
Paid out to secured creditors	61.2	68.46
Paid out to non-secured creditors	28.2	31.54
Total pay-out ratio (paid out/receivables)	89.4/2 469.4	3.62
Pay-out ratio to secured creditors (paid out/receivables)	61.2/245.1	24.96
Pay-out ratio to non-secured creditors (paid out/receivables)	28.2/2 224.3	1.26

Source: Insolvency register, own findings, own calculations

The very low rate for non-secured creditors is not surprising as it was never assumed that the result should be somehow wildly divergent here. In certain partial studies, the rate of return was estimated even lower; InsolCentrum, for instance, gives two possible figures – 1.99 percent or 6.22 percent (These are data from proceedings that took place during 2011), which are made public in a very partial way on the server insolcentrum.cz). However, the rate of less than 25 percent for secured creditors is clearly the greatest surprise in the survey. An interpretation of this result is quite complicated. However, it seems to be a summary of various aspects, where especially two are crucial:

- The crisis – in essence, the economic recession and the drop in asset values connected thereto has been continuing throughout the time the Insolvency Act has been fully functional, which also concerns to the entire extent the manner of securing loans, i.e. pledging of real estate. This crisis has, moreover, deepened in time, which leads to the effect of insufficient securing of loans.
- Glut of supply – the growing number of bankruptcies of entrepreneurial subjects leads to a glut of collateral, while demand is poor due to the recession. This does not apply only with real property, but also with machinery and other movables.

The problem of low rates of return for secured creditors is in all probability not connected with legislation, as this is accommodating to creditors in this case. This creditor has considerable control of the manner in which the collateral is sold, it has the possibility to influence costs for maintenance of the collateral and further costs connected thereto (for instance, approve expenditures for securing and insuring the real estate), the insolvency administrator's fee is transparent and can be estimated fairly clearly.

IV. CONCLUSION

One of the main characteristics of the insolvency process in the Czech Republic in the post-2008 era has been the obvious lack of assets in the balance sheets of debtors, which hinders any sensible outcome of the insolvency proceedings. This is also the reason why the level of satisfaction achieved by creditors, both secured and unsecured, has been very low, with

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cases where the government has to cover the cost of the proceedings with public money not being so rare. An extensive statistical research carried out on a representative sample of insolvency proceedings initiated after the Insolvency Act took effect (after 01 January 2013) has revealed that the creditors satisfy a mere 3.62% of their registered and recognized claims. While the secured creditors see 24.96% of their claims satisfied, the unsecured creditors recover only 1.26% of their total claims. These numbers are in stark contrast with international comparisons according to which the level of recovered claims in the Czech Republic attains more than 50% (56.3% in 2012).

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Atypical regional integration and the new global economic growth poles

Romeo-Victor Ionescu

***Abstract*—**The title of the paper is connected with a very new approach from November 2013: the implementation of a new regional atypical organization MINT. Practically, there are no other studies connected to this phenomenon. The objective of the paper is to analyse the viability of this organization and to forecast its impact on the global economic world. The analysis in the paper is built on two levels: first is a cluster analysis made in order to identify MINT as global economic actor alongside BRIC, EU28 and USA. Second, is a forecast made in order to support the idea of the positive trend for MINT at least on short-term. The analysis is based on the latest official statistical data. The main conclusion of the paper is that MINT is an alternative way to face the global crisis' challenges and support the idea of atypical economic integration.

***Keywords*—** Economic forecast, regional cluster, regional integration, socio-economic disparities.

I. Introduction

THE impact of the global crisis on national economies is very powerful. All global important economic actors faced great difficulties in order to face the crisis' challenges. Nowadays, these economies are under an economic recovery process, which is far away from the final step.

An alternative approach to the individual national efforts of economic recovery seems point at regional integrations. There are a lot of regional organizations which try to face the crisis' impact using common measures and regulations. The problem is that even powerful organizations, as the EU28, have difficulties in achieving the economic recovery.

This is why a new trend developed in the global economy: the atypical integration forms. A model of such integration form is BRIC(S), which covers Brazil, Russia, India and China (South Africa). BRIC was implemented after the Ekaterinenburg meeting BRIC, in June 2009 [1].

The Goldman Sachs' experts consider that these four countries would exceed the G7 economies in the next 20 years. This objective can be achieved as a result of the present global crisis.

While the occidental countries face to economic decreases, BRIC continues the economic growth, even that it is smaller. The political impact of BRIC can be significant if its member states agree the idea to find together alternative ways to the present evolutions from the developed countries' markets [2].

Unfortunately, BRIC members were not able to sustain high economic growth rates as they promised. Only China reiterated its high economic growth at least for the next 10 years, while Russia forecasted only a 2.5% annual GDP growth rate for the same time period.

The above global and regional evolution was upset by the idea of a new atypical regional organization, MINT. The announcement was made at the middle of November 2013. MINT covers Mexico, Indonesia, Nigeria and Turkey, which are considered as the new engines of the world economic growth.

Moreover, the development of the MINT is accompanied by the downfall of the BRIC [3].

The first intermediate conclusion is that the national economies try to find conjuncture coalitions, not traditional coalitions in order to ensure their sustainable development. These conjuncture coalitions are flexible built around a punctual strategic interest.

II. Specific scientific literature review

There are not dedicated scientific studies about MINT as a whole yet. The concept of MINT is too new. As a result, the analysis has to base on scientific studies related to MINT's individual economies.

Mexico ranked the 11th position in the world economy, according to its GDP (by purchasing power parity, PPP). The GDP growth rate achieved 3.9% in 2012 [4]. The inflation rate was 3.6% in the same year, and the unemployment rate was 5.0% [5]. The public debt in Mexico achieved 36.9% of GDP.

The second member of the MINT is Indonesia, which achieved the 15th rank in the world economy in 2012. Indonesia supported a 6.23% GDP growth rate in the same year [6], connected to an inflation rate of 4.61% and an unemployment rate of 6.0% [7]. The public debt was relative small, 23.9% of the GDP in 2012.

Nigeria ranked the 30th position in the world economy in 2012, with a GDP growth rate of 7.1% [8]. The inflation rate was 11.9% and the unemployment rate achieved 24.0%. A positive trend was achieved in public debt, which was 18.8% of GDP in 2012.

Turkey is an economy under economic recovery, which managed a GDP growth rate of 2.5% in 2012 (16th rank in the world economic top). The inflation rate was 7.0% in the same

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year, and the unemployment rate was 8.2%. The public debt in Turkey was 36.3% of GDP [9].

So, the above four economies members of MINT have approximately the same macroeconomic evolutions. Moreover, their GDP structures are supported by services and industry and the recovery economic processes are not finished. The economic potential of these countries is big and they started to become important actors in the world economy.

III. Research Methodology

It is very difficult to support the idea of decreasing BRIC and increasing the role of MINT in the global economy. As a result, the paper proposes a comparative analysis between BRIC, MINT, USA and EU28 as main global economic actors.

In order to achieve a realistic economic analysis, we use four synthetic indicators: GDP growth rate, inflation rate, unemployment rate and public debt. These indicators were collected from the same year, 2012, the latest one with all official economic information.

The next step of the analysis is to realize a new grouping of the above countries, according to their macroeconomic performances, under a cluster analysis. The paper uses two-step cluster analysis, where the distance measure is log-likehood. The number of clusters is specified fixed: 4, while the clustering criterion is Schwarz's Bayesian Criterion (BIC).

The paper operates with distinct clusters analysis for each economic indicator, in order to see if the cluster quality is at least fair for the regional economic organizations.

Moreover, the paper completes analysis with a forecast for the next two years, using ARIMA method. The dependent variables are GDP growth rates for all eight national economies and the independent variables are the years. This second method of analysis allows us to test the viability of MINT as atypical regional economic organization in time.

IV. Pro or Against the New Atypical Regional Economic Organizations

In order to realize the comparative economic analysis, the economic data were presented in Table 1.

Table 1 Economic data (2012)

Country	GDP growth rate (%)	Inflation rate (%)	Unemployment rate (%)	Public debt (% of GDP)
Brazil	0.9 [10]	7.1	5.5 [11]	35.21
Russia	3.4 [12]	6.7	6.4	10.3
India	3.99[13]	4.7	3.8 [14]	67.59
China	7.8 [15]	5.4	4.1	-
Mexico	3.9	3.6	5.0	36.9
Indonesia	6.23	4.61	6.0	23.9
Nigeria	7.1	11.9	24.0	18.8
Turkey	2.5	8.0	8.2	36.3
EU28	-0.316]	2.6	10.5	45.7
USA	2.2 [17]	1.1	8.1	107.6

The first step of the analysis is to realise clusters for each economic indicator, in order to conclude if MINT is viable or not from the economic point of view. According to GDP growth rate, our cluster synthesis supports the idea of MINT as viable regional economic organization (see Fig.1).

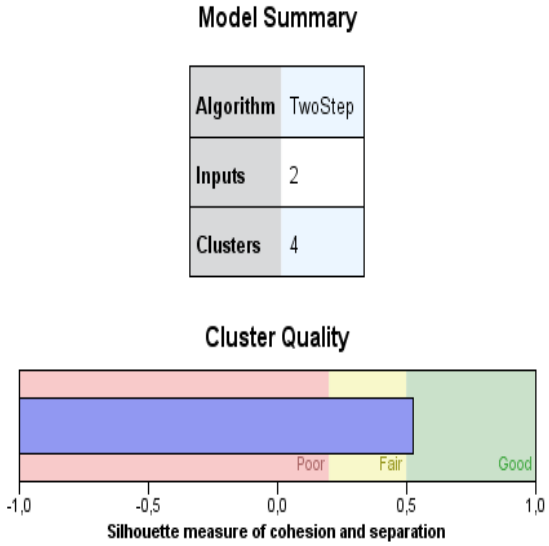

Fig. 1 cluster analysis related to GDP growth rates

The same results are if we use inflation rate, unemployment rate and public debt: a fair cluster quality.

The intermediate conclusion is that MINT can be considered a distinct cluster on the global economic map.

In order to analyse the viability of MINT in time, the analysis continues with a forecast for 2013-2015 time period based on GDP growth rate trend (see Table 2).

Table 2 GDP growth rates (%)

Country	2010	2011	2012	2013	2014	2015
Brazil	7.5	2.7	1.3	0.0	-3.0	-8.0
Russia	4.3	4.3	3.6	3.3	3.0	2.6
India	10.1	6.8	5.4	3.8	1.2	0.5
China	10.4	9.2	7.8	7.0	5.0	4.0
Mexico	5.6	3.9	3.8	3.0	2.0	1.0
Indonesia	6.1	6.4	6.23	6.4	6.5	6.6
Nigeria	8.0	7.4	7.1	6.5	6.0	5.5
Turkey	9.2	8.5	3.0	2.0	-2.0	-5.0
EU28	2.1	1.5	-0.3	-1.0	-2.0	-3.0
USA	2.4	1.8	2.2	1.9	1.8	1.7

The above table was realized using the forecast results from Fig. 2.

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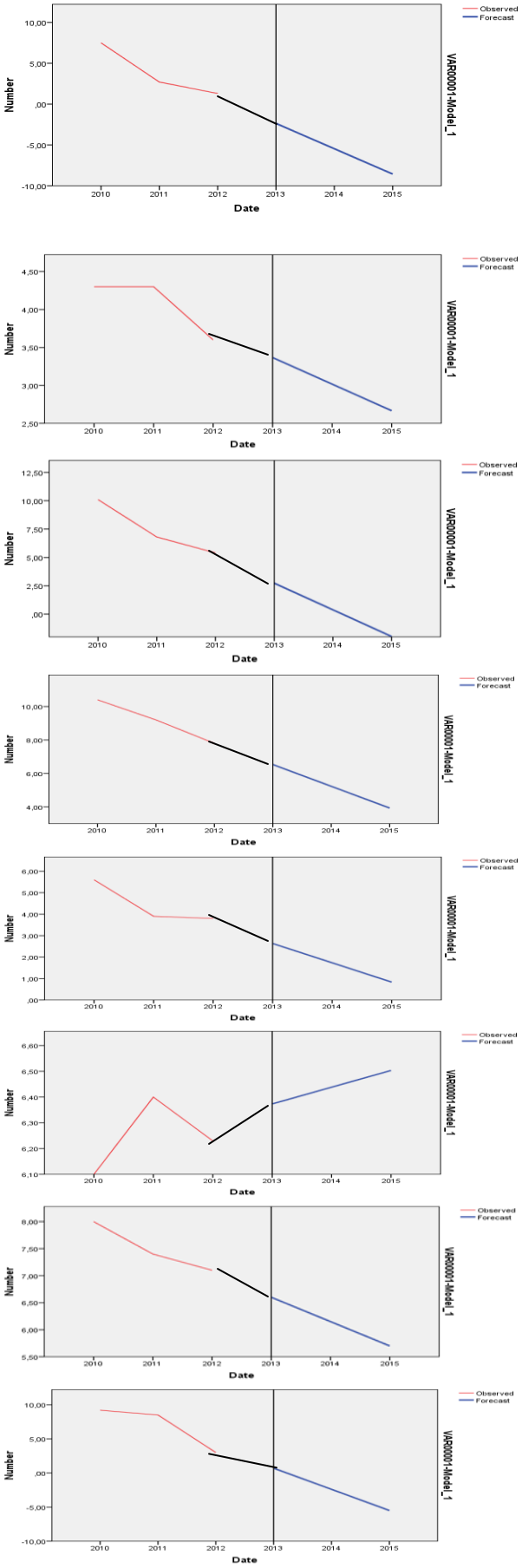

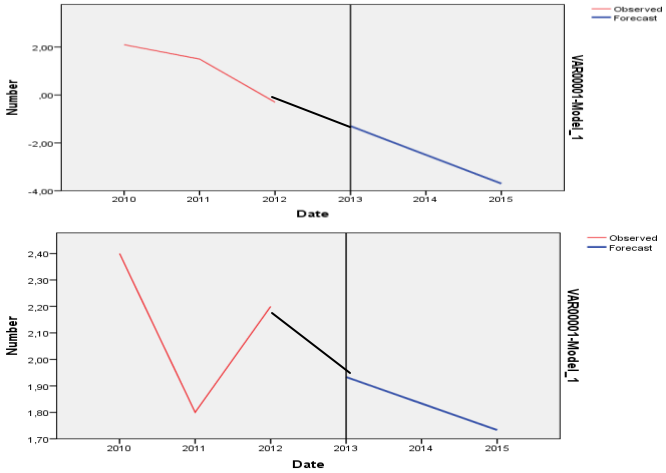

Fig. 2 GDP growth rate forecast

According to the above figure, the short-term economic evolution in the above 10 countries is not positive. These economies are not yet able to eliminate all global crises' effects. As a result, their economic recovery is difficult.

V. Conclusion

The analysis in the paper supports the idea of new atypical regional economic organizations able to face the global crisis' challenges.

MINT seems to be such a successful example. Nowadays this economic organization represents an important engine of the global economic growth. The economic structure and the performances of its member states are practically the same.

Moreover, MINT becomes a global economic actor, which will have a real impact on the economic world. The forecast in this analysis supports the idea that MINT will be efficient as cluster at least on short-term.

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Annex

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PREDICT THRU END.
* Time Series Modeler.
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  /MODELSTATISTICS  DISPLAY=YES MODELFIT=[
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  /MISSING USERMISSING=EXCLUDE
  /MODEL DEPENDENT=VAR00001 VAR00002
VAR00003 VAR00010 VAR00004 VAR00009 VAR00005
VAR00006 VAR00008 VAR00007
INDEPENDENT=YEAR_
    PREFIX='Model'
  /ARIMA AR=[0] DIFF=0 MA=[0]
    ARSEASONAL=[0]  DIFFSEASONAL=0
MASEASONAL=[0]
    TRANSFORM=NONE CONSTANT=YES
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DENOM=[0] DIFF=0 DELAY=0
  TRANSFORM=NONE
  /AUTOOUTLIER DETECT=OFF.
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Time Series Modeler

[DataSet0]

Model Description

			Model Type
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	VAR00002	Model_2	ARIMA(0,0,0)
	VAR00003	Model_3	ARIMA(0,0,0)
	VAR00010	Model_4	ARIMA(0,0,0)
	VAR00004	Model_5	ARIMA(0,0,0)
	VAR00009	Model_6	ARIMA(0,0,0)
	VAR00005	Model_7	ARIMA(0,0,0)
	VAR00006	Model_8	ARIMA(0,0,0)
	VAR00008	Model_9	ARIMA(0,0,0)
	VAR00007	Model_10	ARIMA(0,0,0)

Model Summary

Model Fit

Fit Statistic	Mean	SE	Minimum	Maximum	Percentile 5	10	25	50	75	90	95
Stationary R-squared	,741	,323	,107	,998	,107	,115	,609	,871	,952	,995	,998
R-squared	,741	,323	,107	,998	,107	,115	,609	,871	,952	,995	,998
RMSE	,636	,606	,082	1,960	,082	,086	,175	,449	,929	1,902	1,960
MAPE	11,583	12,348	,491	34,286	,491	,531	1,471	7,295	21,307	33,961	34,286
MaxAPE	18,838	21,503	,725	66,676	,725	,787	2,174	11,494	30,897	64,359	66,667
MAE	,346	,330	,044	1,067	,044	,047	,095	,244	,506	1,036	1,067
MaxAE	,519	,495	,067	1,600	,067	,070	,142	,367	,758	1,553	1,600
Normalized BIC	-1,027	2,039	-4,278	2,078	-4,278	-4,197	2,794	,877	,515	2,009	2,078

Model Statistics

Model	Number of Predictors	Model Fit statistics: Stationary R-squared	Ljung-Box Q(18): Statistics	DF	Sig.	Number of Outliers
VAR00001-Model_1	1	,909	.	0	.	0
VAR00002-Model_2	1	,750	.	0	.	0
VAR00003-Model_3	1	,948	.	0	.	0
VAR00010-Model_4	1	,107	.	0	.	0
VAR00004-Model_5	1	,998	.	0	.	0
VAR00009-Model_6	1	,923	.	0	.	0
VAR00005-Model_7	1	,792	.	0	.	0
VAR00006-Model_8	1	,187	.	0	.	0
VAR00008-Model_9	1	,833	.	0	.	0
VAR00007-Model_10	1	,964	.	0	.	0

Audit Report Lags of Federal Statutory Bodies in Malaysia

Asmah Abdul Aziz, Fadlizawati Isa, Mohd Faidzal Abu

Abstract—**This** study examines the determinants of audit report lag (ARL) for Federal Statutory Bodies (FSBs) in Malaysia. Final samples of 92 FSBs during the period 2006 to 2010 are used in this study. This study examines firm size, leverage, profitability and auditor's comment to determine the ARL and four hypothesis have been constructed in this study The regression analysis was conducted to identify the relationship between firm size, leverage, profitability, auditor's comments and ARL. The findings suggest that auditor's comment highly influence ARL of FBSs. Firm size and profitability of the FSBs show a negative relationship towards ARL. This study also shown there is an improvement of audit delay in year 2009 and 2010. This aligned with culture of precision value which has been introduced by Malaysia Prime Minister, Datuk Seri Najib Tun Razak in Government Transformation Programme. Due to limited information disclose in the financial statements, future researcher can extend this study by looking at qualitative aspect.

***Keywords*—**Federal Statutory Bodies, Malaysia, Audit Report Lags

I. INTRODUCTION

Public sector is an organization and they are authorized by the public to manage their resources efficiently. In order to determine whether the public resources have been managed properly, Auditor General (AG) is appointed by the government to examine all their activities. Due to this, public sector organizations are required to keep proper and faithful accounting records. Federal Statutory Bodies (FSBs) which are corporations formed to carry out certain government duties are also required to keep proper and faithful accounting records. Similar to public and private sectors, FSBs must prepare proper financial reports about their organizations as this statement is a key instrument by which stakeholders can obtain information thus maintaining their trust in the organization.

Financial statements are instruments that provide information about financial position, performance and adaptability of an enterprise. Users such as investors will use the financial statements to assess the stewardship and decision making capabilities of management. According to Prime Minister of Malaysia, Dato' Sri Najib Bin Tun Abdul Razak, in this challenging world both private sectors and public sectors are required to play an important part in determining the growth of the economy (Economic Transformation Programme Update, July 2011).

As the public is one of the contributors to the government fund, they have a right to timely information about the company in making a decision. In the process of administering the transformation programmes, the timeliness of information is important and it will determine the quality of the decision made by the users. It is also an important area that the users of accounting information are concerned about (Afify, 2009). Lengthy reporting lag may relate to lower quality of information (Knechel and Payne, 2001). Research done by Abdulla (1996) revealed that greater benefit can be derived from the financial statement when the time lag between the end of accounting year and the publication date is shorter.

II. OBJECTIVES OF THE STUDY

Due to the issues being discussed earlier, this study is designed to meet two objectives.

1. To identify the trend of audit report lag of Federal Statutory Bodies.
2. To examine the factors that determine audit report lag of Federal Statutory Bodies.

Besides the public, government may have potential interest on this issue as they are responsible for monitoring the FSBs performance throughout the year. Sometimes problems in the

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organization can be detected by using timely audit report (Law P, 2009) and as a result, management can rectify the problems immediately. This will increase the performance of the organization and enhance public confidence towards the organization. Hence, quality information can be spread to the users in evaluating the FSBs' performance.

Since large organizations are expected to have good management, it is important for the users to determine the determinants of audit report lag (ARL). Therefore, period of audit lag has to be reduced. As such this study also aims to raise the issues on the determinants of ARL of FSBs.

FSB are formed to carry out government task in order to achieve government's mission and goals and it is independent of the government. However, government is still responsible to ensure that funds from the taxpayer are being used in efficient, effective and economic manner by FSB in carrying their operation. As clearly stated in the FSB legislation or according to Ministerial Function Act 1969 each FSB is controlled by Minister. The Minister is responsible to Parliament for the operation of all Government Boards and agencies. According to Retirement Fund (Incorporated) also known as 'KWAP' 2009, there are 118 corporations listed as FSB in Malaysia. Inland Revenue Board (IRB), Employee Provident Fund (EPF), Social Security Organization (SOCSO), local universities such as University Utara Malaysia, University Technology Mara and etc are examples of statutory bodies under the federal government.

Although FSB govern under its own Act, they are also required to have effective board of directors to monitor FSB's management and administration. Boards of directors under FSB are appointed by the Minister of Finance which the appointment is based on the proven track records of integrity, ability and reliability to undertake their responsibility. The board of directors under FSB consists of representatives from various stakeholders. These representatives consist of members who represent government, employers, employees and professional members from various backgrounds. The combination of these directors will lead to competence and a strong ability of the directors in discharging their duties effectively. The appointment and termination of the board's members are controlled by respective Minister.

The annual reports of FSBs were gathered from Parlimen. Besides annual report, the auditor's certificate issued to FSBs also has been selected in order to determine the ARL.

III. AUDIT REPORT

A. Audit Report Lag (ARL)

Financial statements are the products of financial reporting which are being used by the corporation to deliver information to the users. These enable users to better infer the reality of a corporation's financial performance and position. This indicates that it is important for corporations to provide quality financial report to the users. The quality of disclosure in corporate annual report and account has been represented in the literature by several construct including adequacy (Buzby, 1974), comprehensiveness (Barrett, 1976) and informativeness (Alford et al, 1993). Another characteristic of quality disclosure is timeliness. Henderson and Kaplan (2000), gap between financial year end and date of auditor's report is referred to as the 'audit report lag'.

In a public sector, government servants play an important role in carrying their duties for their superior. These include their duties in communicating economic events of the government to the users including public in order to determine the effectiveness and efficiency of the individual in performing their duties. This is different from Public Listed Companies (PLC) as public servants are responsible to the public as a whole. In certain countries, concept of accountability is very important in the organization including public sector. Recent study by World Bank indicates there is strong relationship between good governance and good government performance. This requires the government to have high standards for governance and accountability.

However, this accountability differs depending on the organization whereby the public sector has been criticized for inefficiency, ineffective accountability and poor performance. To overcome these problems, National Audit Department (NAD) requires their staff to comply with quality standard MS ISO 9001: 2008 in carrying their duties. This standard requires auditor to carry out their duties within four months. Audit report is an auditor's opinion about the accuracy of government financial statements.

According to Governmental Accounting Standards Board's (GASB) 1987, Financial reporting should be able to assist users in determining the level of services that can be provided by the government organization and its ability to pay its liabilities as they become due.

IV. THEORY

A. Shareholder Theory

1Malaysia campaign which was launched by Prime Minister, Y.A.B Dato' Sri Najib Tun Abdul Razak on 3 April 2009 revealed that government tries to create better value to their stakeholders. By having good governance in FSB, stakeholders' interest can be protected. This can be explained by stakeholder's theory. Phillip and Freeman, (2003) discussed the stakeholder theory as:

"a theory of organizational management and business ethics that address the morals and values applicable to managing an organization."

B. Agency and Accountability Theory (Stewardship)

In a recent year, there is great pressure towards better accountability within public sector entities since it shows the effectiveness and efficiency of the organization in managing public resources. According to Rohaimi (2011); Hughes (2003); Chapman (2000) public sector is accountable to their superiors, political leadership and public at large in managing public fund and maximizing their wealth. It is public sector responsibility to report their activities to the public and provide justification on what they have done. Accountability

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of public sector in carrying their duties is communicated to the public through financial statement. This is stated clearly in the Concept Statement No 1 of Governmental Accounting Standards Board's (GASB).

Agency theory also suggests that agency costs arise when there is conflict of interests between principal and agent. In public sector, agency cost arises when public sector fails to fulfil public's demand. It shows agency cost is an expense to the public. Many researchers have been done on accountability and agency theory in private sector and this study attempts to apply accountability practices and agency theory perspective in the FSB.

V. MEASUREMENT OF INDEPENDENT VARIABLES

Figure 1. Theoretical Framework for Determinants of Audit Report Lags of Federal Statutory Bodies in Malaysia

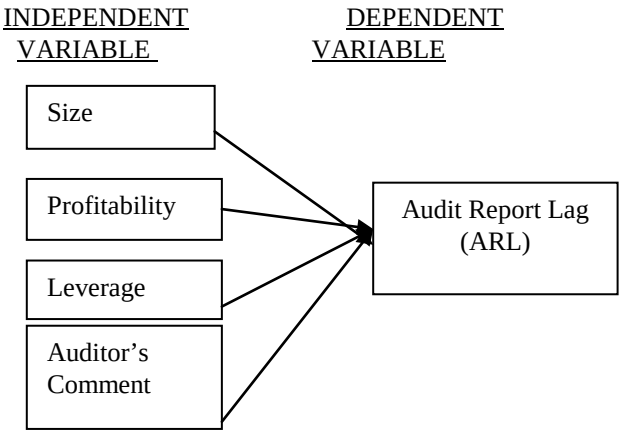

Figure 2. Sample Selection

List of FSB at the end of 2010	118
Less	
FSB where annual reports not available in the Parliament's record	(13)
Less	
FSB which does not meet the criteria	(13)
Final sample	92

A. Size

For local authorities', Rubin (1992) found that special interest group exists in the larger cities may give high pressure to government officers to provide timely reports. Municipal financial statements are the only information available for the public to determine municipal's financial position. Therefore, shorter ARL is expected. Prior investigation by Payne and Jensen (2002); Mclelland and Giroux (2000) shows municipal size also has an influence on audit delay. Positive relationship is predicted for size of population and ARL (Bamber et al, 1993).

H1 – There is a negative association between ARL and FSB size.

B. Profitability

The importance of LA financial reporting as a medium to provide information to public users has been discussed by many researchers (Collin et al, 1991; Tayib, 1994). A study by Tayib, Hugh and Ameen (1999) revealed that Malaysian taxpayers has an interest in reading annual report especially on statement of income and expenditure as it discloses relevant information on the disbursement of taxpayer money. Declining income for LA is a signal of management conflict in managing taxpayer money. This requires AG to increase audit effort and perform their audit carefully in order to maintain public confidence towards government in managing their money. However study by Annaert et al (2002) found that no relationship exists between profitability and ARL.

H2 - There is negative relationship between ARL and FSBs' profitability.

C. Leverage

As PLCs, FSBs also can incur large debt in building and maintaining their infrastructure and provide service to public. FSBs with high leverage are expected to have high agency cost. Thus, a high quality audit service is required to satisfy the need of users especially public as a whole. Information on financial positions of the government is important to government bondholders in determining the ability of LA to pay the debt. This requires LA to provide quality information by increasing their monitoring on municipal performance. Increase in audit efforts will lead to lengthy audit engagement (Jensen and Meckling, 1976).

H3 – ARL is significantly and positively associated with level of FSBs' leverage.

D. Auditor's Comment

According to Lys and Watts (1994), auditor's remarks also may lead to increase in ARL because auditors might try to protect themselves from any potential legal action by taking more time to audit the errors. Remarks or comment by auditor is expected to convey bad news about the organization (Whittred, 1980). In the case of FSBs, bad news will have a huge impact on the public as they are a contributor to the Malaysia's economy. Based on the above discussion, this study argues that the auditor's comments are likely to increase audit delay. Therefore the following hypothesis is proposed:

H4 – ARL is significant and positively associated with auditor's comment.

VI. REGRESSION MODEL

Based on previous model employed by Ashton (1989) and Carslaw and Kaplan (1991) a model of audit delay is

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developed. The regression model is used to test the association between dependent variables and ARL. The model is as follows:-

$$ARL = \beta0 + \beta1 (SZ) + \beta2 (PROF) + \beta3 (LEV) + \beta4 (ADCMNT) + \epsilon$$

Where β0, the constraint coefficient of regression; β1 – β4, regression coefficient of independent variables; ϵ, random error term.

ANALYSIS OF FINDINGS

Table 1. Summarize the descriptive result for Audit Delay for 2006-2010

	2006	**2007**	**2008**	**2009**	**2010**
N	92	92	92	92	92
Mean	181.15	187.33	189.23	179.88	179.10
Median	196.00	206.00	207.00	186.50	185.50
Std. Deviation	51.214	49.942	50.808	51.963	51.435
Skewness	-.980	-1.220	-1.276	-.602	-1.063
Minimum	29	25	23	21	18
Maximum	284	278	241	332	237

Table2. Descriptive Statistics: Independent Variables

	SZ	PROF	LEV
Mean	8.0147	.3195	7.0368
Median	8.0550	.3100	7.0850
Std. Deviation	.88689	.14600	1.05225
Skewness	-.189	.266	.003
Kurtosis	.460	-.439	.550
Minimum	5.35	.00	3.75
Maximum	10.39	.74	10.36

Before conducting the Pearson Correlation analysis, the independent variables are examined to ensure normal distribution of data that need to be performed. Data is said to be normal if the standard Skewness is within the range of 1 and -1, while for standard Kurtosis data has to be less than 3 (Pallant, 2003). Based on Table 1 and Table 2 above, all data are normally distributed according to each variable.
Relationship between variables in this study is tested using Pearson's correlation. A positive value in the correlation implies a positive association while negative value implies negative association. This analysis is important in describing the strength and direction of the linear relationship between two variables (Pallant, 2003).

Table 3. Pearson's Correlation between Dependent and Independent Variables

	DAYS	SIZE	LEVERAGE	PROFIT	AC
DAYS	1	-0.56	-.048	-.057	.115*
SIZE	-.056	1	-.002	.742**	-.031
LEVERAGE	-.048	-.002	1	-.018	.122**
PROFIT	-.057	.742**	-.018	1	.000
AC	.115*	-.031	.000	.000	1

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Notes:
DAYS is measured by number of days between the date of financial statement and the date of auditor's report.
SIZE is measured by natural logarithm of year-end total asset.
LEV is measured by proportion of total debts to total assets.
PROFIT is measured by natural logarithm of the net income for the year.
AC is measured by using dichotomous variable of (with auditor's comment) and 0 (no auditor's comment).

Table 3 above shows the Pearson correlation analysis result between the variables for this study. The result indicates that there is a positive linear correlation between auditor's comment (AC) with audit report lag (DAYS) and this supports hypothesis (H4). It shows that auditor's comments on FSBs' financial statements are significant against the delay of auditor's report. According to Lys and Watt (1994); Houghton and Jubb (1999) errors or irregularities found in the financial statements require auditor to spend more time and effort in performing additional audit procedures in order to provide true and fair view reports to the users. These results also support agency and accountability theory where auditor spends more time to investigate the weaknesses in the FSBs' financial statements. This leads to an increase in the ARL.

However, result of correlation between DAYS and firm size (SIZE) indicates that there is negative linear correlation. This relationship also can be proven through the study done by Carslaw and Kaplan (1991); Henderson and Kaplan (2000); Wermer et al (2000); Ahmed (2003); Ku Ismail and Chandler (2004) and El Banany (2006). Larger FSB tends to report quickly than other FSB due to good governance and strong internal control. Since FSBs are responsible for managing public fund, therefore FSB may receive high pressure from public and this will lead FSBs to provide timely reports. This finding supports hypothesis (H1) which has been discussed in the previous chapter.

Table 3 above also shows there is negative relationship between DAYS and leverage (LEV). This finding shows the FSBs with higher leverage tend to provide timely report

to the users. However, this finding is contrary to hypothesis (H3) and prior study by Carslaw and Kaplan (1991); Owusu-Ansah (2000); Boonlert-U-Thai et al (2002) and Conover et al (2007) where they found there is positive relationship between leverage and timeliness. On the other hand, negative relationship between DAYS and profitability (PROF) supports hypothesis (H2). According to Courtis (1976) and Kinney and McDaniel (1993) company with declining profit tend to have longer ARL. The same goes for FSBs where Malaysian taxpayers are more interested in reading FSBs' annual report as it discloses relevant information on disbursement of taxpayers' money (Tayib, Hugh and Ameen, 1999). Declining income of FSBs is a signal of management conflict in managing taxpayers' money and this requires AG to spend more time to conduct audit in order to maintain public confidence towards FSBs.

Furthermore, based on the correlation analysis above there is a negative linear correlation between SIZE and LEV, but positive linear correlation between LEV and AC. The result indicates when SIZE increases, LEV of the FSBs shall increase. Table above also shows there is no relationship between PROFIT and AC.

VII. CONCLUSION OF STUDY

Timeliness of financial reporting is important because it provides valuable information to the public. Since public is the main contributor to the government fund, they have right to access quality and timely information. Relevancy of the information will reduce due to increase in reporting lag. Thus the decision made by users might not be of superlative quality. This study extends prior research by examining whether size f statutory body, leverage, profitability and auditor's comment affect ARL of FSBs. The findings of this study provide new insight into the determination of FSBs audit delay. To conduct this study, a total of 92 FSBs have been selected.

Result of the study indicates that range of ARL for FSBs from a minimum interval of 18 days to a maximum interval of 332 days. This study also shows there is an improvement of audit delay from 2008 to 2009. Finding from this study also agrees with prior research where auditor's comments affect the ARL (Lys and Watts, 1994). Furthermore, annual report of FSBs will be tabled in Parliament by respective Minister and public gives more attention to auditor's report because it reflects the government accountability. Thus, to provide quality information to the users, the auditor is required to carry additional audit procedures (Houghton and Jubb, 1999). FSBs size and profitability of the FSBs show negative relationship with ARL. This is due to strong internal control and good corporate governance (Carslaw and Kaplan, 1991).

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Manager of educational project and his competences

K. Hrazdilová Bočková, M. Hrvolová, M. Polčáková, D. Maťovčíková

***Abstract* —** It is especially desirable for the project-oriented activities to be conducted and managed by people with relevant knowledge and experience. Synchronously this knowledge and experience must be appropriately used in the context of the department and the situation. Competencies of project managers should cover a fairly wide range - from a purely technical skills (such as the use of specific methods and tools), through behavioral and social, to systemic and contextual. At the same time any project manager cannot work without the corresponding "hard" skills, respectively experience from the field, where he leads or manages his project. Competencies of project managers could be identified, organized and described (a competency model), developed (training, experience, mentoring, coaching), and naturally also assessed and verified (practice, certification certificate). The aim of the paper is to present the draft of a competency model of a manager of educational projects that will be primarily used in educational institutions. The paper consists of two parts. The first part focuses on the basic terminology issues anchoring concepts such as competence and the competency model. The second part is devoted to the description of a specific proposal for the specific competency model and its subsequent presentation and verification.

***Keywords*—**communication, competency model, education sector, project manager competencies.

I. Introduction

Nowadays, many organizations are trying to work in joint projects with other organizations, thus creating strategic partnerships, alliances, loosely connected teams that passes through several organizations, including organizations competitive. The more and more we are faced with cooperation channeled towards humanity, which creates either small or growing groups joined by people. These groups of people are usually working in systemically sophisticated organizations. Their activities cover wider areas and uncover additional opportunities for action. This trend leads to a deeper linking of human activities areas. The human qualities, which are essential for humanizing trend, are found in physicians, streetwalkers, nurses, academics and social worker etc.

There is diversity in education, personality types, race and ethnicity inside each group that can generate differences. Each group has its own culture which can be obvious once the job is changed and the person gets into a new environment. Nevertheless, the team can work effectively with others regardless of profession.

Many specialists with different abilities participate in projects particularly in special and complex projects. These people form a project team headed by a project manager. He is chosen by senior management of the company. His task is to be a leader, a planner, and an organizer, a coordinator of teamwork, a controller and a negotiator in one person.

The project manager leads (not performs) all work in the team. One of his core competencies is to manage people who are in project realization, to oversee and monitor processes, to represent the project outward, to deliver necessary resources, to improve all communication and project team motivation and so on. In addition he can divide the duties between the project personnel who are working on the problem as one team.

The particularly important ability of a project manager is to influence other team members. His capability to lead depends more on the art of motivation than jurisdiction regardless of the extent project team members are subordinate to him. As projects are very often not a routine matter, project managers are frequently forced to solve any project tasks creatively. In the book *Successful project manager* (Newton, 2008, p. 25) the project manager is considered to be a person who has responsibility for delivering all project components. It could be a full time job or just the role in the situation.

This job is suitable for someone who knows how to improvise, to make fast decisions and can see the problem in a broader context. He can also solve most of the nonstandard or unplanned condition or influences which happened either unexpectedly or could be a result of risk factor effects and project changes. A comprehensive approach in performance of the project manager role assumes qualifications and skills of professional performance of project work, process management, relationship with people, art to motivate and encourage, analytical and synthetic knowledge needed for evaluation. The evaluation is based on comparison current status of the project against the plan and draft conclusion with regard to potential effect of risk factors. This wide range of the project manager activities requires qualification, necessary experience and a great deal of talent.

The primary objective of this paper is to present the project manager competency model of educational projects. The formation of a competency model is achieved by improvement and reformulation of personal strategy formulation of educational institutions. One of the strategic objectives of educational institutions is to create functional competency model for job positions which are going to facilitate the personnel management especially the process of personnel selection, motivation, evaluation and employee development and dealing with increased employee turnover. According to (Hrazdilová Bočková, 2012), (Hlásna, 2008) or (Geršicová, 2007) the management of educational institutions concluded

that the process of personnel management does not work according to those needs of the institutions that has been originally set towards. It is one of the major priorities for the next period to proceed to functional personnel management. The resort out of this situation is to create functional competency models.

The presented competency model should assist in the effectiveness of project manager tasks throughout performance management processes carried out. Competences are going to be determined, together with their basic level and their higher level which should be reached at some point. By assessment of certain competencies which are tied to the job, we can laid the foundation for a competency model and later include also specific competencies related to the specific institutions which may be changeable once another institution is interested in using the competency model.

Why is the paper focused on presentation of the competency model formulation as an effective way of need for changes in personnel management system in educational institutions? The reason is that the usage of competencies and competency models represents still underrated tool of comprehensive and holistic way of managing people in the organization. There is the assumption that the competency model of the project manager position will be of a benefit and an advantage for educational institutions in case of any future planned adjustments in personnel management.

While creating own competency model, an emphasis was put on its usability in the practice of educational institutions and its portability to other organizations if necessary.

II. Overview of the Current State of the Topic

A. Terminological anchoring of competence issues

The term competence is known and used in general, but not always in the same meaning. Competencies are perceived as an opportunity to comment on some problem or the power to make a decision for the general public (he is in the eyes of others considered as competent). Experts in the field treat a term competence more as a character, knowledge, skill, experience and quality, as "a set of certain conditions for specific activity that supports the achievement of a goal." (Veteška and Tureckiová, 2008, p. 25).

Kubeš, Spillerová and Kurnický (2004, p. 14-15) mention that Boyatzis already stressed the difference between a task that must be met and abilities that an employee must have in order to fulfil the task well. This division therefore distinguishes between what we do (the result of our business) and how we behave to fulfil the task perfectly.

According to Hroník (2008, p. 24) distinguishing results and ways leading to these results allow us much better to manage the process and performance. If we know which competencies should be included in the functional competency model of the employee, it can be useful for him and the whole institution because it helps in their development to improve performance.

Kubeš, Spillerová and Kurnický (2004, p. 16) state that one of the ways how accommodate the term of competence is Woodruff´s concept. He sees under this term the "umbrella" which covers everything that may be directly or indirectly related to work performance. He sees competencies as a set of worker behaviour which has to be used in the position to handle the tasks competently.

If we say that a worker is competent (he performs assigned tasks to good or excellent level) this implies the following three assumptions (Kubeš, Spillerová and Kurnický, 2004, s. 16):

1) He is internally equipped with features, capabilities, knowledge, skills and experience which conduct such essential needs.
2) He is motivated to use such behaviour; he sees value in the desired behaviour and is willing to spend the necessary energy this way.
3) He can use behaviour in the environment.

In the above, it is possible to work well with the first assumption because knowledge and skills can be developed. The second assumption is regarding to the motivation for position of man, his value and beliefs (belong to the stable component of human personality) which are influenced far more difficult. While the third assumption is the external condition, it significantly affects the two mentioned above.

The views and conception of the term of competence are many, experts still have different opinions on what is exactly hiding under this term but the essential fact remains that the term of competence is and will continue to be linked to the process and behaviour leading to the desired performance.

B. The competency model

A competency model expresses in varying degrees of details and factual summary combination of knowledge, skills and other personality characteristics which are needed for effective performance of assigned tasks within the organization. These combinations are subsequently structured into different sized units which can be referred to as a system, map, profiles and lists of competencies or a competency anchor. Which model of these arrangements eventually emerges, depends on the specific intentions of specific institutions (Kovács, 2009, p. 49).

"*Competency model is not the way of the standard creation but the way to diversity management and performance*" says Hroník (2007, p. 64) which further indicates the general advantages of introducing a competency model. The most important advantage of the competency model is in its capability to create a bridge between business strategy and human resources strategy. A competency model is also a connection between the values of the institution and the job description. Institutions usually have one set of values whether written or unwritten, governing. There are many job descriptions of specific positions by individual and small companies sometimes as much as employees. According to

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Hroník (2007, p. 68) even in this case "a *competency model is a practical tool for connection*".

There are many ways of competency models typology and classification and it depends mainly on the intentions of the company which competency model arises. One of the highlights is broken down by Kubeš, Spillerová and Kurnický (2004, p. 60 - 62) who divide competency models into: *models of core competencies, the specific competency model,and the generic (general) competency model.*

There are several approaches used by institutions while creating competence models. According to Kubeš, Spillerová and Kurnický (2004, p. 60 - 62) these approaches were divided by Rothwell and Lindholm to: *prescriptive (borrowed) access, a combined approach, and access tailored approach.*

Each of these approaches has its pros and cons. Managers of human resources departments should be aware that the most appropriate approach is the one that reflects their expectations and intentions the best. From the practical point of view there are two considered possibilities. Either the institution has an interest to sum up key competencies which characterize the extraordinarily successful managers in the present state of institutional development or intends to take into account future expectations of the institution in terms of managerial behaviour while identifying competencies.

C. Conclusion and theoretical discussion

In the paper we use the above concept of competence by Hroníková (2008, p. 23 - 26). However, each of the competency concepts has a relevance leading to the formation of the present competency model.

We can talk about a competence when it is related to a particular task, position or function. If we know the requirements and demands for a given position, we can derive a required competencies from them and group them into the competency model of a given work position (Kubeš, Spillerová and Kurnický, 2004, s. 27).

Division of competencies is according to Boyatzise in (Kubeš, Spillerová and Kurnický, 2004, s. 27) very similar to a suchlike division of Prokopenko and Kubra (1996, p.25 -27) into the technical competence, behavior and manners. Mostly subconsciously we automatically divide competencies into the basic skills which a worker shall "bring" in his position and the competencies related to performance, respectively behavior which leads to effective performance.

Armstrong's concept of competency division in (Kovács, 2009, p. 19 - 20) is then beneficial for the job thanks to his typology division in which generic competencies divisive figure in the universal and competencies within the institution. This division is reflected in the present intent to create a competency model to use with slight modifications in multiple organizations. In order to ensure this model will subsequently operate it is necessary to include such competencies. The development of higher performance is achieved by a worker at a given position.

The base for the creation of a competency model consists of competencies' identification. Purposefully identified and defined competencies which are needed for effective implementation of the objectives and tasks of the institution, result in several comprehensive compilation units which can be described as a group or a type of competencies and these subsequently merge into a comprehensive competency model (Veteška, 2010, p. 142).

Well established competency model should be functional and can be in operation when it will have the characteristics specified in (Hroník, 2007, p. 71 -72).

III. SPECIFICATION OF BASIC TERMINOLOGY

In the case of the creation of a competency model we consider a project that trains project staff in the organization where funding was obtained from the European Union grant. This project is always unique, inimitable and has a different temporary project team so according to Němec (2002, p. 11) entirely fulfils the definition of the word perception project.

The product of the project where a project manager is in charge will improve the knowledge and skills of employees and thus also subsequent performance improvement of business processes which is the reason why educational projects exist. They assist companies to improve the skills and develop the competencies of their staff that it contributes to greater work efficiency of the people development in the organization and development of society itself. The project manager must have this fact in mind for the whole duration of this project and shall try to contribute through his actions to meeting the project objectives and desired outputs. Based on subdivision of specific activities to attain a specific objective (product) we can determine competency within the competency model of this job.

An analysed project manager will focus his activities on managing his own particular project within a company, thus he addresses the implementation phase (implementation) of the project.

IV. METHODOLOGY

There are many techniques for identification of competencies but all can be simply divided into five stages according to Kubeš, Spillerová and Kurnický (2004, p. 46). This division is a major methodological procedure of processing the presented project manager of a competency model in educational projects.

A. Preparatory phase

This phase foregoes own competencies identification and is conducted through structured interviews with managers in strategic positions and accompanied by material study.

B. Phase retrieval

After obtaining the outputs of the preparatory phase one could reach a decision on the concept of collecting the

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underlying data and methodologies used on the basis that during the preparatory phase were obtained answers the following questions:

1) "Why" (why it is necessary to create a competency model)
2) "How" (which approach we use in order to form the model)
3) "Who" (who or what is the source of information for the development of a competency model).

C. Phase analysis and classification of information

At this stage the data are processed using consecutive steps defined in (Kubeš, Spillerová and Kurnický, 2004, p. 55 - 56). These are:

1) Description of individual behaviours appropriate for the position.
2) Identification of specific information that contribute to successful or unsuccessful performance (the result represents a relevant selection and selected should be only those records that can be a source of the creation and description of competencies).
3) Classification of the individual statements into groups called competency topics and to analyse further a classification process in order to create a homogeneous units (competence anchors) which have subsequently form the basis of competence and their manifestations.
4) Verification of acquired data on a broader sample of respondents in the last step. Individual statements which have been classified in the third step are revised by a questionnaire method. This helps to obtain information about the need for individual expression or a completed competence in a given position. This information will be important later for the final decision on competencies classification into the competency model.

D. Description and creation of competencies and competency model

Within the analysis and classification of information, we can speak of a competencies'sketch that we get by clustering of related behaviour types. Therefore these were subsequently elaborated in a more accurate characterization of competence so as accurately and comprehensively describe behaviour that characterizes it. One needs to create a scale and describe the various manifestations of competence according to the level of its development. Description of each level begins usually with negative behavioural features within a given jurisdiction and continues through weakly developed level to abnormal levels indicating the high level of competence development. All grades must be mutually distinguishable.

E. Preliminary competency model

The model presented here will be validated and verified through the process steps performed within the project KEGA - 003DTI-4/2014.

Table 1 Competency topics

COMPETENCY	RATING SCALE
GOAL ORIENTATION	**Basic**: tries to do his job well and fulfils the objectives of the project **Advanced**: tries to find actively a way to achieve his goals better, faster and more efficiently **High**: sets challenging objectives and deliberately works on achieving them, seeking opportunities to improve results, considers the benefits and risks of the newly proposed solutions
PROJECT KNOWLEDGE AND SKILLS	**Basic**: the basic information from the knowledge of project management and ability to apply knowledge **Advanced**: he can find his way in project issue very well, has considerable experience which can be used for maximum efficiency of his business **High**: has in-depth knowledge of project issue, his experience is shared with colleagues and uses the knowledge and skills in order to prevent any problems
ACTIVE AND CREATIVE APPROACH TO WORK	**Basic**: he can obtain the necessary information for his work and then use it in order to pursue its stated objectives met within the time limit, in an unexpected situation carefully thinks over other options on how to proceed **Advanced**: works with information efficiently and flexibly, can improvise when the planned procedures collapses, he proactively manages his time in order to work on his tasks and tries to meet its targets well before stated time, can come with new ideas **High**: always tries to be one step ahead as with the use of information and new ideas and opportunities to improve his business, his thoughts and ideas actively acquires his peers
SYSTEMACY AND ACCURACY	**Basic**: recognizes the importance of quality is rigorous, is interested in the tasks completions. **Advanced**: check his work and the accuracy of the information, tries to avoid errors, often compared to own work with the required standards. **High**: thoroughly ensures the quality of his work and the work of others after each check or control, performs, evaluate and discovers weaknesses or missing information and identifies areas for improvement, he achieves high quality standards.
MANAGERIAL SKILLS	**Basic**: handles routine management activities at a basic level if necessary, consult with other colleagues. **Advanced**: decides and manages independently, maintains communication in the team and works on his further development **High**: has extensive experience in leading teams, can handle all situations, has a natural authority and his team is working without problems
COMMUNICATION SKILLS	**Basic**: is able to receive and actively share relevant information with colleagues, internal and external partners/clients **Advanced**: takes the initiative in communication, encourages others to communicate, actively encourages communication in meetings, communication tends to maintain positive relationships. **High**: the maximum use of formal and informal channels of communication, actively taking steps to minimize the communication.
COMMITMENT	**Basic**: is loyal to his business and corporate culture. **Advanced**: shares corporate values with positive internal beliefs and shares his information with others. is willing and able to serve performance beyond the standard. **High**: is an embattled initiator sharing corporate values, actively persuades others into fellowship with the company and its values.
PERSONAL RESPONSIBILITY	**Basic**: is independent within the assigned tasks and able to take responsibility for his decisions. is friendly to the ideas of his skills development. **Advanced**: works independently, very well stress-resistant and manages challenging situations, empathetic, has commitment to his personal development.

(Source: own elaboration)

V. RESULTS

The first step identified clear patterns of behaviour which shows a successful project manager in his work. We proceeded from a long own experience and also from the job description anchored within the corporate documentation. These behavioural types were divided into topics in which the individual behavioural features were clustered into homogeneous units, from which all individual competencies were subsequently profiled (see Table 1).

Individual competencies which emerged from obtained data were again compared with the description of the job and verified if adequately correspond with requirements of a project manager position. A follow-up control confirmed them as satisfactory. Four- rating scale (an inadequate level, a basic level, an advanced level, a high level) was used for a specific description of competencies (see Table 2). An insufficient level is no longer listed for specific competencies for the reason that the model is made for a suitable candidate of a

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project manager who will meet at least the basic level and could be accepted for this position.

Table 2 Scale of competencies

COMPETENCY	RATING SCALE
GOAL ORIENTATION	**Basic:** tries to do his job well and fulfills the objectives of the project **Advanced:** tries to find actively a way to achieve his goals better, faster and more efficiently **High:** sets challenging objectives and deliberately works on achieving them, seeking opportunities to improve results, considers the benefits and risks of the newly proposed solutions
PROJECT KNOWLEDGE AND SKILLS	**Basic:** the basic information from the knowledge of project management and ability to apply knowledge **Advanced:** he can find his way in project issue very well, has considerable experience which can be used for maximum efficiency of his business **High:** has in-depth knowledge of project issue, his experience is shared with colleagues and uses the knowledge and skills in order to prevent any problems
ACTIVE AND CREATIVE APPROACH TO WORK	**Basic:** he can obtain the necessary information for his work and then use it in order to pursue its stated objectives met within the time limit, in an unexpected situation carefully thinks over other options on how to proceed **Advanced:** works with information efficiently and flexibly can improvise when the planned procedures collapses, he proactively manages his time in order to work on his tasks and tries to meet its targets well before stated time, can come with new ideas **High:** always tries to be one step ahead as with the use of information and new ideas and opportunities to improve his business, his thoughts and ideas actively acquires his peers
SYSTEMACY AND ACCURACY	**Basic:** recognizes the importance of quality is rigorous, is interested in the tasks completion. **Advanced:** check his work and the accuracy of the information, tries to avoid errors, often compared to own work with the required standards. **High:** thoroughly ensures the quality of his work and the work of others after each check or control, performs, evaluate and discover weaknesses or missing information and identifies areas for improvement, he achieves high quality standards.
MANAGERIAL SKILLS	**Basic:** handles routine management activities at a basic level if necessary, consult with other colleagues. **Advanced:** decides and manages independently, maintains communication in the team and works on his further development **High:** has extensive experience in leading teams, can handle all situations, has a natura authority and his team is working without problems
COMMUNICATION SKILLS	**Basic:** is able to receive and actively share relevant information with colleagues, internal and external partners/clients **Advanced:** takes the initiative in communication, encourages others to communicate, actively encourages communication in meetings, communication tends to maintain positive relationships. **High:** the maximum use of formal and informal channels of communication, actively taking steps to minimize the communication.
COMMITMENT	**Basic:** is loyal to his business and corporate culture. **Advanced:** shares corporate values with positive internal beliefs and shares his information with others, is willing and able to serve performance beyond the standard. **High:** is an embarked initiator sharing corporate values, actively persuades others into fellowship with the company and its values.
PERSONAL RESPONSIBILITY	**Basic:** is independent within the assigned tasks and able to take responsibility for his decisions, is friendly to the ideas of his skills development. **Advanced:** works independently, very well stress-resistant and manages challenging situations, empathetic, has commitment to his personal development. **High:** works independently and his good experience shares with others less experienced colleagues, uses all his personal property for the benefit of business, locates opportunities and resources for his development and the development of others.
PROACTIVITY (THINKING OF OPPORTUNITIES)	**Basic:** perception of a situation or a problem that needs to be urgently addressed tries to resolve the situation himself or informs others about steps needed to be taken. **Advanced:** detects any opportunity, uses them or turns the attention of others so that they can be used, he thinks about the certainty that the problem is not repeated or look for how to utilize the opportunity. **High:** seeks opportunities in advance or estimates them, takes steps to make them work, anticipates and prepares for possible problems that are not obvious to others and makes every effort to avoid them in advance.

(Source: own elaboration)

The basic level of competence is given by the minimum required knowledge and skills which should the worker have if he ever wishes to hold the position. Another two stages are then distinguished by the behaviour of individuals in the context of the requirements for the competence, respectively given competence that can be developed from the basic level to advanced level and then at a high level of competence.

We picked this type of scale because it is very clearly stated what are the minimum requirements for admission to the position of project manager and how these skills can be developed from the basic level to high. Anything that did not reach even the basic level is insufficient. The possible employee potential would be then weighted by a recruiter in a particular company once he considers for a job position anyone with an insufficient level of competence.

VI. Conclusion

Even if a quality level of project management is elaborated in detail with the use of methodologies and rules, the result fully depends on the people who make up the organizational structure of a particular project. Although it is important for the daily management to fill up individual sub-tasks which are the result of individuals or small work groups, the overall success of the project and the achievement of the set objectives are significantly dependent on the cooperation of the entire project team. The project team often accounts for a group of specialists of the company from other departments that could have previously worked temporarily on any project or not at all. Also, the uniqueness of the project in a sense of its originality without any previous imitation emphasizes the clear allocation of managerial authority and decision-making skills. The role of a project manager becomes more important in such an environment. For all these reasons, each project, as well as every other business group or its organizational structure, have their own rules of decision-making, hierarchical rules of negotiation and authorization and hierarchical system of sharing responsibility from partial results to global objectives of the project .

The primary aim of the paper was to create a competency model and the target has been reached. The competency model might be usable in educational institutions. Its creation shall assist in more efficient management of the staff as competencies will more accurately reflect their corporate activities. It will help to improve the selection of new employees, to find a more suitable method of their evaluation (followed by development opportunities and professional growth) and thus to set also more suitable incentive system. At the same time however, this model will be widely used also by any other institution engaged in project management of educational projects.

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The Assessment of The Comparative Efficiency of The Reforms for Different Groups of Countries

Samson Davoyan and Tatevik Sahakyan

Abstract**—** The purpose of this article is to suggest a new methodology that will give us an opportunity to create an Integral Index of Reforms (IIR) that will include seven indexes: KOF Index of Globalization, The Democracy Index, The Corruption Perception, The Human Development, Doing Business, The Global Competitiveness Index and The Index of Economic Freedom.

Keywords**—** Competitiveness, democracy, efficiency, reforms, development, economic growth, corruption.

I. Introduction

In different countries of the world various reforms are implemented objectively, which pursue the aim to improve the quality of the life, increase the rating of the country and also provide the sustainable development of the country in the future [1]. On the purpose of our research we consider more important the following indexes, as their integrity will represent the features of the social-economic development of each country. From this point of view, during the last decades there have been various indexes developed by different international organizations and non-government corporations (KOF Index of Globalization by the Economist Intelligence Unit, Human Development Index by UNO, The Corruption Perception Index by Transparency International anti-corruption organization and so on), which are used to assess the institutions of different fields. Based on the new methodology, suggested by us, we have tried to create more integral index based on the following indexes, which trend will give an opportunity to assess the comparative efficiency of various reforms for different countries (24 countries in transition, 15 developed and 10 least developed countries). We have splint the countries into 3 main groups. We have highlighted the reforms implemented in 15 developed countries: Austria, Belgium, Denmark, Finland, France, Germany, Japan, Netherlands, Norway, Portugal, Singapore, Sweden, Switzerland, United Kingdom and United States.

We have also assess the comparative efficiency in 24 countries in transition countries during post-crisis period. These countries are Albania, Armenia, Azerbaijan, Bulgaria, Cambodia, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, Ukraine, Vietnam. We have also chosen 10 least developed countries: Bangladesh, Benin, Côte d'Ivoire, Gambia, Lesotho, Mali, Nepal, Senegal, Uganda and Zambia.

The integral index consists of seven indexes for the last 4 years: KOF Index of Globalization for 2010-2013, Democracy Index for 2008, 2010, 2011 and 2012, The Global Competitiveness Index for 2010-2011 and 2013-2014 periods by World Economic Forum, Doing Business for 2011-2014, Corruption Perception for 2010-2013, The Index of Economic Freedom for 2010-2013, The Human Development for 2009-2012.

Our new methodology is based on two regulator-parameters: the changes of the ranks and average of scores of the above mentioned indexes for two periods of time. As a result we have the Integral Index of Reforms.

II. Statistical Review

The integral index describes the social-economic development level and through it we assess variety of reforms for 2009-2013. On this purpose we have suggested a new methodology for the assessment of the Integral Index of Reforms based on seven different indexes.

A. The Global Competitiveness Index (GCI)

The Global Competitiveness Index (GCI) released by the World Economic Forum, which is a comprehensive tool, that measures the competitiveness of 148 countries, contains 3 sub-indexes: basic requirements, efficiency enhancers, innovation and sophistication factors, that are based on 12 pillars (institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, etc.) including 119 indicators[2].

B. Doing Business

Doing Business released by the World Bank and International Financial Corporation assesses business activity for 189 countries on the basis of 10 areas of regulation (starting a business, dealing with construction permits, getting credits, paying taxes, etc.) with 36 sub-indexes considering the survey results of organizations in different sectors of economies [3].

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C. The Corruption Perception Index

The Corruption Perception Index published by Transparency International anti-corruption organization measures the perceived levels of public-sector corruption for 177 countries based on different assessments and business opinion surveys [4]. The countries, included in the rank of The Corruption Perception Index, are classified on a scale of 0 to 100. The countries, that get 0 are the highly corrupt in judicial system, media, legislative, police, business, public, educational, military areas [5].

D. The Index of Economic Freedom

The Index of Economic Freedom assesses the economic freedom of countries through 10 indicators (Business Freedom, Trade Freedom, Fiscal Freedom, Government spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom from Corruption, Labor Freedom) in 185 countries [6]. All ten indicators of the Index are scaled equally. Each of them gets 0 to 100 economic freedom grading scale; countries that get 100 are the freest economies of the world. The Index has been published by The Heritage Foundation and The Wall Street Journal since 1994 [7].

E. The Human Development Index

The Human Development Index is a summary indicator that measures a standard of living, the literacy rate, the life

expectancy in order to compare and assess the human potential of different countries [8].

F. The Democracy Index

The Democracy Index, compiled by the Economist Intelligence Unit, is the classification of 167 countries by the level of the democracy. The Index includes 60 indicators grouped in five categories: electoral process and pluralism, civil liberties, functioning of government, political participation, and political culture [9].

G. KOF Index of Globalization

KOF Index of Globalization compiled by the Economist Intelligence Unit. The KOF Index of Globalization measures the three main dimensions of globalization: economic, social and political. In addition to three indices measuring these dimensions, we calculate an overall index of globalization and sub-indices referring to actual economic flows:

- economic restrictions
- data on information flows
- data on personal contact
- and data on cultural proximity.
- Data are available on a yearly basis for 207 countries over the period 1970 – 2010 [10].

For all represented above indexes we can say, that they are considered to be particular assessment of social-economic development. Besides they often include such indicators, that are not assessed by statistic services and therefore they can only be estimated by experimental method, which is obviously limit wide usage opportunity of these indexes. One of the most important problems is to assess the weight of each component.

III. New Methodological Approach

Using above-mentioned indexes, we represent an integral index, that assess social-economic development level for 2009-2013 based on statistic data for seven indexes (KOF Index of Globalization, The Corruption Perception, The Global Competitiveness Index, Doing Business, The Index of Economic Freedom, The Human Development, The Democracy Index). As a result we have the integral assessment of social-economic development for chosen countries.

To create the Integral Index of Reforms we calculated the ratio of observed seven indexes. Those ratios were acquired experimentally by 56 both Armenian and foreign experts who are state and non-governmental management workers, as well as economists. In the result of the assessment of the seven indices normalized coefficients were provided and the total sum of their ratios is 1.

Those coefficients are:

α_i^j - the scale of each index,

i and *j* are indexes

i=1, 2,...7 - the seven indexes,

j_1=1, 2,....15 –developed countries, j_2=1, 2,....24 countries in transition, j_3=1, 2,....10 least developed countries we evaluated. For example,

α_4^j =0,12 - the scale of The Economic Freedom Index in the Integral Index of Reforms for j_2=1, 2,....24 countries in transition,

α_4^j =0,13 - the scale of The Economic Freedom Index for j_1=1, 2,....15 countries, and

α_4^j =0,16 - the scale of The Economic Freedom Index in the Integral Index of Reforms for j_3=1, 2,....10 countries:

$$\sum_{i=1}^{7} \alpha_i^j = 1,$$

With the help of our methodology we first summarized the above-mentioned 7 indexes and attained 1 general index.

$$H_{\text{int}.index}^j = \sum_{i=1}^{7} \alpha_i^j N_i^j,$$

$H_{\text{int}.index}^j$ - the Integral Index of Reforms ,

i and *j* are indexes

i = 1,2,….7 – the seven indexes. For example, *i* = 4 The Economic Freedom Index,

j_2=1, 2,....24 countries in transition we evaluated

j=1 - Albania, *j*=2 – Armenia, … *j*=21 - Vietnam

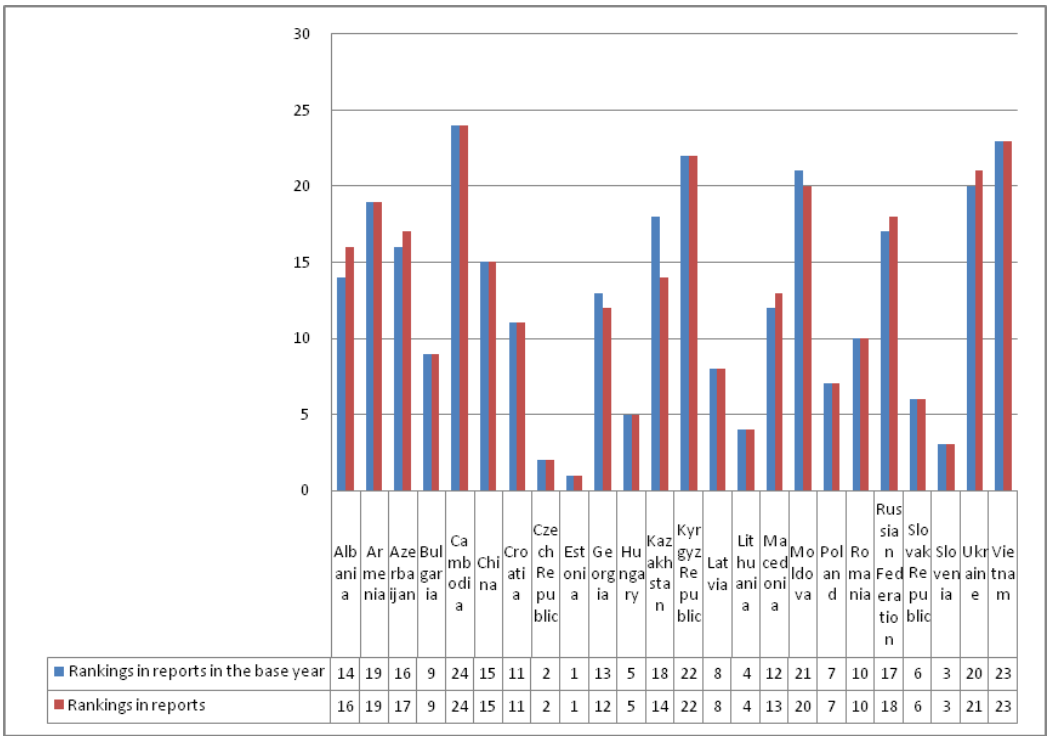
α_i^j - the scale of each index,

N_i^j - the rank of the *j* country by *i* index

For example, Armenia is ranked 4 among 24 countries for 2010-2013 by the Global competitiveness index (considering the change of rank and score), therefore $N_1^2 = 4$

The first stage of creating the index was the rearrangement of the indexes included in analyze. The principle of rearrangement was based on the changes of the ranks and average of scores of the above mentioned indexes for two periods of time. Then we adjusted the change with scale coefficients substantiated methodologically. Depending on the level of the social-economic development of the country and the comparative efficiency of various reforms we used scale coefficients. For example, for those countries which had more than 7 points of improvements in rank we gave 0,1 for the change of the rank and 0,9 for the average score, for those who had more than 7 points of decrease in rank we gave 0,9 for the change of the rank and 0,1 for the average score [11].

Fig. 1, 2, 3 represent the Integral Index of Reforms in reports for 2009-2013 compare with the base year (2009) in both 24 countries in transition, 15 developed and 10 least developed countries. Fig. 4, 5, 6 represent the Integral Index of Reforms by the new methodology for 2009-2013 compare with the base year (2009). Fig. 7, 8, 9 represent the Integral Index of Reforms in reports and by the new methodology in 24 countries in transition, 15 developed and 10 least developed countries for 2009-2013.



	Albania	Armenia	Azerbajan	Bulgaria	Cambodia	China	Croatia	Czech Republic	Estonia	Georgia	Hungary	Kazakhstan	Kyrgyz Republic	Latvia	Lithuania	Macedonia	Moldova	Poland	Romania	Russian Federation	Slovak Republic	Slovenia	Ukraine	Vietnam
Rankings in reports in the base year	14	19	16	9	24	15	11	2	1	13	5	18	22	8	4	12	21	7	10	17	6	3	20	23
Rankings in reports	16	19	17	9	24	15	11	2	1	12	5	14	22	8	4	13	20	7	10	18	6	3	21	23

Fig. 1. The Integral Index of Reforms in reports for 2009-2013compared with the base year (2009) in 24 countries in transition

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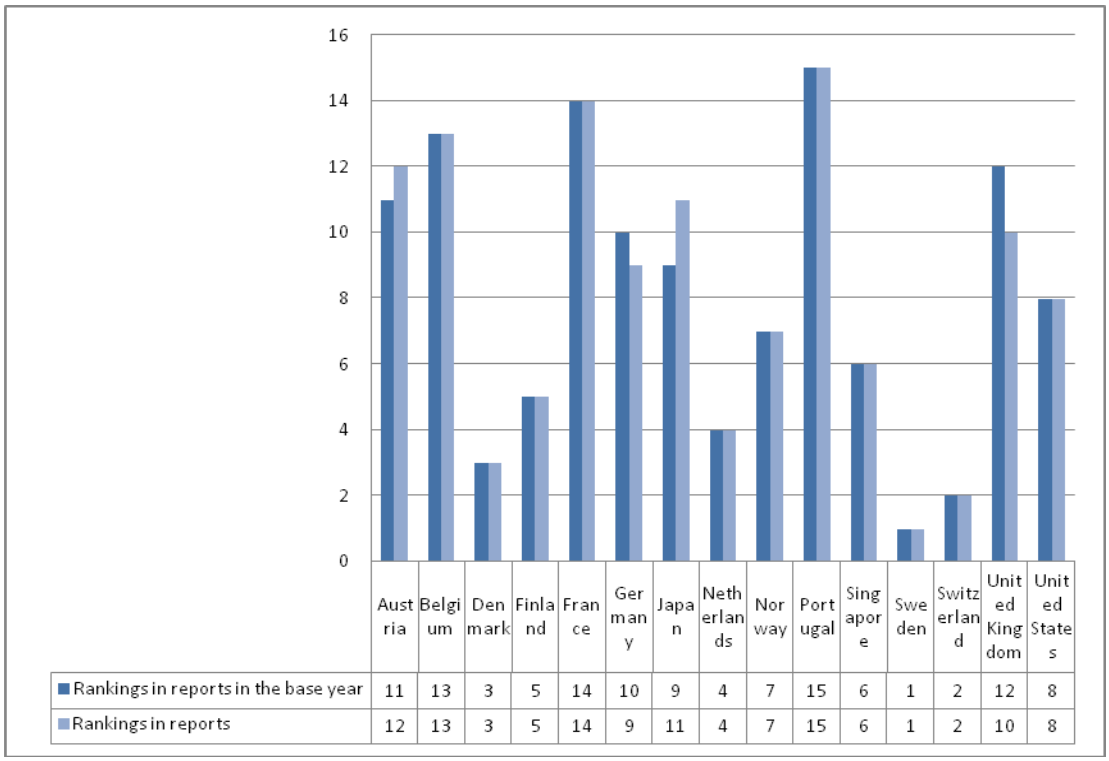
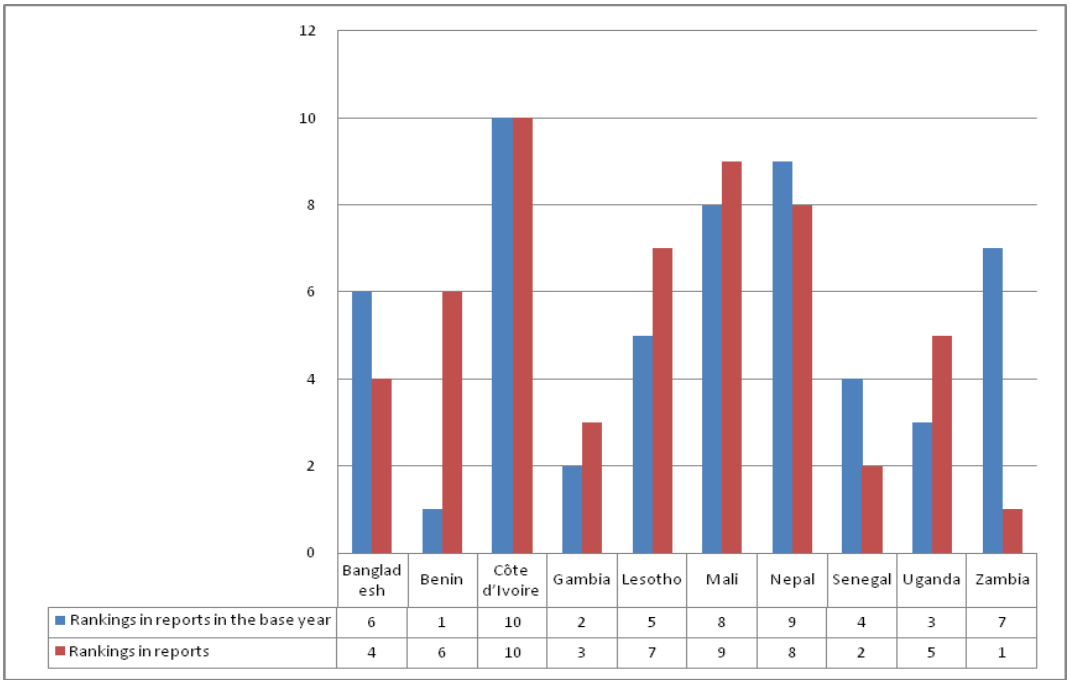


	Austria	Belgium	Denmark	Finland	France	Germany	Japan	Netherlands	Norway	Portugal	Singapore	Sweden	Switzerland	United Kingdom	United States
Rankings in reports in the base year	11	13	3	5	14	10	9	4	7	15	6	1	2	12	8
Rankings in reports	12	13	3	5	14	9	11	4	7	15	6	1	2	10	8

Fig. 2. The Integral Index of Reforms in reports for 2009-2013 compared with the base year (2009) in 15 developed countries



	Bangladesh	Benin	Côte d'Ivoire	Gambia	Lesotho	Mali	Nepal	Senegal	Uganda	Zambia
Rankings in reports in the base year	6	1	10	2	5	8	9	4	3	7
Rankings in reports	4	6	10	3	7	9	8	2	5	1

Fig. 3. The Integral Index of Reforms in reports for 2009-2013 compared with the base year (2009) in 10 least developed countries

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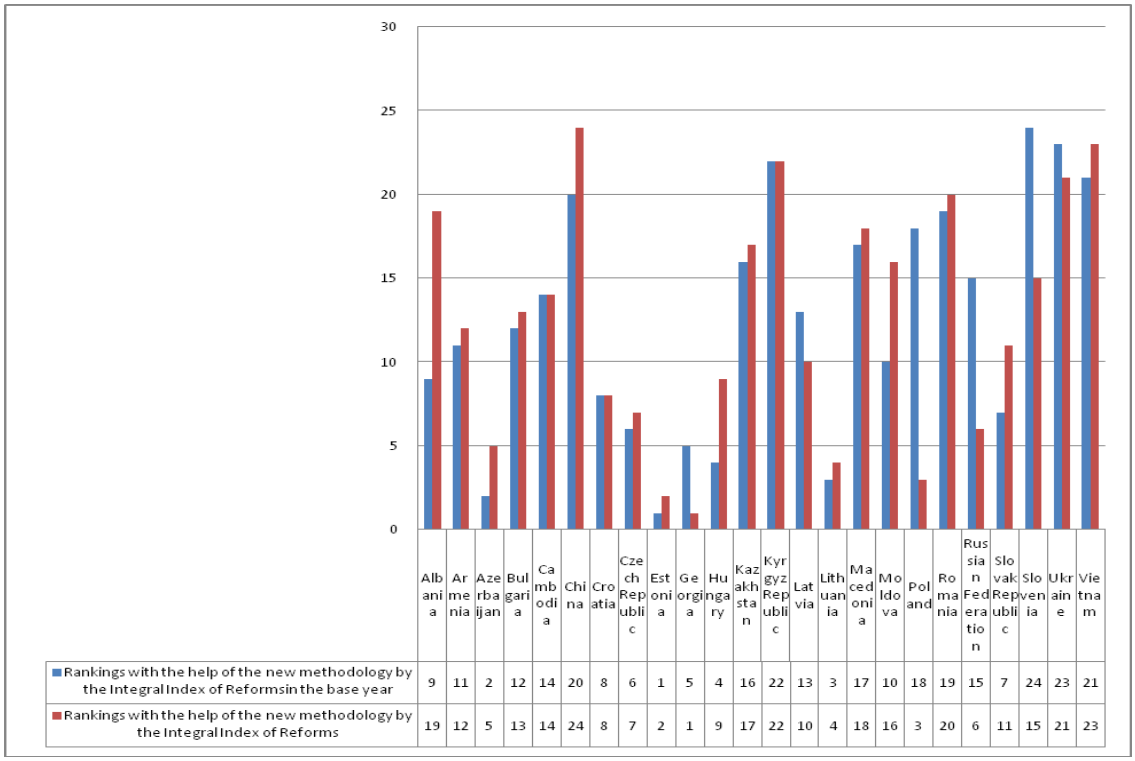
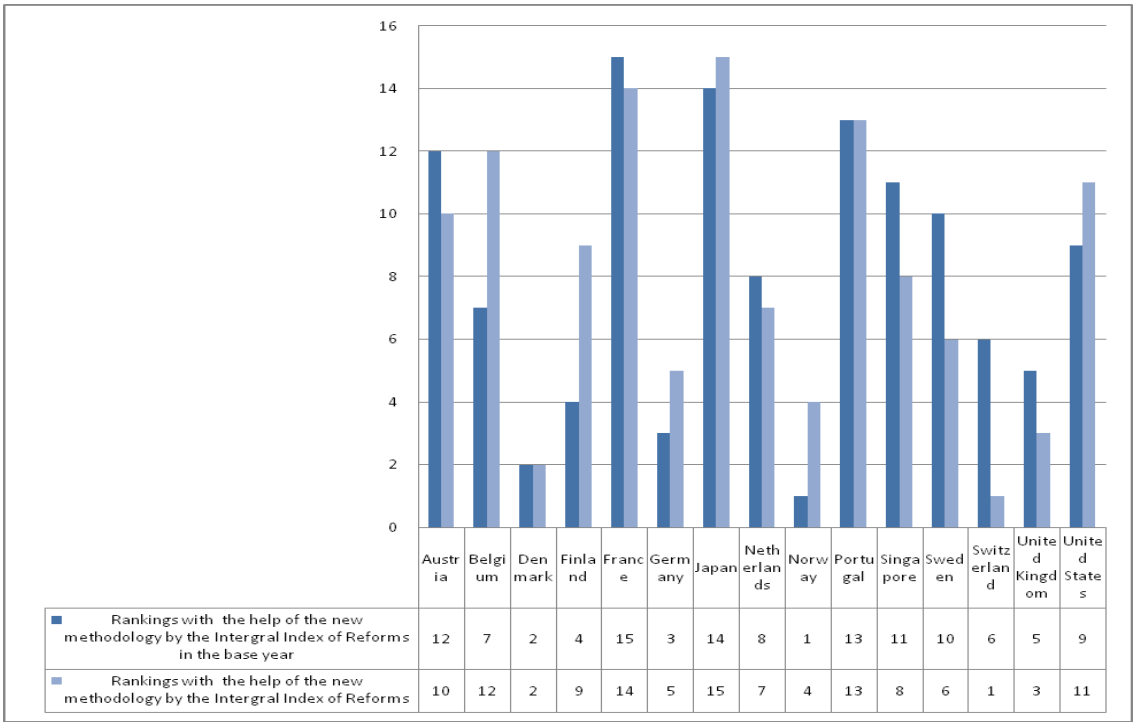


	Albania	Armenia	Azerbaijan	Bulgaria	Cambodia	China	Croatia	Czech Republic	Estonia	Georgia	Hungary	Kazakhstan	Kyrgyz Republic	Latvia	Lithuania	Macedonia	Moldova	Poland	Romania	Russian Federation	Slovak Republic	Slovenia	Ukraine	Vietnam
Rankings with the help of the new methodology by the Integral Index of Reformsin the base year	9	11	2	12	14	20	8	6	1	5	4	16	22	13	3	17	10	18	19	15	7	24	23	21
Rankings with the help of the new methodology by the Integral Index of Reforms	19	12	5	13	14	24	8	7	2	1	9	17	22	10	4	18	16	3	20	6	11	15	21	23

Fig. 4. The Integral Index of Reforms by the new methodology for 2009-2013 compared with the base year 2009 in 24 countries in transition



	Austria	Belgium	Denmark	Finland	France	Germany	Japan	Netherlands	Norway	Portugal	Singapore	Sweden	Switzerland	United Kingdom	United States
Rankings with the help of the new methodology by the Intergral Index of Reforms in the base year	12	7	2	4	15	3	14	8	1	13	11	10	6	5	9
Rankings with the help of the new methodology by the Intergral Index of Reforms	10	12	2	9	14	5	15	7	4	13	8	6	1	3	11

Fig. 5. The Integral Index of Reforms by the new methodology for 2009-2013 compared with the base year 2009 in 15 developed countries

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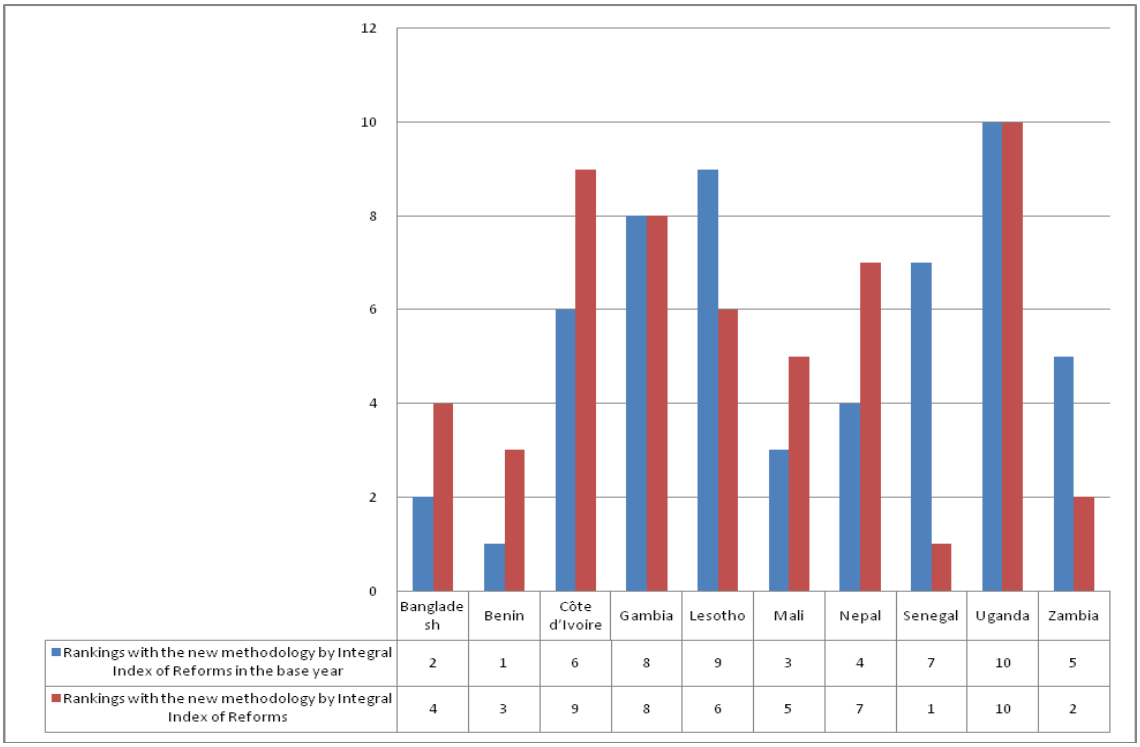

	Banglade sh	Benin	Côte d'Ivoire	Gambia	Lesotho	Mali	Nepal	Senegal	Uganda	Zambia
Rankings with the new methodology by Integral Index of Reforms in the base year	2	1	6	8	9	3	4	7	10	5
Rankings with the new methodology by Integral Index of Reforms	4	3	9	8	6	5	7	1	10	2

Fig. 6. The Integral Index of Reforms by the new methodology for 2009-2013 compared with the base year 2009 in 10 least developed countries

At the second stage countries were rearranged by the methodology mentioned above. This approach was repeated for each year combining with the previous year. As a result of the first and second stages we had a new range of countries for each index for 2009-2013.

At the third stage we gave scale coefficients to all seven indexes considering the importance and the variety of included indicators, eliminating the usage of the same indicator and finally we had Integral Index of Reforms of each country for 2009-2013.

Putting the indicators of α_i^j and N_i^j in the equation we will have H_i^j .

$H_{\text{int}.index}^j = \sum_{i=1}^{7} \alpha_i^j N_i^j$, For j_1=1, 2,....15 –developed countries, j_2=1, 2,....24 countries in transition and j_3=1, 2,....10 –least developed countries we assess the average of the summary for 4 years.

$$(H_{i_1}^j + H_{i_2}^j + H_{i_3}^j + H_{i_4}^j)/4$$

For instance, The Economic Freedom Index for Arnenia will be:

$$(H_{4_1}^2 + H_{4_2}^2 + H_{4_3}^2 + H_{4_4}^2)/4$$

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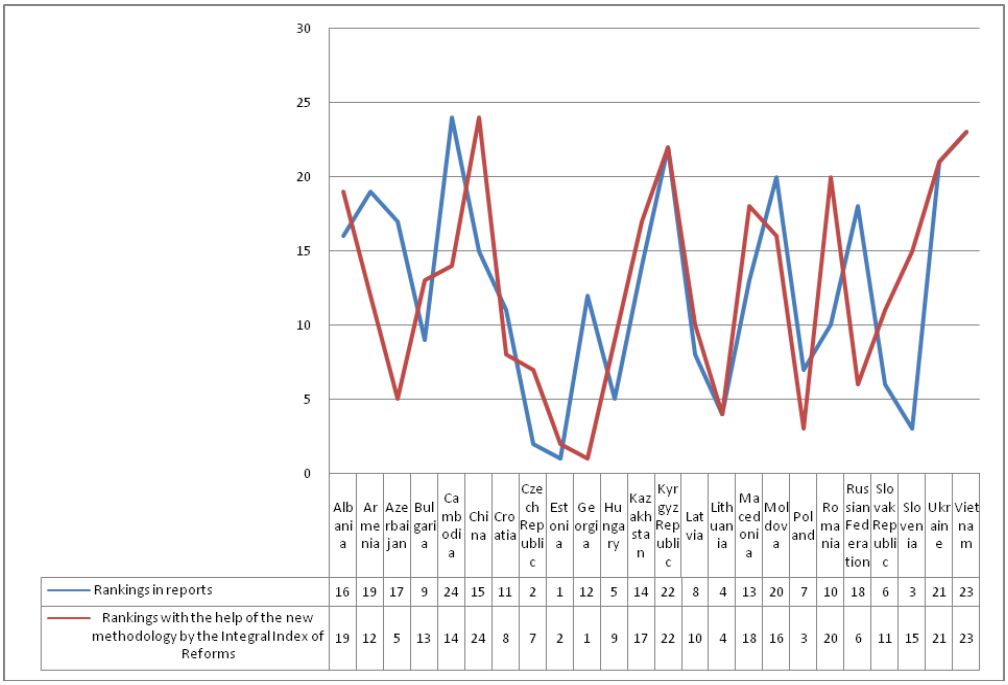
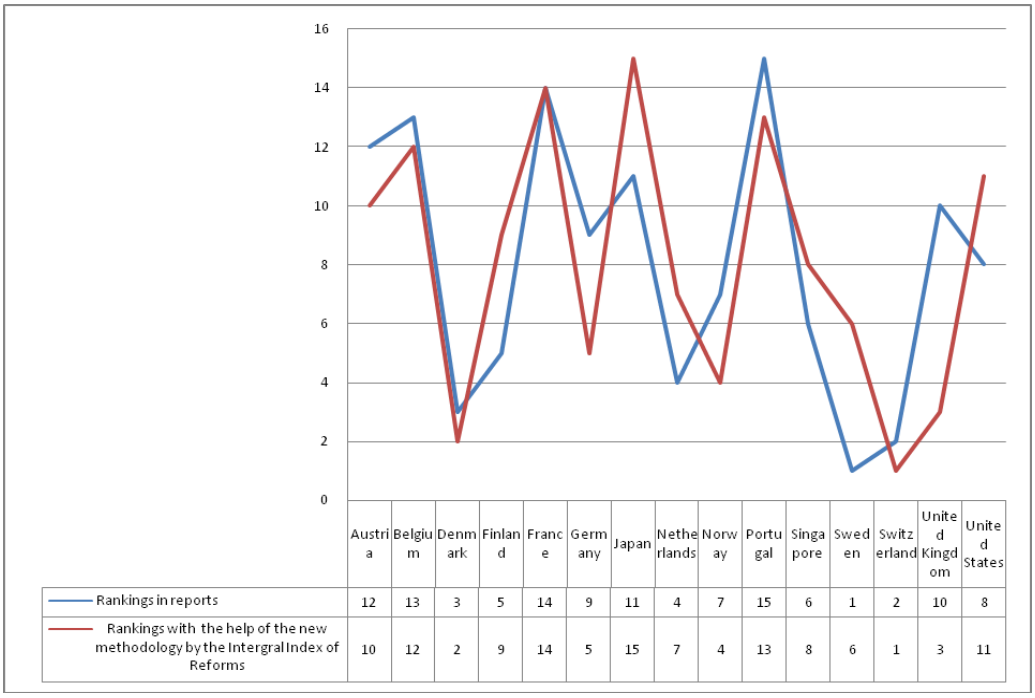


	Albania	Armenia	Azerbaijan	Bulgaria	Cambodia	China	Croatia	Czech Republic	Estonia	Georgia	Hungary	Kazakhstan	Kyrgyz Republic	Latvia	Lithuania	Macedonia	Moldova	Poland	Romania	Russian Federation	Slovak Republic	Slovenia	Ukraine	Vietnam
Rankings in reports	16	19	17	9	24	15	11	2	1	12	5	14	22	8	4	13	20	7	10	18	6	3	21	23
Rankings with the help of the new methodology by the Integral Index of Reforms	19	12	5	13	14	24	8	7	2	1	9	17	22	10	4	18	16	3	20	6	11	15	21	23

Fig. 7 The Integral Index of Reforms in reports and by the new methodology for 2009-2013 in 24 countries in transition



	Austria	Belgium	Denmark	Finland	France	Germany	Japan	Netherlands	Norway	Portugal	Singapore	Sweden	Switzerland	United Kingdom	United States
Rankings in reports	12	13	3	5	14	9	11	4	7	15	6	1	2	10	8
Rankings with the help of the new methodology by the Intergral Index of Reforms	10	12	2	9	14	5	15	7	4	13	8	6	1	3	11

Fig. 8. The Integral Index of Reforms in reports and by the new methodology in 15 developed countries for 2009-2013

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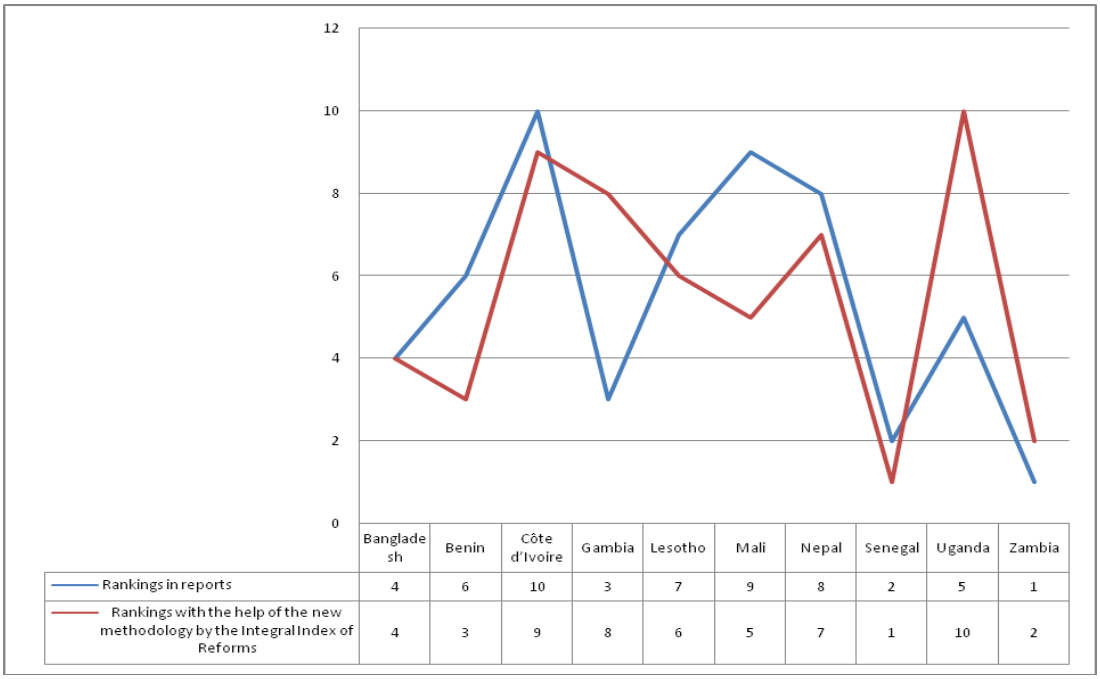

	Bangladesh	Benin	Côte d'Ivoire	Gambia	Lesotho	Mali	Nepal	Senegal	Uganda	Zambia
Rankings in reports	4	6	10	3	7	9	8	2	5	1
Rankings with the help of the new methodology by the Integral Index of Reforms	4	3	9	8	6	5	7	1	10	2

Fig. 9. The Integral Index of Reforms in reports and by the new methodology in 10 least developed countries for 2009-2013

According to the suggested methodology, we measure Integral Index of Reforms for 15 developed, 24 countries in transition and 10 least developed countries, considering the change of rank and score adjusted with scale coefficients for 2009-2013. The results witness, that the reforms for 2009-2013 have more effectively implemented in Georgia, Russia Poland, Azerbaijan, Moldova, Croatia and Armenia, but less effectively in Romania and Vietnam.

In our opinion the Integral Index of Reforms can express comparative efficiency of various reforms in each country more integrally than each of the indexes not only the ones we have included in the article, but also some indexes which are not represented in the article such as Transformation Index BTI and The index of Sustainable Economic Welfare.

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Game Theory as a Tool for Crisis Management and the Creation of National Security Policies

A. Jan Fuka, B. Ilona Obrsalova, C. Lucie Jelinkova

***Abstract* —** Issue of terrorism and national security policies, regions or private companies are becoming still more important part of security strategies making and crisis management worldwide. Czech Republic is region that would not be threatened by international terrorism, but Czech extremism and terrorism is considered as significant security threat. Problem of extremist and terrorist activities is increasingly studied using Game Theory, which seems to be proper instrument of crisis management in case when it is not possible to examine various conflict participants, without consideration of their reaction and interaction. This work deals with the Czech extremist and terrorist scene and possible solution for private and mainly public sector based on available information obtained by analyzing domestic extremism and terrorism, and description of Czech public administration and public sector.

***Keywords* —** Game Theory, management, national security, risk, terrorism

I. INTRODUCTION

Czech security strategy defines terrorism as one of the foremost security threats. [8] Most definitions of terrorism coincide in saying that this phenomenon is described as an act of violence used to reach aims by intimidation and fear. Terrorism seems to influence the public opinion equally as the academic world, while the image of an irrationally thinking and acting terrorist has been shifting towards a more thorough research of the conflict reasons and motivation of terrorist acts and their modelling. *"Game Theory plays more important role in the defence economy study. It also plays a role in the study of conflict, negotiation, keeping peace, competition, armament and weapons trade."* [1] Game Theory (GT) is a comprehensive scientific discipline that deals with conflict situations contingent upon predetermined input parameters and it is applied in private and also public sector as a decision-making tool. "*In decision-making phase there are a number of alternatives; this problem includes economic and technical viewpoints.*" [10] Therefore, there are many games in which determining the appropriate game is an essential foundation for achieving a successful outcome. Another necessary step is determining which players should be part of the game and the subsequent definition of their rationalities. For the purposes of this study, the first player shall be the terrorist (terrorist group), and the second player shall be the Czech Republic. The article deals with the possibilities of creation and use of security scenarios for select crisis events caused by a terrorist attack, and the application of GT as a supportive tool for crisis decision making. Together with scenarios there is also introduced a proposal for a State Security Advisory System, and defines four security levels, and the related guidelines.

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II. GAME THEORY AND TERRORISM

GT seems to be suitable tool to study and fight against terrorism, because it reflects interaction between attacked subject and a terrorist, while individual steps are mutually depending. At least one party (player in GT terminology) acts in a way to maximize their profit. In this context, attacked subjects and terrorists act with the aim to gain a strategic advantage. Several more reasons to use GT:

a) GT describes terrorist and government actions as mutually dependent
b) Governments and terrorists are rational actors who react to counterparty´s actions
c) Governments and terrorists act in a way to gain a strategic advantage
d) Governments and terrorists act to maximize their profit (aircraft hijacking - see above)
e) Governments and terrorists make decisions in the situation of incomplete information [3]

A. Basic Aspects of Game Theory

GT is dealing with decision making in conflict situations. Conflict situation may occur in numerous cases. *"The notion of a game in modern Game Theory has a very general meaning that involves both the drawing-room games such as chess or poker, but in principle, any conflicting situation among individuals, enterprises, armies, states, political parties and species"*. [4] For analysis of individual situations, GT uses mainly mathematical structures, psychology, sociology or economy. Game objective is a strategy based on the analysis of an aggregate of decision-making unit. *"The one who takes an attempt in strategic behaviour should be clear about several aspects, the first one being the objective to*

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approach." [5] The objective is to choose an optimized strategy at respecting assumed strategy or steps to be taken by other player or players. Specific situation is in question, where individual players mutually react, change strategies and create countermeasures. Player or participant can be an individual, a pair or a group. Decision-making of individual players are done based on different strategies.

Basic prerequisites for a GT application are the following:

a) At least one player is rational
b) All the players know the rules which are unchanged during one game
c) Players are familiar with the values in the game and know the loss and profit amounts [7]

One of the essential terms in a GT is a general model – game in a standard form that is understood as a triplet of aggregates.

$((1,2,..,n),(S_1,..,S_n),(Z_1,..,Z_n))$
$(1,2,..,n)$ – sum of players
$(S_1,..,S_n)$ – sum of strategies
$(Z_1,..,Z_n)$ - sum of players payoff functions

Players are numbered with natural numbers. Important condition of this model is to differentiate individual players and to know their number, which is at least two. Each i^{th} player has its strategy - S_i. Strategies can be understood as a description of a player´s procedure through the game, or its sequence of steps selected during the game. If it is standard game, then players choose strategy $xi \in S_i$. All strategies selected by all players in one game then determine the value of payoff function Z_i $(x_1,..,x_n)$ for an i^{th} player. Individual games can be differed by number of players, rationality of players, strategies, cooperation and the fact if player is intelligent or non-intelligent. An intelligent player is a rationally thinking subject who understands strategies and has a defined objective. A non-intelligent player is often so called nature, which results from the use of the GT in the events influenced by the dependence on natural phenomena, such as weather, earthquake, etc.

B. Examples of Game Theory Use in Case of Anti – terrorist Strategies

GT is being used to make anti-terrorist policies and security strategies. Sandler and Arce [3] modelled situation where government faces the decision whether and when they should accept terrorist requirements. Authors complement this strategy by conditions stemming from the GT application. The first one reflects the attitude of the government that is required to be persistent at any circumstances. The second condition is incomplete information on the terrorist side about the governmental anti-terrorist measures. Another example of the GT utilization is "competition" in security measures in different countries. Sander and Arce use the GT [3] call it "intimidation race".

Typical example and probably the most discussed example of the GT use in safety science is the so called prisoner´s dilemma. Players are introduced to a situation where a crime has been committed and two suspects, A and B, have been arrested. Evidence is incomplete and it is very difficult to proof the guilt to any of suspects. Both the suspects are investigated separately (A does not know about the B´s decisions and vice versa) and both are given the following option:

a) If one of the suspects confesses to the crime while the other does not, then the one who confessed will be sentenced for one year, while the other for ten years.
b) If both confess, the sentence will be 7 years.
c) If none of them confesses, then the imprisonment shall be three years

		A: confession	A: non - confession
B	confession	7,7	1,10
B	non - confession	10,1	3,3

Figure 1 Prisoner´s dilemma [author]

The decision making will be firstly analyzed from of the A´s point of view. Prisoner A does not know about the B´s reaction, trying to reach a maximum advantage for himself. The matrix shows that if B confesses, A will also benefit from the confession. In such case the sentence is seven years. Providing he refuses to confess to the crime, the sentence is ten years. If prisoner B refuse to confess, it is advantage for A to confess because the sentence shall be one year only; compared to the three years in the case of a refusal. Prisoner B will make the same decisions. The result will be confession on both sides and a sentence of seven years´ imprisonment for each.

If neither confesses, they will be sentenced for three years. Therefore confession presents a dominant strategy. The dominant strategy closely relates to the Nash Equilibrium: *"If each player follows the most suitable strategy for himself, i.e. a dominant strategy, then a deflection from such strategy, while the other player (players) sticks to the dominant strategy, will mean an adverse situation for the first player."* [6]

Prisoner´s dilemma is a situation where individual players in the game (countries, companies, individuals) follow their dominant strategy, which in reality leads to a resultant disadvantage. Prisoner´s dilemma can be used in decision-making processes in performing contracts about armament or company restraint trade agreements. Sandler and Arce [3] apply prisoner´s dilemma on a situation when governments choose between active and reactive anti-terrorist policies. Active policy focuses on an open and active fight against terrorism, consisting of:

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a) Search for and liquidation of terrorists,
b) Destruction of resources and terrorist infrastructure,
c) Active monitoring of terrorist activities,
d) Prevention from terrorists and their sponsors.

If the active anti-terrorist policy of one country is successful and a terrorist unit is liquidated, then other states tend to rely on active measures of other states. In such case the "black passenger" effect occurs and the risk and cost relating to an active fight against terrorism are borne by one state, while the other only profit from the prospective benefits. Reactive policy is typical mainly in the solution of terrorist attack consequences. The black passenger effect is demonstrated by means of the prisoner´s dilemma in the following matrix:

		EU	
		active	non - active
USA	active	2,2	-2,4
	non - active	4,-2	0,0

Figure 2 Application of prisoner´s dilemma[author]

There are two players: the USA and the EU. Both the states together face a potential threat of a terrorist attack and they are obligated to agree upon applying an active anti-terrorist policy. A necessary prerequisite is an active policy benefit amounting at 4 and costs of 6 for the country that pursues the active policy.

If the USA are to apply active policy and the EU is the state that only makes use of the relating benefits (the black passenger), then the EU gains the profit of 4. USA gain -2 (4-6). The costs amounting at 6 will be deducted from the gained profit 4. In the opposite event, if the black passenger is the USA, the profit will be the opposite. If both the countries apply active policy, then each of them gains an advantage of 2 (6 – 2 x 4). The result is a prisoner´s dilemma – type - game in which none of the countries intends to apply active anti-terrorist policy.

III. CZECH REPUBLIC AND TERRORISM

Previous chapters have suggested that, for the game to be relevant, its basic parameters must be established. For the purpose of this article, the game will include two players. The first is Czech terrorist, and the second player is Czech Republic. The rationality of the first player will be discussed in detail, as the fundamental preliminary requirement. In the case of the Czech Republic, respectively its security measures, its rationality need not be proven. In the chapter dealing with the second player, the Czech Republic will be described from an institutional standpoint, with an emphasis on public security forces.

A. Czech Terrorist as the First Player

Years 2009 - 2012 were in the Czech republic as well as previous years, characterized by the growth of extreme right - wing and extreme left - wing activities, which may be caused by, among others, economic recession and public dissatisfaction with some of the current Czech government actions. Increases were identified in both violent crime and public gatherings and demonstrations. This trend is also evident in the development of crime that is since 2006 more or less constant. The proportion of violent crimes with an extremist subtext, however, increased and also increased the number of public events organized by extremists. *"On one hand, the situation is evident in terms of crime, which is although quantitatively at approximately the same level of quality but it is increasing violent crime with an extremist subtext. Another phenomenon is the effect of local extremist cells, producing their own activities and forms of activism, to some extent, operating with a high level conspiracy and susceptible to radicalization, or aspiring to attempts at direct action".* [2]

In 2011, there were organized 334 public events, 123 organized by right-wing extremists, 211 by left - wing extremists. In 2010 it was organized 200 public events. From above it follows that Czech extremists outside the offending move their activities towards a critique of state development and focus on topics that may reach the public. These include corruption in public administration, the functioning of political leaders at all levels and the problems of socially excluded localities. Also continues increasing trend of in using information technology, especially the Internet. Increasingly, all the common tools are used that provides a cyberspace - creation of websites, forums and social networking. While the low ability of right-wing nationalist scene to work organized causes attenuation of its activity, the successor to today canceled Worker´s party - Workers' Party of Social Justice (WPSJ) became the most prominent representative of the current right - wing groups in the Czech Republic. This party has ambitions to work in the Czech political system, and use its program to populist issues (unemployment, criticism of the European Union, migration, anti - Roma attitude) is trying to get sympathizers. The party operate mainly in economically weak regions where organized (and still organize) demonstrations and public gatherings designed to attract new supporters in regional elections in 2012 and efforts to publicize.

Active extreme left presented mainly anarchists reacted critically to the development of the economic situation in the European Union and the Czech Republic, and a significant part involved in the fight against the extreme right - wing. Marxist-Leninist communist and neo-Bolshevik part of the scene in 2011 - 2012 did not show any significant activity. Both the Communist factions focused on criticism of the Czech government and marginally on the issue of right-wing extremism.

According to Reports on Extremism and Racism and Xenophobia in the Czech Republic in 2011 [2] as these points appear to be basic on the left-wing extremism:

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a) The scene is still fragmented on different ideological currents and directions.
b) The rate of informal links with foreign left - wing parties increases, which is especially evident within the anarchist spectrum, including militant organizations.
c) Criminal activity is generally quite specific, its detection is problematic.
d) Extreme left - wing scene obvious attempts to import platforms civic activism inspired by foreign entities. In particular, the activities of the “15M/True Democracy Now or Occupation” movement, or citizens' initiative within the anti-fascist movement.

Partial conclusions resulting from the analysis of Czech terrorist scene are:

a) Extremist parties in The Czech Republic operate across the political spectrum (extreme right – wing, extreme left - wing).
a) Extremist and terrorist scene in the Czech Republic is characterized by extreme right - wing, whose "serious" part tends to operate within official policy and to gain support also uses some of the tools of political marketing.
b) Open right-wing groups and the extreme left are taking more direct, often use violent actions.

The aim of analyzing Czech extremist and terrorist scene was to confirm or refuse if Czech terrorists could be considered as a rationally thinking, whether it is possible to clearly identify or at least majority - term terrorist in Czech conditions, so that it could be then considered as one of two players in the proposed model to be applied to decision - making situations. Authors, who use GT in the case of international terrorism, working primarily with the concept of religious terrorism, when can be particularly said that:

a) Terrorist attacks are carefully planned.
b) Terrorists respond to changes in government anti - terrorism policies.
c) Terrorist organizations have specific structure.
d) In most cases it is clearly identifiable groups which can be unambiguously described.
e) Terrorists apply violent methods in achieving their goals.

Czech extremist and terrorist scene in the above – mentioned points are not similar to international one. Czech terrorists, namely those who are willing and are able to use violent action, do not plan, violent acts often have the character of spontaneous strikes, which have so far only in few cases character of attack on industrial object (eco - terrorists attacks on the company Biotest). Groups that can be seen in the Czech Republic as terrorist, show only a limited rate of organization. Structure and organization can be identified with extremist parties that operate in the Czech political scene, such as WPSJ. These parties will, due to their position, provide terrorist methods with very small probability. Another sticking point is inhomogeneous structure of the Czech terrorism, which basically makes it impossible to identify and work with the term "terrorist" or "terrorist group" as with general term, which would allow its use in this thesis. Based on these conclusions it be said that Czech terrorist cannot be considered as rational player.

Terrorist or terrorist group is the first player (P1), who triggers critical event. Possible sets of such events that may occur after the terrorist attacks, let be the strategy of the first player. If S1 is marked as a set of strategies of the first player, then:

Def. 1

P1 ... terrorist - irrational player
$S1 = (t_1,t_2,t_3 \ldots t_N)$ where N is natural number
t... strategy of the first player

B. Czech Republic as the Second Player

Following 1989, the private and public sectors--as well as the Czechoslovakian public administration--underwent a significant transformation, just like most of the other countries in the so-called Eastern Bloc. The fall of communism enabled the organisation and implementation of multi-party parliamentary elections, but, at the same time, it was essential to establish the polities of the emerging Czech and Slovak states. The Czech and Slovak Federal Republic (ČSFR) was approved as an official title in April of 1990, whereas the growing pressure from Slovakia for increasing autonomy (equal sovereignty of both states, internationally recognised legal entities, two central banks), and the unacceptability of these requests for Czechia, lead to the dissolution of the federation in 1992, enabling the formation of the Czech Republic. *"The proposal was unacceptable for the Czech side, which accepted only two alternatives - a functional federation, or two independent states."* [9] The Czech R mepublic was founded on 1. January 1993, and, for the sake of continuity, it adopted the majority of the laws established for the former ČSFR, effective as of the date of the dissolution of the federation. The Czech Republic also adopted all of the commitments and laws effective at the time of the dissolution of the federation, and the new borders of the Czech Republic were determined according to historical foundations. The constitution of the Czech Republic from the year 1992 included the definition of the structure of the public sector, the fundamental rights and liberty of its citizens, and divided power into legislative, executive, and judicial branches. The legislative branch of the Czech Republic is represented by a bicameral parliament. The House of Parliament includes 200 members that are elected for a period of four years, and the Senate has 81 senators elected for six years. The executive branch of the Czech Republic is represented by the president, government, and the state's attorney's office. The judicial branch is represented by the court system.

The current public administration of the Czech Republic can be divided into the national administration and administration. The national administration is represented primarily by the central state administration (government, ministries), regional state administration (employment offices, financial offices),

and by self-regulated authorities that take on some of the functions of the state administration (provincial and municipal authorities). In terms of self-regulated authorities, the Czech Republic is divided into 14 regions and 6,253 municipalities. Self-regulated organisations also include special interest and professional chambers, as well as universities.

The central state administration of the Czech Republic is represented primarily by the ministries and other central authorities. The scope of the state administration (just as that of the self - regulated authorities) is rooted in the Constitution of the Czech Republic, which defines the particular roles and responsibilities of the government, and outlines the management of the ministries, the legal regulation of employee relations, and the powers of the individual offices. The government of the Czech Republic and the individual ministries are an executive body headed by the Prime Minister, vice-chairmen, and ministers. The government is appointed by the president of the republic, issues regulations, and addresses the issues of internal and international policies. Following 1989, the public administration underwent a number of reforms, fundamental for the central establishment being the dissolution of district offices and the resulting deconcentration and dissolution of the public administration. The first phase (in 2000) included the establishment of regional self-regulated authorities, and the associated preparation of relevant laws (municipalities, regions, finance, property), and the organisation of regional elections for fourteen regional offices. In the second phase, the district offices were dissolved, an expansion of the decentralisation and deconcentration was affected, and on 1. January 2003, the functions of the dissolved district offices was transferred to local self-regulated authorities, i.e. municipalities and regions.

From a legislative standpoint, the municipal self-regulated authority of the Czech Republic is subject to laws on municipalities, regions, and the capital city of Prague. Municipality is defined as a basic, autonomous territory and public corporation, that maintains property and has its own rights and responsibilities. Municipalities act in an independent (issuing binding regulations, security sector, culture, public policy, municipal economy, cooperation between municipalities, imposing sanctions) and delegated (receive contributions from the national budget, is governed by laws and regulations) scope of power, and are regulated by the respective ministries. The basic municipal authorities include the local authority, council, and the municipal office, all of which have their own specifications according to the type of municipality.

The 1993 regional order, which was followed by a municipal order, was renewed in the year 2000. A regional authority was established in each of the 14 regions, which absorbed not only the duties of the state administration, but also the duties of the regional autonomous authority. As a part of the transition to regional orders, new laws on municipalities, regions, local elections, finances, and other standards associated with the restoration of the regions needed to be proposed. Regions in the Czech Republic have varying numbers of residents (Karlovy Vary region: 304,600; Moravian-Silesian: 1,250,000), area (Liberec region: 3,163 km2; Central Bohemian region: 11,015 km2) and varying economic strength. According to the Act on Regions, the region publicly manages an autonomous community of citizens, that acts in an independent capacity(issuing decrees, registering complaints regarding regulations that overreach into independent activities, creating budgets, strategic regional development, training and schools, education, cultural development, transport services, legislative initiatives, endowment policies) and a delegated capacity for which the region receives contributions from the state budget (administrative proceedings, issuing regional ordinances, managing crisis situations and states of emergency).

The main authorities of the regional self-regulating authority include the Regional Assembly that is elected by secret ballot of a proportional electoral system for four years. The Regional Council is an executive body of the region that operates primarily in an independent capacity. The council is headed by the Deputy Governor. For regions with populations of less than 600,000 the council includes 9 council members, while other regions have 11. The official representative of the region is the governor that is elected by the council, stands at its helm, and signs legal documents or organises solutions for crisis situations. The Regional Office is the regional authority that acts in independent and delegated power capacity, oversees the decisions of municipal offices, and imposes sanctions.

C. Security in the Czech Republic

Part of the security profile of the Czech Republic stems from the fact that it is a member of the European Union and NATO. The foundation of security policies in the Czech Republic lies in the Security Strategies of the Czech Republic which define the recourse of security policies, security interests of the Czech Republic, security environment, strategies for asserting the Czech Republic's security interests and system of security. The Czech security policies are a set of measures and steps aimed at the elimination of threats and their resulting risks, whose primary goal is securing internal and external security and protecting the state and its citizens. The commander of the Czech armed forces is the president of the Czech Republic. Laws, orientation of security policies, international interventions, or states of war are all proposed and approved by the Czech Parliament. The government, and the Ministry of the Interior of the Czech Republic in particular, implements security policies, issues and implements the Security Strategies of the Czech Republic, and deals with crime prevention and the management of crisis situations. A significant authority specialising primarily in the scope of interior and exterior security is the National Security Council, which collaborates with regional councils and organises and solves crisis situations. At the regional level, regions and municipalities assemble crisis management crews and other crisis management authorities (flood authorities). Following the end of conscription policies in 2004, the Armed Forces of the Czech Republic primarily emphasises securing effective defence measures, covering possible security risks, and securing international operations and air space. It also participates in select, non-military operations. The Czech

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Police Force falls directly under the Ministry of the Interior of the Czech Republic, and its priority is the protection of social interests, lives and well-being of citizens, and property. It collaborates with international organisations, and is headed by the police president.

The Czech Republic and its authorities becomes the second player (P2), which use possible security scenarios and security measures. Security scenarios are then the second player´s strategies. Let S2 be the set of strategies of the second player, then:

Def. 2
$S2 = (c_1,c_2,c_3,\ldots c_N)$ where N is natural number
c...the second player´s strategy

P2 tries to maximize its profit, and the reward is presented as to minimize the damage. P1 is indifferent player who causes damage for P2, while P2 wants to stop either or minimize it.

IV. Using Game Theory in the Czech Conditions

Application of GT in the Czech Republic has numerous specifics. It is often required to use the GT dealing with the decision making under uncertainty. While Czech Republic or its authorities can be considered a rationally thinking player with the ability to use different strategies, it is quite difficult to define positively Czech terrorist as rational player. As it was mentioned, Czech extremist and terrorist groups has its specific features.

a) Czech terrorists, that are those who are able and willing to use violence, mostly do not plan their actions thoroughly; acts of violence have often the character of a spontaneous attack with minimum events of an attack to an industrial object (e.g. terrorist attacks to company Biotest).
b) Czech terrorist groups show only a limited degree of organization. The structure and organization can be identified at the extremist associations acting within the Czech political scene, e.g. the Workers' Party of Social Justice. Such parties, regarding their position, resort to terrorist methods with a very low probability. Another problem area is the lack of homogeneity of the Czech terrorism that in principle makes it impossible to determine and further process the term “terrorist” or “terrorist group” as a generalized term enabling its further practical use.

Terrorist is understood to be the first player and the crisis events represent its strategies. The second player is Czech Republic that has set of scenarios presenting the use of resources, tools and rules used if there is the need to react. Functioning security system of the state must be able to highlight the crisis and advises authorities how to respond appropriately to involved danger. In this work, the proposed theoretical framework uses several scenarios and security rules, whose main objective is to inform and to advise how to rationally react after the terrorist attack. Proposed model use different scenarios which a tool of first response reaction. From the chapters come several significant facts that have influenced the direction of next steps:

a) Czech extremist and terrorist scene is diverse and there are numerous opinions and approaches from extremist tendencies operate in the Czech political system, ending armed groups theoretically able to carry out a terrorist attack, so it is very difficult to clearly define a terrorist and rely on numeric value (the amount of costs associated with the preparation of attack, attack and escape).
b) Attacks on private entities that meet the definition of a terrorist attack, has been in the past in the Czech Republic committed and valued at the cost to repair the damage.
c) Subsequent valuation of terrorist attack that is trigger of incident can be re - done by quantifying damages to property and the environment, and other related costs. Quantification of the loss of human lives is generally considered to be problematic

A. Developing a State Security Advisory System (SSAS)

GT is tool that captures the interactions, allows to model, and thereby helps to make rational decisions in crisis situations caused by terrorist attack. There is also need to define some degree of rules corresponding to the various degrees of risk, allowing, among other things, mutual cooperation of regional authorities a security forces

There are 4 threat levels and their respective security policies, in which the Low level should be constantly engaged as a preventative measure:

Low Level
- Maintain and develop communication with Emergency service, which helps in dealing with crisis situations.
- Include crisis communication into regional strategies.
- Identify competencies in case of evacuation and update evacuation plans.
- If possible, provide an alternative place where in case of emergency will work key authorities.
- Training staff in first aid.
- Training employee´s behaviour in case of occurring emergency, printing and distribution of brochures on this topic among citizens.
- Provide available information about behaviour in case of occurring emergency that can provide Emergency service.
- Be careful to suspicious activity.
- Ensure that all the necessary equipment for the ensuing emergency is ready to be deployed.

General Level
- Increase attention to suspicious activity.
- Cooperate with external experts in assessing security risks and proposed safety measures.
- Contact the other authorities for the coordination of activities in case of occurred emergency.

Medium Level
- Be sensitive to suspicious activity.

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- Use emergency plans, especially in the area of synchronization and continuity rescue operations.
- If necessary, support the existing security system through an external security firm.
- Apprise with current situation other authorities.

High Level

- Listen to the latest information from the radio.
- Focus on suspicious activity.
- Direct cooperation with employees, citizens, local government, Emergency service and other institutions operating in the field of crisis management.
- Prepare for difficult working conditions and limited resources.
- Ensure that all support for the company's employees (medical assistance, presence of experts in crisis management, psychologist).

B. Developing Security Scenarios

The initial decision is difficult in terms of lack of information and time constraints, while respecting the hierarchy:

a) To prevent human life
b) To prevent environmental damage
c) To prevent damage to property.

Scenarios and safety rules were designed to authorities had tool that will support the initial decision in a crisis situation that must be primarily:

a) Quick,
b) The most accurate in view of the nature of emergency,
c) Adequate to deploy resources.

There should be identified number of different security scenarios depends on each state but the key thing is that those scenarios capture first respond reaction after terrorist attack and coordinate decision making. According to demonstrating needs there is necessary simplifying, the first scenario is for emergency – Fire (EM1), the second Explosion (EM2) and the third Leakage of poison to air (EM3).

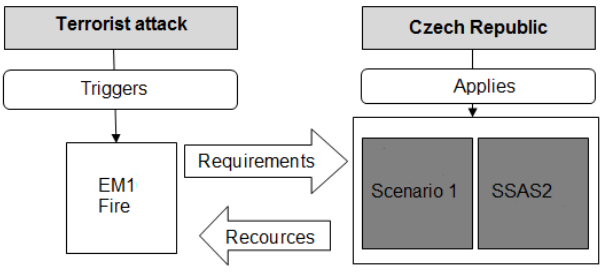

Figure 3 Fire, Scenario1 and SSAS2 [author]

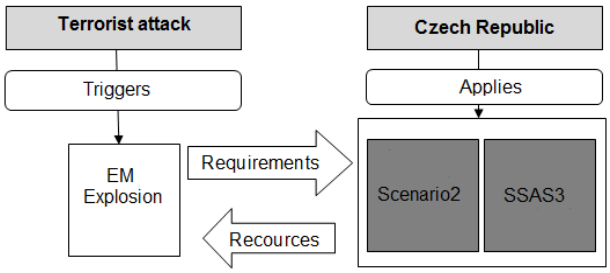

Figure 4 Explosion, Scenario2 and SSAS3 [author]

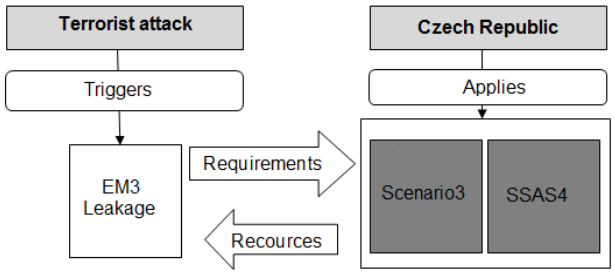

Figure 5 Leakage, Scenario3 and SSAS4 [author]

Individual combinations of scenarios may be analyzed using GT where P1 is represented by terrorist and P2 is Czech Republic based on these assumptions:

a) Terrorist or a terrorist group in the Czech Republic are not considered capable of rational and long - term planning.
b) To generalize the definition of terrorists and to use it when building the model is misleading in Czech conditions.
c) Games prisoner's dilemma - type or non - cooperative zero-sum games, which are used in research on international terrorism are not appropriate to create models in this work.

There are two types of games:

a) Games of intelligent players
b) Games of unintelligent players

Since the aforementioned conclusions regarding the Czech terrorist scene suggests that a terrorist under these conditions cannot be considered a rationally cognitive player, it is the optimal choice for the so-called game against nature. In this case, the Unintelligent player, often referred as nature, as that term expresses a large proportion of chance and irrationality in his behaviour, but also results from the application of GT in predictions of natural phenomena (weather, earthquakes, etc.).

Games against nature can be designated in terms of the knowledge of probability:

a) One player knows the probability with which events or strategy of the second player occurs. In this case, it is decision making under risk.
b) Player 1 does not know the probability with which events or strategy of the second player occurs.

In the case of this study, this represents decision making under uncertainty, since the division of the probabilities of

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terrorist attacks cannot be determined. In games under uncertainty arises the problem of specifying optimal choice of strategy against games of two rational players. Authors dealing with applications GT to international terrorism often use a zero - sum game, where one player gains the cost or "negative gain" and the other player, which does not seem to be suitable for this work. Decision making under uncertainty is the most problematic area of decision making, because there is no purely scientifically proven decision - making criteria. Optimal solution for games against nature is designed with tools that can be termed as principles or definitions of optimality (Minimax rule and Maximax rule, Laplace´s rule, Hurwicz´s rule, Savage´s rule) which can be used to determine the optimal strategy for games against nature (decision making under uncertainty), with the final choice is often performed by intuition, experience and the current conditions.

V. CONCLUSION

Effective management of crisis situations (in this case terrorist attacks and the associated) need to examine extremism and terrorism using new methods. Using of Game Theory as a decision – making tool has increased dramatically, especially after the 9/11. For this reason, the relation between terrorists and governments, private sector, citizens and other actors is in recent decades increasingly studied by Game Theory which becomes not only the means to study this issue, but also effective crisis management tool helping to create counter - terrorism strategy, policy and mitigation actions. Opportunity to present previously difficult measurable data with the numeric values with subsequent analysis and model creation opens a new space of research not only in the management of crisis situations and government policy making field but also in security science research.

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An Evaluation of 'Subjective Measures' on Different Levels of Performance by Learning Styles and Organisational Strategies: A Case of Higher Educational Institutions in Thailand

Vissanu Zumitzavan and Tudsuda Imsuwan

***Abstract*—** This study investigates the impact of learning styles and organisational strategies on sustaining competitive advantage. It study discusses how learning styles and organisational strategies are supportive to the universities in Thailand. Survey Questionnaires were distributed to samples of higher educational institutions in Thailand. Different statistical techniques were applied: descriptive statistics, Pearson's Correlation Analysis, and Hierarchical Multiple Regression Analysis. Findings discussed the extent to which the independent variables influence organisational performance.

***Keywords*—** Learning Styles, Organisational Performance, Organisational Strategies, Strategic Management.

I. Introduction

If it is to achieve outstanding levels of performance, an organisation may need to consider strengthening and creating a network or community of similar endeavours. With the approaching launch of the ASEAN Economic Community (AEC) in 2015, AEC members need to be well prepared. To accomplish this, individual members are required to develop economically, at the same time as reducing the differences between them. [1] indicated that deeper economic integration can lead to significant social costs caused by structural adjustments and the risk of falling into areas of low-cost labour, trapping applicable resources. Hence, it is necessary for the members of the AEC communities in superior economic positions to distribute their resources to the developing countries to ensure full participation of all members in the assimilation process. This includes financial and technical assistance, transfer of technology, education, training facilities and other capacity-building activities. Economic growth may be dependent on the development of the nation and its citizens, with human resources and education acting as key factors. Thailand's position is ambiguous. At present, there are 198 universities in Thailand [2], but more importantly the issue is not quantity but quality. Hence, any quality-focused higher educational institutions must ensure superiority in education for its registrants.

Higher educational institutions are perceived as essential factors in rapid economic growth, and formal education, controlled by the state, is indispensable for improving the production capacities of a population. In addition, organisational strategies must be proficient in enabling organisations to achieve and maintain competitive advantages and superior performance in the dynamic and competitive business environment [3]. This means that organisations must be able to respond and adapt to environmental changes [4].

Top management may have diverse backgrounds and different approaches to learning, so it is essential that they understand individual preferences for particular ways of learning [5]. Once they understand their own learning preferences, they will be able to apply their experience in their routine duties, and to learn and transfer their knowledge more efficiently and effectively. In turn, this will encourage learning throughout the organisation and enhance organisational performance overall.

Academic research into learning styles and organisational strategies, has recognised learning styles as one of the most expedient ways of gaining competitive advantage [6]. However, learning style extends far beyond a single area and is relevant to different disciplines, including contingency theory, organisational development, industrial economy, information theory and system dynamics, system theory, management science, production and operation management, social anthropology, sociology, psychology and organisational theory. It is founded on various theoretical assumptions that are complementary to each other in the understanding of learning styles [7-9].

For example, the Mutual Funds Marketing Group strives to develop a more collaborative culture and base their learning on the work of cross-functional work groups and improved communication [10]. Organisations need to challenge their own homogeneity of thinking by pursuing board members with positive sources of differences [11]. Two companies emphasised learning styles in different functions within the organisation: Motorola encouraged learning by providing rewards, looking at both the quality of products and processes, whilst the Mutual Funds Marketing Group focused on sharing knowledge among organisational members. These two companies are only an example of organisations

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encouraging learning; however, for other organisations, especially SMEs with different levels of resources (employees and investment), the results of applying learning in the organisation may be diverse.

Consequently, research in learning styles sustaining organisational strategies has examined the influence through organisational performance. It is obvious that understanding different learning styles in the organisation is supportive to constructing appropriate organisational strategies. For these reasons, applying learning styles can lead to developing and sustaining competitive advantage, and in the long term improving organisational performance.

A. *Research Conceptual Framework*

Fig. 1 The Links between the Demographics of Respondents, Learning Styles and Organisational Strategies through Organisational Performance

Independent variables: The demographics of respondents, number of employees and the learning styles. At the same time, the levels of organisational strategies in each organisation were investigated.

Dependent variable: Organisational performance; the top management of each higher educational institution was asked to evaluate their organisational performance, focusing on their financial performance compared with others in their sector.

Figure 1 illustrates the connection between learning styles, organisational strategies and organisational performance of the unit of study, higher educational institutions in Thailand. More specifically, in view of the forthcoming launch of the AEC in 2015, consideration is focused on the continually growing amount of knowledge sharing among the members of this association.

II. Related Literature

A. *The Evolution of Education in Thailand*

Thai education was first reformed by King Chulalongkorn, the fifth king of the Chakri Dynasty, who ruled Siam from 1868 to1910. The King's decree indicated his King's visionary and progressive views on education. He recognised that human resource development is critical to a nation's economic success and prosperity. Hence, education needs an important moral dimension; and finally, creativity and aesthetics are considered as important elements in education [12]. Thailand is a newly industrialising country, whose higher education system is in need of extra resources to develop academically and to compete with developed countries at a time when public spending has to be limited [13].

B. *Learning Styles*

Patterson et al. [14] suggested that, whether or not top management desires to influence the performance of their companies, the most important area to underline is the management of people. Although organisational learning is distinct from individual learning, they are closely interconnected. Organisations can learn separately from particular individuals, but individual members need to share formal and informal processes and structures through which learning can be undertaken and then diffused and transferred between the individual and groups Lundberg[15]. Kolb [16] identified learning which occurs in the organisation in terms of the cognitive viewpoint, that "individual learning is dependent on the learning arrangements that exist within the organisation, either accelerating or slowing the learning process" [17, p.187, 18, 19]. Michie and Oughton [20] recommended that if organisational members have a stake in the organisation in which they work, they will be more motivated and committed, with positive outcomes for organisational performance.

In addition, Duff [21] and Given [22] highlighted the fact that learning styles are a combination of characteristics: cognitive, affective and psychological aspects that act as indicators of how an individual interacts with and responds to the learning environment. Hence, learning styles can be defined as the way people process information effectively in their own manner. Honey and Mumford [23-26] suggested that learning styles can be classified into four different styles: Activist, Pragmatist, Reflector and Theorist. Finally, learning styles can be defined as the approaches people take in processing information effectively in their own way. They also play an important role in facilitating people to understand their own learning styles and adapt them to suit their organisational surroundings; in turn, they can transfer and encourage knowledge to others more effectively.

C. *Orgasational Strategies*

David [27] believed that the term organisational strategy is used synonymously with strategic management. He defines organisational strategy as the art and science of articulating, employing, and appraising cross-functional decisions that enable an organisation to achieve its objectives. Pearce and Robinson [28] proposed that organisational strategy describes a set of decisions and actions contributing to the formulation and implementation of plans designed to achieve a company's objectives.

Integral to organisational strategy is the determination of long-term goals and objectives of an organisation, serving as a framework within which choices are prepared concerning the nature and direction of the organisation [27, 29, 30]. This framework helps in distributing resources to develop financial and strategic performance [31]. Furthermore, there is the consideration of the continually growing numbers of educational

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institutions. Increasing requirements for study may affect the competitiveness of educational organisations. To be effective, universities need to employ strategies through a wide variety of activities to offer superior value. The organisational strategies can help to determine those activities. Kotler [32] proposed three key organisational strategies: cost leadership, product differentiation, and niche market, to meet customers' needs and achieve competitive advantage in their sector.

First, cost leadership typically focuses on ways to lower cost. For example, in higher education, it may be useful to introduce e-learning programmes to lower costs as a cost leadership strategy. (See, for example, [33, 34]

Second, product or service differentiation distinguishes a firm from its competitors. For example, universities may offer new or different courses or programmes of study to meet the needs of the market. (See, for example, [35]. This is especially important with the growth of the international market for academic, curricular internationalisation, and the commercialisation of international higher education can increase profit in the higher education sector [36]. For instance, Thailand has incorporated the internationalisation of higher education into its plans since 1990, and 'international programmes' are offered in both public and private universities [37]. Product differentiation may be more effective when students are not price sensitive, since knowledge can be considered as a first investment. Hence, universities applying this strategy may be able to acquire even more exceptional registration figures. More specifically, any organisation that can offer a unique programme of studies, may then be more attractive to students, who recognise that this university possesses specialised knowledge that is rare in other institutions.

Third, in niche marketing strategy, organisations concentrate on serving a specific group of students with similar demographics and a similar need or want. For example, the higher institutions may focus solely on students living in the countryside far from the capital, by offering a new branch close to their communities [38].
The education sector has emerged through the new technology as a viral tool to satisfy new scenarios for both learning and teaching [39]. Thus, technology can be used for remote study and particularly for home school study.

D. Organisational Performance

The subjective and objective measures were identified during the process of data collection to identify the different levels of organisational performance of each higher educational institution in Thailand. To do so, top managements were asked to evaluate their level of performance compared with their competitors.

E. Research Question

The research is designed to answer the question: 'To what extent are the learning styles of top management supportive to the institution through organisational strategies?' The research question has been formulated to investigate the relationship between learning styles, organisational strategies, and organisational performance.

III. Sample and Data Collection

There are 198 universities in Thailand [40]. Samples were classified by the Stratified Random Sampling method, ensuring that they were equitably selected with different locations. Prior to conducting the questionnaire, postal letters, e-mails and telephone calls were made to arrange times and to ascertain that these top managers were willing to participate in this survey. Respondents were assured of the confidentiality of their answers.

Questionnaires were distributed to top management of the universities in Thailand, using Krejcie and Morgan's formula to determine sample size [41]. Their table recommends that a population of 198 requires a sample size of no less than 121. Meanwhile, Ames [42] suggests that mail surveys can be expected to have response rates of 11 to 15 per cent. In this study, however, questionnaires were sent out to all 198 universities. A total of 135 completed questionnaires were received, which amounted to the impressive response rate of 68.18 per cent and would improve the validity of the research and generalisability of the findings. More precisely, Hair et al [43] suggest that a ratio of 5:1 is the standard to achieve to ensure that the data collected adequately reflects the phenomenon being studied; that is, taking into account all the independent variables, a sample that is at least one-fifth of the target population size is required. Thus, the high response rate could further contribute to the representativeness of the data collected. In this study, ten independent variables were analysed: gender, age, income, experience, number of employees, activist, pragmatist, reflector, theorist, and organisational strategies. To ensure reliability and validity, a pilot study was carried out before conducting the actual questionnaire.

The questionnaire was composed of four sections: demographics, learning styles, organisational strategies and organisational performance. The first section comprised demographic questions relating to gender, age, income and experience, while the number of employees is a controlled variable. The second and third sections used a 1-6 Likert scale [44] where 1 was the least and 6 the most agreed. In the last section, top management were asked to evaluate their organisational performance by focusing on financial performance, by providing a percentage score against other organisations in their sector.

A. Validity

Balnaves and Caputi [45] proposed three main kinds of validity: construct, internal and external. Construct validity determines whether the construct of the research is successfully operationalised and represents the phenomena relating to the research objective. In this study, the unit of analysis is the top management of the universities in Thailand, qualified to provide accurate

data grounded on their understanding. Internal validity refers to the extent to which the research design allows researchers to draw conclusions around the relationships among variables. In this research, using the quantitative approach, different statistical techniques were applied to test these relationships. Burns [46] suggested that the standardised test is helpful in forming an important part of the body of necessary information. Hair et al. [43] recommended that the most common test for normality is the Kolmogorov-Smirnov test which determines the level of significance of the differences from a normal distribution. The most commonly used significant level is 0.05. Hence, the organisational performance was verified for the normality by using the Kolmogorov-Smirnov test. The results indicated that the significance level of the sample was greater than 0.05. So, it can be concluded that the sample had a normal distribution, and conforms to acceptable formats.

In contrast to the other types, external validity reflects the degree to which the samples are actually representative of the population from which they were drawn. In this study, the respondents were stratified according to their location to ensure that each sample from the different locations had an equal chance of being selected. A probability or random sample technique was then applied to select the samples. This means that the samples were randomly selected, contributing further to the generalisability of the data gathered.

In addition, the questionnaire was sent to professional proof readers based in the UK and Thailand in order to check the translation from English to Thai and from Thai to English. This was necessary to ensure that the respondents shared the same understanding of the phrases applied in every single question. All respondents were also assured of the highest level of confidentiality of data, which were used for academic purposes only. Respondents were also notified that a copy of the results would be provided, although no individual names would be identifiable from the published information.

B. Reliability

Reliability refers to the stability, accuracy and dependability of data [46]. Also, a valid question will enable accurate data to be collected, and one that is reliable will mean that the data is collected consistently [47]. Foddy [48] suggested that "the question must be understood by the respondent in the way intended by the researcher and the answer given by the respondent must be understood by the researcher in the way intended by the respondent". Saunders et al. [47] suggested that "internal consistency" involves correlating the responses to each question with answers to other questions in the questionnaire. It therefore measures the consistency of responses across either all the questions or a sub-group from the questionnaire.

The most frequently used method for calculating internal consistency is Cronbach's alpha coefficient [47], which was applied to ensure the level of reliability (see Table I). The results for the set of questions on learning styles suggest that activist was equivalent to 0.830, pragmatist to 0.852, reflector to 0.880, and theorist to 0.835. For organisational strategies, cost leadership was equivalent to 0.824, product differentiation to 0.804, and niche market to 0.815. Therefore, it was found that the levels of Cronbach's alpha coefficient for both learning styles and organisation strategies were acceptable for an attitude scale.

Table I: Reliability of the Instruments

Variables	Cronbach's Alpha	Number of Items
Activist	0.830	5
Pragmatist	0.852	5
Reflector	0.880	5
Theorist	0.835	5
Cost Leadership	0.824	4
Product Differentiation	0.804	4
Niche Market	0.815	4

IV. Data Analysis and Discussion

A sequential or hierarchical analysis of a set of independent variables may often produce the coefficients necessary to answer the scientific questions at hand. In the hierarchical form, the set of independent variables is entered cumulatively in the R^2 and partial regression and correlation coefficients are determined when each independent variable joins the others [49]. A full hierarchical procedure for a set of independent variables consists of a series of regression analyses, each with one more variable than its predecessor. The choice of a particular cumulative sequence of independent variables is made in advance, as indicated by the purpose of the research. Moreover, the researcher should be guided by the theoretical foundation that originally led to the research question [50]. The higher the correlation between the independent and dependent variable, the better prediction equation they will provide [51]. This research framework has three main groups of independent variables: demographics of respondents and number of employees; learning styles; and organisational strategies. Consequently, the relationship between independent and dependent variables was tested to attain the results precisely, and hierarchical regression analysis was applied.

A. Hypotheses

H_1: Different demographics of respondents and number of employees lead to different levels of organisational performance.

H_2: Different learning styles lead to different levels of organisational performance.

H_3: Different levels of organisational strategies (cost leadership, product differentiation, and niche marketing) lead to different levels of organisational performance.

H_4: The relationship between demographics of respondents and number of employees, learning styles, and organisational performance are mediated by organisational strategies.

B. Multicollinearity

It was found that the tolerance of each predictor was no lower than 0.100 and the VIF did not exceed 3.16, the limit suggested by [43], so multicollinearity does not appear to be present. Nevertheless, given the size and cross-sectional nature of the data, multicollinearity and its implications for the interpretation of the results cannot be ruled out completely.

V. Findings

Rather than looking for a statistical solution, the researcher should be guided by the theoretical foundations that originally led to the research question [50]. This suggests that the researchers select the most appropriate independent variables to predict a dependent variable. Therefore, in this section, hierarchical regression analysis was performed to examine the direct effects of number of employees, demographics, learning styles and organisational strategies on the dependent variable, organisational performance. In accordance with the theoretical framework of this research, number of employees and the set of demographics of respondents (age, gender, income and experience) were initially entered, followed by learning styles (activist, pragmatist, reflector, and theorist), and organisational strategies. Three hierarchical regression analyses were required to test for organisational performance.

Table II: Model Summary (Number of Employees and Demographics of Respondents, Learning Styles, and Organisational Strategies).

Model predictors	Sig	R^2	Adjusted R^2
Model 1: Number of Employees, Gender, Age, Income, and Experience	0.000	0.373	0.112
Model 2: + Activist, Pragmatist, Reflector, and Theorist	0.000	0.611	0.291
Model 3: + Cost Leadership, Product Differentiation, and Niche Market Strategies	0.000	0.726	0.699

Dependent Variable: Organisational Performance

Model 1 (see Table II) with number of employees, gender, age, income, and experience as independent variables, has $R^2 = 0.373$. This means that those independent variables could explain the dependent variable, organisational performance, approximately 37.3%. After some independent variables are added to Model 2, R^2 increased to 0.611. Model 3 clearly shows that once the organisational strategies, cost leadership, product differentiation, and niche market strategies, were added, Adjusted R^2 increased to 0.726. In addition, Hair et al [43] recommend that R^2 is the best standard to use when comparing regression models. Therefore, it can be concluded that the set of independent variables in Model 3 is the most valuable in predicting the dependent variable.

H_0: $\beta_1, = \beta_2 \ldots = \beta_k = 0$, there is no significant linear relationship between the set of predictors composed of number of employees, gender, age, income, and experience, activist, pragmatist, reflector, theorist, cost leadership, product differentiation, niche market strategies and the dependent variable, organisational performance.

H_1: $\beta_i \neq 0$, i = 1, 2… k, there is a significant linear relationship between the set of predictors composed of number of employees, gender, age, income, and experience, activist, pragmatist, reflector, theorist, cost leadership, product differentiation, niche market strategies and the dependent variable, organisational performance.

The results of ANOVA show a P value of 0.000, which is less than 0.05; therefore, the null hypothesis is rejected (see Table II). It can be concluded that number of employees, demographics of respondents, learning styles, and organisational strategies have an impact on organisational performance resulting in the acceptance of hypotheses 1 to 3. Once, a set of independent variables impacts on a dependent variable, the prediction equation can be ascertained.

A. Beta Coefficient

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12}$$

Where:

Y = Organisational Performance
β_i = Beta Coefficient
X_1 = Gender
X_2 = Age
X_3 = Income
X_4 = Experience
X_5 = Number of Employees
X_6 = Activist
X_7 = Pragmatist
X_8 = Reflector
X_9 = Theorist
X_{10} = Cost Leadership
X_{11} = Product Differentiation
X_{12} = Niche Market

B. Model Predictors

Organisational Performance = 0.019 (gender) + 0.016 (age) + 0.010 (income) + 0.020 (experience) + 0.112 (number of employees) – 0.273 (activist) + 0.120 (pragmatist) + 0.262 (reflector) + 0.039 (theorist) – 0.020 (cost leadership) + 0.351 (product differentiation) + 0.088 (niche market).

From the prediction equation, it was found that the most powerful predictor in the Standardised Coefficient Equation was product differentiation (Beta Coefficient = 0.351). It indicated that this strategy has a positive relationship with organisational performance, followed by activist (Beta Coefficient = -0.273) which has a negative

relationship with organisational performance. Next, the Beta Coefficient of reflector is 0.262. The results suggest that reflector has a positive relationship with organisational performance.

Hence, it can be concluded that different demographics of respondents, learning styles, and organisational strategies led to different levels of organisational performance. Therefore, hypothesis 1, 2 and 3 were accepted.

In addition, as can be seen from Table III, it was found that the tolerance of each predictor was not lower than 0.100 and the Variance Inflation Factor (VIF) did not exceed 3.16. In line with Hair et al.'s [43] guidelines, no evidence of multicollinearity was found.

C. Mediation Testing

Table III: Coefficient (Standardised Coefficients of 1st and 2nd Equations)

Variables	Standardised Coefficients (1st Equation)			Standardised Coefficients (2nd Equation)		
	Sig	**R^2**	**Adjusted R^2**	**Sig**	**R^2**	**Adjusted R^2**
	0.000	0.638	0.611	0.000	0.726	0.699
	Beta	**Tolerance**	**VIF**	**Beta**	**Tolerance**	**VIF**
Gender	0.034	0.913	1.096	0.019	0.888	1.126
Age	-0.045	0.405	2.468	0.016	0.384	2.608
Income	0.052	0.956	1.046	0.010	0.919	1.088
Experience	0.059	0.415	2.408	0.020	0.392	2.548
Number of Employees	0.135	0.525	1.905	0.112	0.519	1.928
Activist	-0.371	0.555	1.801	-0.273	0.485	2.061
Pragmatist	0.167	0.795	1.258	0.120	0.780	1.283
Reflector	0.322	0.684	1.463	0.262	0.636	1.572
Theorist	0.076	0.679	1.472	0.039	0.661	1.512
Cost Leadership	-	-	-	0.020	0.859	1.163
Product Differentiation	-	-	-	0.351	0.669	1.494
Niche Market	-	-	-	0.088	0.831	1.203

Dependent Variable: Organisational Performance

1st Equation: organisational performance = α number of employees and demographics of respondents + α learning styles

2nd Equation: organisational performance = α number of employees and demographics of respondents + α learning styles + α organisational strategies

Hair et al [43] strongly suggest using the adjusted R^2 in comparing models with different numbers of independent variables. The adjusted R^2 is also useful in comparing models with different data sets because it will compensate for the different sample size. Hence, in this study, the adjusted R^2 was considered for comparing between two equations. It was found the adjusted R^2 for the second equation was 0.699, which is greater than the adjusted R^2 of the first equation, 0.611. This indicates that the set of independent variables in the second equation explains the dependent variables more fully than the set of independent variables in the first equation. In addition, when adding the organisational strategies into the equations, the Beta Coefficient values of the learning style variables changed. This suggests that the effect of learning styles on organisational performance was mediated by organisational strategies. Hence, hypothesis 4 was accepted. It can be concluded that the relationship between demographics of respondents, learning styles, and organisational performance are mediated by organisational strategies.

VI. Recommendations

The results suggest that the set of predictors was statistically associated with the dependent variable. Moreover, findings indicate that top managements' demographics, learning styles and organisational performance were mediated by organisational strategies. This suggests that it may be necessary to provide learning

style programmes to encourage top management to practise the predominant components of those learning styles (i.e. pragmatist and reflector). In particular, therefore, it would be helpful for top management to encourage learning in the organisation by applying the effective learning styles, pragmatist and reflector, to transfer knowledge and skills to the employees.

Furthermore, top management may need to encourage employees to distribute ideas and then try them out in practice. At the same time, top management may need to take some time to consider and gather the information. It is also important that top management should undertake problems by analysing and observing them from different perspectives and then refining the alternative ways of approaching them.

Therefore, any organisation desiring to improve its organisational performance may need to encourage top management to maintain the organisational strategies: cost leadership, product differentiation, and niche market. For example, González [52] suggested that a split mode of studies is an alternative education system considered to be one of the most cost effective [53, 54]. In addition, McDermott and Walston [55] found offering new disciplines of study and strengthening the unique characteristics for students as an executive programme for top management in a business school was considered useful for working people considering pursuing higher education. Also, specific groups of students, such as organisational members from business and academic areas, remain the groups to be considered since they are seeking to attain tacit and explicit knowledge to improve productivity in their workplaces [52, 56].

VII. Implications and Future Research

There are several implications suggested by these findings. First, the impact of learning styles on organisational performance may need to be observed over a long period of time in a longitudinal study. Thus, time limitation is one of the difficulties in conducting research.

It is also recommended that future studies consider other groups relevant to the organisation, apart from top management. In this research, top management was specifically approached to complete the questionnaires. However, their perceptions and accounts may not be sufficiently comprehensive in understanding the contribution of learning styles and organisational strategies to organisational performance. It is thus strongly recommended that the views of other potentially useful respondents from different positions be taken into consideration for cross-checking purposes. More specifically, it may prove useful for future studies on organisational performance to include the views of a wider range of respondents other than top management themselves, such as other organisational members, subordinates or students.

In addition, as this study mainly relies on the quantitative approach, it may not offer a complete understanding of the complex relationships in organisations. Hence, to improve the validity of future research, it may be necessary to combine qualitative and quantitative methods to triangulate the findings.

VIII. Conclusion

This research explains the relationship between the demographics of respondents, learning styles, organisational strategies, and organisational performance. The findings suggest that pragmatist and reflector learning styles are supportive to the organisation. In addition, organisational strategies act as a mediator between the demographics of respondents, learning styles and organisational performance. Hence, the empirical findings suggest that the set of predictors in this research can be used as guidelines for top management to improve organisational performance overall.

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The determining factors of the dry bulk market freight rates

Ghiorghe I. Batrinca and Gianina S. Cojanu

***Abstract*—**As an inherently volatile industry, shipping is characterized by a high risk – high return profile, making its rates and prices difficult to forecast. In shipping industry, investment decisions are taken on a proper risk measurement and management basis, since they are long-term decisions with important financial implications. Taking in consideration the importance of risk measurement and management within the investment environment, the purpose of this study is to provide a proper risk measurement solution for freight-rate risk.

***Keywords*—**BDI, Freight, GDP, Regression.

I. Introduction

The maritime industry represents a vital link in international trade, providing an efficient method of transporting large volumes of basic commodities and finished products. In 2012, more than one-third of all international seaborne trade consisted of dry bulk cargo. The importance of the dry bulk industry lies in the fact that without the estimated 4 billion tons of dry bulk cargo transported by sea, global trade and industry would not be maintained.

Dry bulk shipping can be defined as the maritime transportation segment associated with transporting commodities in bulk, rather than containerized or palletized. Dry bulk cargo is shipped in large quantities and can be stowed in a single hold with diminished risk of cargo damage. Dry bulk cargo is categorized as either major bulk or minor bulk. Major bulk cargo represents the vast majority of dry bulk cargo by weight, and comprises, among other things, iron ore, coal and grain. Minor bulk cargo represents the balance of the dry bulk industry, and comprises agricultural products, mineral cargoes, cement, forest products and steel products. Dry bulk shipping covers a variety of trades and the main of them are represented by iron ore, coal, grain plus bauxite, alumina and phosphates. Iron ore, steam coal and grains are affected by seasonal demand fluctuations. Bulk cargo can be very dense, corrosive or abrasive causing safety problems.

Dry bulk shipping is segmented by ship size, with the largest ships being capable of carrying over 300 000 tonnes of cargo. The first specialized bulk carrier was built in 1852, and since then, the process of development continued, causing the ships to grow in size and sophistication in order to maximize capacity, safety and efficiency. The main types of bulk carriers include Handies, Panamax and Capesize. Other dry cargo ships comprise OBOs (ore/bulk/oil carriers or Combination Carriers) and VLOCs (very large ore carriers). The "Vale Brasil" holds the title of the world's largest dry vessel with a deadweight of 402 347 tonnes.

The dry bulk carrier demand is determined by the underlying demand for commodities transported in dry bulk carriers. During the 1980s and 1990s seaborne dry bulk trade increased by approximately 2% on an average annual basis and between 1990 and 2006 the overall increase was of 35%. The dry bulk carrier demand is indirectly influenced by trends in the global economy and more specific by changes in gross domestic product and industrial production. Sometimes, the evolution of the dry bulk carrier market is driven by certain powerful economies such as Japan and China.

The dry bulk carrier supply is influenced by vessel deliveries and loss of existing vessels through scrapping or other circumstances requiring removal. The supply of dry bulk carrier is also the result of the operating efficiency of the worldwide fleet.

The balance between vessel supply and demand acts as a function for dry bulk charter rates computation. Dry bulk charter rates are different from one charter contract type to another and also from one vessel type to another. Generally, charter hire rate of larger ships are more volatile than those for smaller vessels. The most representative charter hire rate references of the dry bulk shipping market are the freight rate indices produced by the Baltic Exchange, which are calculated every market day from data supplied by a panel of independent shipbrokers.

II. LITERATURE REVIEW

In spite of the dry bulk shipping importance, research papers on dry bulk market rates are scarce.

As the freight charge of dry bulk cargo holds a major share of supply chain cost, it is important for supply chain participants to understand the determining factors of the bulk freight market. Shen and Lo (2012) investigate the short-term and long-term causality relationship between the Baltic Dry Index and the gross domestic product of the BRIC (Brazil, Russia, India and China) countries by applying the equilibrium analysis and Granger's causality test. Their research confirms the existence of short-term and long-term equilibrium relationships between BDI and GDP in the case of China. Also, no significant causalities were found between the BDI and the GDP of Brazil, Russia and India.

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Jing et al. (2008) analyze the characteristics of volatility in dry bulk freight rates of different vessel sizes by applying GARCH and EGARCH models on a sample of daily returns of freight rate indices collected for the period 1999 – 2005. The authors noticed that the shocks will not decrease but have the tendency to strengthen. Moreover, external shocks on the market have a different influence on volatility in different types of vessel due to their distinct flexibility. They have also investigated the asymmetric impact between past innovations and current volatility, noticing that the asymmetric characters are distinct for different vessel size segments and different market conditions due to the different flexibility and different commodity transport on different routes.

Merikas et al. (2013) apply copula models on the Clarkson's dataset for the last 20 years in order to reconstruct joint distribution of time charter rates for dry bulk ship. The authors have implemented a system of criteria for copula selection based on goodness-of-forecast criteria. Also, they have used a homogenous dataset in terms of copula structural shifts' absence. According to the research results, dry bulk time charter rates weekly returns exhibit symmetric distribution. The analysis performed in this paper is useful for portfolio optimization.

The global economic crisis has strongly affected the international shipping industry. In this context, the freight rates for the dry bulk market have sharply decreased. Li et al. (2009) investigate the features of the dry bulk market taking in consideration the market deteriorating conditions. The authors analyze the demand and the supply, providing predictions and suggestions for dry bulk shipping companies to help them face risks. According to their research, the demand is shrinking, while the supply is affected by the aggravated financial situation of carriers.

Guo et al. (2009) examine the international dry bulk freight rates during 2003 - 2008 by applying qualitative analyses on the composing factors of the dry bulk shipping market. Moreover, they investigate the features of mutual action of the world dry bulk demand and supply by applying structural equation model. The research results highlight the fact that, from the perspective of demand and supply, the dry bulk fleet supply market is of a greater impact for freight transport, making the international dry bulk cargo transport market a seller's market.

Please submit your manuscript electronically for review as e-mail attachments.

III. DATA AND METHODOLOGY

In this study, a multiple OLS regression was applied in order to analyze the relationship between the Baltic Dry Index and the most important determining factors of the dry bulk market rates, namely the worldwide dry bulk demand, the worldwide dry bulk supply and the worldwide gross domestic product. The annual data series of Baltic Exchange Dry Index, worldwide dry bulk demand, worldwide dry bulk supply and worldwide gross domestic product for the period 1985 – 2012 were used for the empirical study. Data were collected from Baltic Exchange database and UNCTAD database and the analysis was performed with EViews 7. This kind of analysis may provide a better understanding of the dry bulk shipping market by revealing information regarding the mechanism and the determining factors of the dry bulk market rates.

A multiple OLS regression is concerned with the relationship between a dependent variable and a series of "m" independent variables. This type of regression is useful because it allows the analyst to control for the multiple factors that simultaneously affect a dependent variable. Mathematically, a multiple OLS regression can be represented as follows:

$$y_i = b_0 + b_1 x_{1,i} + b_2, x_{2,i} + ... + b_m x_{m,i} + \varepsilon_i \quad (1)$$

where the coefficient b_0 is the vertical intercept and the "m" coefficients b_1 to b_m are the slope coefficients. Each coefficient b_j for j>0 represents the change in y_i induced by a change in variable $x_{j,i}$ holding all other variables constant.

In order to achieve the goal of the research analysis, the following multiple OLS regression was build based upon the dependent variable represented by the Baltic Exchange Dry Index and three independent variables represented by the worldwide dry bulk demand, worldwide dry bulk supply and worldwide gross domestic product:

$$BDI = b_0 + b_1 * demand + b_2 * \sup ply + b_3 * GDP + \varepsilon \quad (2)$$

The Baltic Exchange Dry Index was chosen as the image of dry bulk market rates because, according to Alizadeh and Nomikos[1], this index is widely used by practitioners as a general market indicator reflecting the movements in the dry bulk market, being considered as the "barometer" of dry bulk shipping.

IV. EMPIRICAL ANALYSIS

Firstly, the ADF test (Augmented Dickey-Fuller) was applied in order to verify the stationarity of time series. A time series is said to be stationary if its mean, variance and its covariances remain constant over time. From an economic point of view, shocks to a stationary time series are temporary and, over time, the effects of the shocks will dissipate. According to Table 1, the existence of a unit root was estimated for the original data and the absence of a unit root for the first-difference logarithmic data (BDI, demand and GDP) and for the second-difference logarithmic data (supply). Usually, the econometric analysis is performed with logarithmic series because it facilitates the interpretation of regression coefficients. Therefore, the variables BDI, demand and GDP are integrated of order 1 and denoted by l(1), and the variable supply is integrated of order 2 and denoted by l(2).

Table 1. ADF test logarithm

BDI		**Demand**		**Supply**		**GDP**	
l(0)	**l(1)**	**l(0)**	**l(1)**	**l(0)**	**l(2)**	**l(0)**	**l(1)**
H0: The time series has a unit root (non-stationary)							
0.3524	0.0013	0.9485	0.0001	1	0.0002	0.5919	0.0065

If the probability is lower than the significance level, the null hypothesis is rejected. It can be observed that the first-

[1] Amir H. Alizadeh and Nikos K. Nomikos – Shipping Derivatives and Risk Management, Palgrave Macmillan, 2009

difference logarithmic data is stationary for a 5% significance level (BDI, demand and GDP) and the second-difference logarithmic data is stationary for a 5% significance level (supply).

After testing stationarity, the model of the multiple OLS regression can be created by using the stationary logarithmic time series.

Table 2. The output of the multiple OLS regression

Variable	Coefficient	Std. Error	t-Statisti
C	-0.299038	0.106784	-2.80040
DL_DEMAND	0.434638	1.251157	0.34738
D2L_OFFER	-8.512831	3.246002	-2.62255
DL_GDP	5.380939	1.268717	4.24124

R-squared	0.520918	Mean dependent var	0.574441
Adjusted R-squared	0.455589	S.D. dependent var	0.767994
S.E. of regression	0.300581	Akaike info criterion	
Sum squared resid	1.987680	Schwarz criterion	
Log likelihood	-3.467732	Hannan-Quinn criter.	
F-statistic	7.973718	Durbin-Watson stat	
Prob(F-statistic)	0.000884		

Source: own estimations

According to Table 2, the probabilities of t-Statistic test are lower than the 5% significance level for all the coefficients, which means that the null hypothesis is rejected. Thus, all the coefficients are statistically significant. These results are confirmed by F-statistic test, which assesses how well independent variables explain the evolution of the dependent variable. The probability of F-statistic test is lower than the 5% significance level, which means that the null hypothesis is rejected. Therefore, at least one of the coefficients is statistically significant.

According to Table 2, R-squared is higher than 50%, which means that the independent variables explain over 50% of the dependent variable's variance. Thus, the model of the regression can be considered adequate.

The model of the regression is considered to be valid, if certain hypotheses are accepted. The first hypothesis tests the normality of residuals (Figure 1). The probability of Jarque-Bera test is higher than the 5% significance level, Skewness is ≈ 0 and Kurtosis is ≈ 3, which means that residuals have a normal distribution.

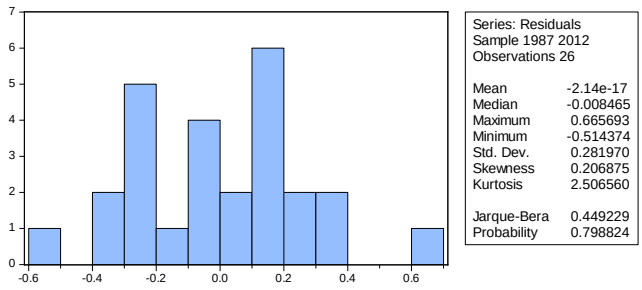

Fig 1. Normality of residuals

The second hypothesis tests the autocorrelation of residuals. According to Figure 2, the probabilities of Q-Stat are higher than the 5% significance level, which means that there is no serial correlation of residuals. The absence of autocorrelation of residuals is confirmed by the Breusch-Godfrey LM Test whose probabilities are higher than the 5% significance level.

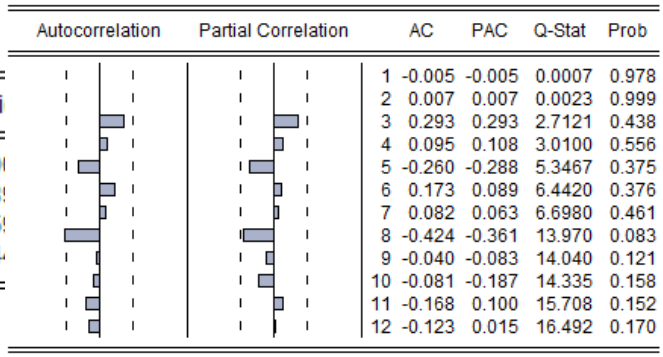

Fig. 2 Autocorrelation of residuals

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.000977	Prob. F(2,20)	0.9990
Obs*R-squared	0.002540	Prob. Chi-Square(2)	0.9987

Fig. 3 Breusch-Godfrey LM Test

The last hypothesis tests the homoskedasticity of residuals (the existence of ARCH terms) through autocorrelation of squared residuals. According to Figure 3, the probabilities of Q-Stat are higher than the 5% significance level, which means that there is no serial correlation of squared residuals. The absence of autocorrelation of squared residuals is confirmed by the ARCH Heteroskedasticity Test whose probabilities are higher than the 5% significance level.

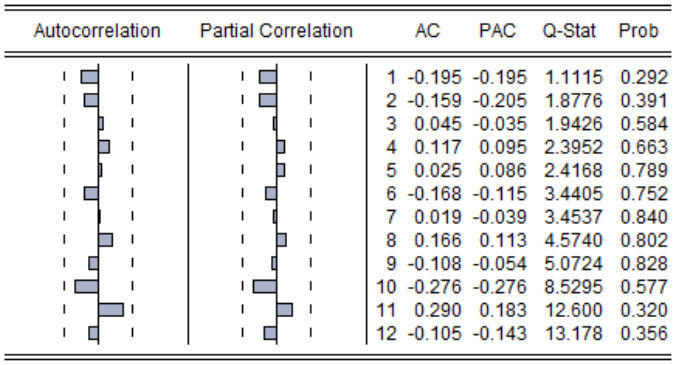

Fig. 4 Homoskedasticity of residuals

Heteroskedasticity Test: ARCH

F-statistic	0.912868	Prob. F(1,23)	0.3493
Obs*R-squared	0.954369	Prob. Chi-Square(1)	0.3286

Fig. 5 Heteroskedasticity Test ARCH

Finally, if the previous hypotheses are accepted, the stability of the equation and its coefficients can be tested. Fig 6 shows the CUSUM test which computes the cumulative sum of the equation's recursive residuals. It can be noticed that the

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equation and its coefficients are stable because the cumulative sum fluctuates between the two critical lines.

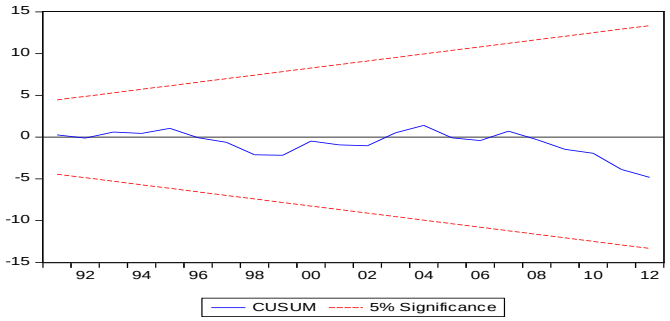

Fig. 6 CUSUM stability test

V. CONCLUSIONS

The results of the empirical analysis show that the relationship between the Baltic Dry Index and the most important determining factors of the dry bulk market rates, namely the worldwide dry bulk demand, the worldwide dry bulk supply and the worldwide gross domestic product, can be expressed as follows:

$$BDI = -0.299 + 0.435 * D - 8.513 * S + 5.381 * GDP + \varepsilon \quad (3)$$

The worldwide demand has a positive influence on the dry bulk freight market while worldwide dry bulk supply has a stronger influence on dry bulk market rates, but with a negative sign, due to the fact that an increasing extra-capacity of vessels will lead to smaller freight rates. However, the influence of demand and supply on dry bulk freight rates should be analyzed by taking in consideration the market price mechanism which balances the forces of the two variables, leading to an equilibrium price.

Shipping industry is vital for international trade because it accounts for the highest volume of transported commodities and finished products. The development of international trade depends on the development of the world economy. Therefore, the worldwide gross domestic product has a positive influence on freight rates.

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Knowledge management implications for the development of multicultural competencies in Slovak enterprises

Woolliscroft Paul, Cagáňová Dagmar, Šujanová Jana, Čambál Miloš, Szilva Ivan, Jakábová Martina

***Abstract*—**The phenomenon of globalisation has been prevalent throughout the last decade of 20th century and is still a significant factor influencing both organisations today. Despite globalisation being a defining feature of international business for decades, it is a recent development in Slovakia, since the accession of the country as a member of the EU.

As workplaces in Slovakia become more culturally diverse, the challenge of managing a multicultural workgroup has become imperative to ensure success. To utilise multicultural management competencies effectively, it is crucial to establish a clear understanding of the competency approach and develop a model of knowledge management as a means of competitive advantage.

This research paper builds upon previous research developing a model for knowledge management of multicultural management competencies. It assesses the impact of management styles upon the knowledge management process by means of a comparative analysis of the management approaches Slovakia and the United Kingdom.

***Keywords*—** Human Resource Management**,** Knowledge Management, Intercultural Management, National Culture, Multicultural Competencies.

I. INTRODUCTION

The phenomenon of globalization has been prevalent since the last decade of 20th century and remains a significant factor influencing the effective management of organizations. As workplaces have become more diverse, multicultural management and the development of intercultural management competencies have gained increased prominence. This importance stems from the fact that the world is not a homogenous 'monoculture" and organisations increasingly face two simultaneously evolving issues of the challenges presented when companies move to new, often culturally different locations; and increased labour mobility resulting in diverse workplaces where people from different cultural backgrounds share their work experience. Despite the long-established worldwide trend towards globalisation, the development of multicultural practices in Slovakia is a relatively new phenomenon accelerated by foreign direct investment (FDI) by MNCs and entry into the EU in 2004. The recent growth of internationalisation in Slovakia has subsequently led to a considerable amount of interest amongst business enterprises and academics.

This research paper investigates the necessity to develop a robust model of knowledge management as a means of understanding and effectively utilising multicultural management competencies. Secondly the paper will also explore the extent to which it is necessary to integrate a specific understanding of national and corporate management styles into existing frameworks for the development of management competencies. The paper aims to do so by assessing the approach to management in the United Kingdom compared with the Slovak Republic. Multicultural competencies will also be assessed at an international level to draw more generalised conclusions.

As a result, the aim of this paper is to develop a more clear and coherent model for the effective management of multicultural workgroups within Slovak enterprises. The empirical basis for the study took the form of a structured survey of 97 managers working both within Slovak enterprises and global enterprises. The survey findings are supported by the authors own experience over a number of years working for organisations in the United Kingdom and Slovakia combined with observational research conducted within UK and Slovak enterprises..

II. MULTICULTURALISM AND THE DEVELOPMENT OF INTERCULTURAL MANAGERIAL COMPETENCIES

Multiculturalism refers to a situation in which three or more different ethnic cultures exist and where subcultures may exist, rather than just two cultures [1]. Reference [2] stated that being able to manage a multicultural workforce refers to the ability to manage, communicate and lead people from across a range of cultures simultaneously. A large body of existing literature deals with defining multiculturalism and identifies management competencies within the workplace [3],[4],[5].

As workplaces in Slovakia become more culturally diverse,

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the issue of managing a multicultural workgroup has become important for those involved in the management of human resources. With a culturally diverse group of workers participating in the workforce, managers increasingly need to take into account the impact of different cultures within their work teams. It is evident there is a genuine need to train and develop managers to become competent in managing a multicultural team. Reference [6] in their review of research on diversity in organisational groups suggested that diversity in workgroups (including multicultural workgroups) may affect outcomes such as turnover and performance through its impact on communication processes. For the managers of multicultural workgroups, [7] suggested that the manager's competencies in dealing with diversity issues may have an impact on affective outcomes such as how people feel about their employers and their jobs. Reference [8] indicated that despite the frequency of multicultural groups in the workforce, little research evidence exists on the nature of the competencies needed for managing a multicultural workgroup, beyond a list of skills. It is therefore important to assess what constitutes effective competencies for managing a multicultural group workforce.

Although it is widely agreed that multicultural/global competencies are required for business success, however determining which competencies are most important is a highly subjective and complex challenge. For leaders to be successful in multicultural interactions abroad and domestically, they must be globally literate. To be globally literate means "seeing, *thinking, acting, and mobilising in culturally mindful ways. It's the sum of the attitudes, beliefs, knowledge, skills, and behaviours needed for success in today's multicultural, global economy'* [9].

Many authors have attempted to define what is meant by multicultural competencies, [10] described multicultural competencies as a cultural consciousness, openness to a way of thinking and cultural empathy. In contrast [11] and [12] argue the role of effective communication and developing new routes of communication, whereas, [4] and [5] emphasise the importance of tolerance, openness and understanding cultural ambiguity.

Based upon the body of existing literature and the findings from the past study conducted by [3] amongst 124 professionals in Slovakia, a list of 20 key competencies were comprised for effective intercultural management [13]:

- Communicative competency
- Openness towards other ways of thinking
- Language competency
- Social competency
- Culture consciousness (sensitivity, adaptability)
- Ethics
- Ability to manage diversity
- Culture empathy
- Tolerance towards ambiguity
- Flexibility
- Ability to collaborate with and lead individuals
- Honour, truthfulness and integrity
- Managing unpredictable situations
- Professional excellence
- General managerial skills
- Life-long learning
- Resourcefulness
- Self-confidence/independence
- Critical thinking
- Managing stereotypes

If the above competencies are compared with the findings of the study conducted by [5] who used a sample of German expatriates to suggest important intercultural competencies, the 4 competencies of communication skills, empathy, tolerance towards ambiguity and flexibility can be identified as identical to the four most important competencies identified by [3]. As a further comparison the competency list developed by [4], based on a survey of more than 100 global leaders from 16 companies in 36 countries, illustrated the competencies needed for success in international business, two of the competencies, culture sensitivity and flexibility are also identified.

Following analysis of the findings from the existing literature, [3] compiled a concise list of the ten key competencies for effective multicultural management:

- Communicative competency
- Openness of mind (towards other way of thinking)
- Flexibility
- Language competency
- Cultural empathy
- Culture consciousness (sensitivity, adaptability)
- Tolerance towards ambiguity
- Ability to collaborate with and lead individuals (leadership)
- Resourcefulness
- Self-confidence

III. Knowledge Management of Multicultural Competencies

The area of knowledge management defined as 'any process or practice of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organizations' [14], represents a significant challenge and great opportunity for any organisation operating in a competitive globalised marketplace. The challenge for management and the HRM function is to understand clearly the competency of management and implement organisational learning in order to support the development of these firm specific skills.

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Reference [15] elaborated further and stated that the development of multicultural competencies is dependent upon the role of internal firm issues relating to people, processes and structures. Reference [3] has developed a systematic approach to the knowledge management of competencies by integrated the internal firm attributes into a model for the development of intercultural competencies. The aim of doing so was to create a new model to enable enterprises to implement the development of the identified multicultural management competencies, depicted in Figure 1.

The model is based upon integrating six global environment influences; business and industries, the natural environment, economic, political and legal, technology and culture as addressed by [15]. These are combined with inputs comprised of state, organisational and individual factors, subsequently resulting in the development of the intercultural competencies through the increased knowledge, skills and abilities of management. As a result the effective development of multicultural competencies fosters a "multiculturally friendly environment", which leads to significant benefits for the organisation with regards to increase knowledge and innovations, competitiveness, sustainable development and added-value.

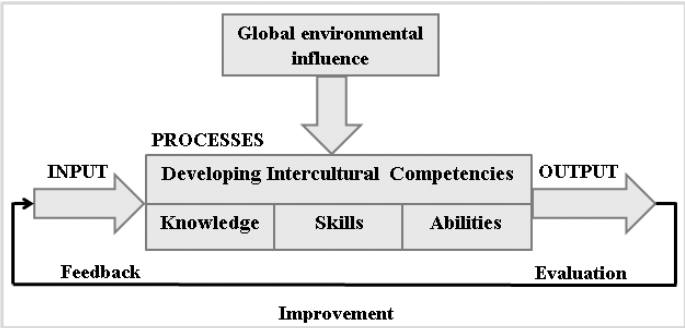

Fig. 1 a model of intercultural competency development

IV. The Impact of National and Corporate Culture upon the Development of Management Competencies

Culture can be applied to both nations and organisations which is why the distinction between national and corporate culture is made, as a result cultural stereotypes can refer to a national with each organisation possessing its own cultural variation [16].

The successful implementation of a multicultural competencies model approach within an enterprise is dependent upon the attitude and aptitude of the managers within the enterprise and their ability to disseminate information throughout the organisation. Therefore the intercultural management style also becomes of critical importance to the implementation and sharing of multicultural knowledge. Furthermore it is necessary to consider the cultural differences of managers and the role within the sharing of multicultural knowledge.

Hofstede's cultural dimensions is the most widely applied model of categorising national cultures based upon the five dimensions of individualism, power distance, masculinity, uncertainty avoidance and long-term orientation [17].

The comparison of Hofstede's cultural dimensions for both Slovakia and the UK is indicated in Table 1. It is evident from the scores that disparities exist between Slovak and UK managers, as Slovakia exhibit a large Power Distance (PDI) score of 104, compared to a very low PDI score of 35 for the UK. Similarly managers in the UK can be expected to adopt a far more individualistic approach, with a higher score of 89, compared to only 52 for Slovak managers. In contrast, Slovakia ranks higher than the UK with regards to Masculinity, scoring 110, compared to 66 (UK) and also Uncertainty Avoidance, scoring 51 (Slovakia) compared to 35 (UK).

Table I Hofstede's cultural dimensions scores for Slovakia and the United Kingdom

Country	Slovakia	United Kingdom
Power Distance	104	35
Individualism	52	89
Masculinity	110	66
Uncertainty Avoidance	51	35
Long-term Orientation	38	25

V. Corporate Culture Within Management Competency Development

Hofstede's study assumed that the corporate culture variable was consistent through all IBM subsidiaries world, thus concluding differences were the result of national culture [17]. However, in contrast numerous other authors have argued the importance of corporate culture and devised a model of corporate culture. Four different types of corporate culture are proposed categorised as power-orientated, people orientated, task-orientated and role-orientated [18], [13]. Reference [18] proposed four definitions of corporate culture types depicted in Table 2.

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Table II Handy's four types of corporate culture

Power-orientation	*The power-orientation is a culture with a central power source that exercises control. There are few rules or procedures and the atmosphere is competitive, power-orientated and political.*
Role-orientation	*The role-orientation is a culture in which work is controlled by procedures and rules and the role, or job description, is more important than the person who fills it. Power is associated with positions, not people.*
People-orientation	*The people-orientation is a culture in which the individual is the central point. The organisation exists only to serve and assist the individuals in it.*
Task-orientation	*The task-orientation is a culture in which the aim is to bring together the right people and let them get on with it. Influence is based more on expert power than on position or personal power. The culture is adaptable and teamwork is important.*

VI. Research Methodology

The research was conducted by means of a structured questionnaire of 124 employees working within industrial enterprises, research institutions and universities in Slovakia. The research was carried out during summer and autumn 2010 and the finding were supported by literature and the authors own experience working in organisations in the UK and Slovakia. A high proportion of respondents were employed in the public sector with 38 employed (30.65 per cent) by universities.

There was a large mix in respondents and there was a wide spread, although the largest number of respondents reported they were at the bottom in terms of job position. 16 respondents (12.90 per cent) reported they were in top management, 33 respondents (26.61 per cent) in middle management, 20 respondents (16.13 per cent) in lower management and 34 respondents (27.42 per cent) reported to be common employees and 21 respondents (16.94 per cent) responded to be other.

In order to determine the significance of Hofstede's dimensions in the context of multicultural workplaces respondents were asked to rate their line manager based upon whether the style of management could be categorised as active, friendly, distant or authoritarian. Results were compiled for both Slovak and foreign line managers and then direct comparisons were drawn between the UK and Slovakia based upon depth interviews.

VII. Research findings

It is evident from the findings of both the questionnaires and depth interviews that significant differences exist regarding the styles of management adopted by Slovak and managers of other nationalities. The findings from the survey question "What management style does your immediate line manager use ", shown in Table 3 below, indicates that 18.2% of Slovak managers adopt an authoritarian approach, compared to only 11.9% of managers from another nationality. Furthermore, the results indicate that Slovak managers typically adopt a more friendly (29.1%) style compared to other nationalities (21.4%) and are less distant (7.3%) compared to other nationalities (16.7%).

Table III classification of management approach by nationality part 1

	No.of respondents	Active	Friendly
Slovakia	55	45.5%	29.1%
Foreign Country	42	50.0%	21.4%

Table IV classification of management approach by nationality part 2

	Distant	Authoritarian
Slovakia	7.3%	18.2%
Foreign Country	16.7%	11.9%

If the traits of Slovak managers are compared with that of UK managers, based upon findings from the depth interviews it is reported that managers in the UK typically adopt a functional goal orientated approach, focusing upon collaborating together to complete the task. This is supported by the responses from several UK employees that their

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immediate manager "checked upon their progress infrequently and it was their responsibility to keep their superior updated regarding progress". This supports the questionnaire findings that Slovak managers typically adopt a more friendly management approach and are less distant with their subordinates than their comparable peers from other nationalities.

If the research findings are assessed in the context of Hofstede's cultural dimensions, it can be concluded that a large number of Slovak respondents classified their manager's style as authoritarian. This directly reflects the extremely high power distance score of 104 underlining that authority is clearly defined in the Slovak workplace and those occupying positions of seniority are highly respected by their subordinates. In contrast the UK scores very low in terms of power distance (35), this can also be reflected by the less authoritarian approach of UK managers, who typically exhibit a preference for delegating responsibility as a means of empowering employees. Therefore although formally layers of responsibility exist within UK enterprises, in practice a more pragmatic and flexible approach is adopted when compared to Slovak enterprises.

The research findings also depict the Slovak management style as based upon friendship with less distant relationships than the approach adopted by foreign managers. This can also be confirmed by the interviews with UK employees who report that management is friendly but typically goal orientated. The findings can be supported by Hofstede's cultural dimension of individualism whereby the UK scores highly (89), in comparison with the Slovakia score of 52. This can be explained by the historically collective nature of Slovak society which today remains a significant factor in defining the approach of Slovak managers. In contrast the more individualistic nature of UK culture places a greater emphasis upon the empowerment of subordinates as a means of personal development and advancement.

If the survey findings are analysed based upon the respondents managerial level, illustrated in Table 4, it is evident that the more senior an employee is in the organisation, the more distant, less friendly and more authoritarian the relationship is with their immediate manager.

Table V classification of management approach by employee level part 1

	No.of respondents	Active	Friendly
Employee and low manager	40	47.5%	30.0%
Middle and top manager	43	46.5%	18.6%
Other	14	50.0%	35.7%

Table VI classification of management approach by employee level part 2

	Distant	Authoritarian
Employee and low manager	10.0%	12.5%
Middle and top manager	14.0%	20.9%
Other	7.1%	7.1%

As a result it can be concluded that alongside national factors playing a significant, it can also be stated that the role of corporate culture and organisational structure determines the style of management.

The findings are further supported by the management approach classification by enterprise type, shown in table 5 below.

Table VII classification of management approach by enterprise type part1

	No.of respondents	Active	Friendly
SME or other	24	45.8%	12.5%
Big Enterprise	43	51.2%	32.6%
University	30	43.3%	26.7%

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Table VIII classification of management approach by enterprise type part 2

	Distant	Authoritarian
SME or other	16.7%	25.0%
Big Enterprise	7.0%	9.3%
University	13.3%	16.7%

The findings indicate that within Small and Medium Enterprises (SME's) the relationship is less friendly than within big enterprise and university environments. This indicates the impact of working in larger teams with greater opportunities to build social relationships. This could be interpreted that a stronger "people orientated" approach exists within larger enterprises, as people are regarded as the greatest resource of an organisation. Furthermore larger enterprises have the necessary time and financial resources to invest in the development of human capital, fostering stronger working relationships than in SMEs. The management styles within SME's is also reported as more authoritarian with 25% of responses compared to 9.3% of responses for the same category in big enterprises. The results can be accounted for by a greater emphasis upon the task-orientated approach within larger organisations whereby due to the larger size and complex structures, management prefer to delegate responsibility and allow subordinates to "get on with the task" [18].

VIII. Conclusions

It is evident from the research that there are significant differences between the management approaches adopted by Slovak managers when compared with those of enterprises in foreign countries and specifically within the UK. Moreover, it is clearly evident that the management styles adopted closely mirror the national cultural characteristics as depicted by Hofstede's dimensions., As a result the UK management style tends to represent goal orientated with fewer personal relationships when compared with Slovak management which places a greater emphasis upon a collectivist approach and building close business relationships. In contrast upon analysis of the management approach by enterprise size and employee level, it is evident that the differences can also be accounted for by structural and corporate cultural factors relating to the organisation. As a result it can be concluded that the managerial style is determine on both a national and corporate level.

Furthermore, it is of crucial importance to take account of managerial approach differences when developing a structure model of knowledge management within an organisation. As a result the model previously developed by [3], can be elaborated upon to place greater emphasis upon national and corporate management traits and attributes, alongside those knowledge, skills and abilities of the individual manager. As Slovak enterprises continue to internationalise and develop increasingly multicultural work environments; it will become an even greater priority to understand the impact of multicultural management styles, therefore placing greater importance upon the practical application of an actionable model of multicultural management competencies.

Following this research additional scope has been identified to further analyse and categorise multicultural management styles. Within the remit of the study the four management styles of "active", "friendly", "distant" and "authoritarian" were assessed to accurately reflect Hofstede's cultural dimensions. However it is necessary to conduct further studies to test the appropriateness of the categorisation to enable conclusions to be drawn of global management styles.

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Accounting in the integrated management information system

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***Abstract*—**Starting from the assumption that the manager of a buissnes organization, makes his buisness decisions wich are based on information that sector accounting delivers, makes the subject of this topic , a informational sistem of accounting, as a main goul of dynamic and effective presentation of true and reliable financial reports.

Accordance to that, in this topic the primary subject is lists and explainations of the role and importance of the module informational systems that supports business processes in accounting and management organization.

The purpose of this accounting informational system is to accumulate the data, ie. information that will assist managers as the main carrier of the success and development of the company, to discover significant opportunities (chances) and problems (menace) in the expression of the goals and the realization of expectations.

***Keywords*—**Integrated information systems, accounting data, accounting information, knowledge, system, systems of intormation, accounting information system, accounting.

I. INTRODUCTION

Accounting is now defined as the security measure of certain information which are known as resourses of making decisions about the allocation of resources by the management company. In the previous period, all documentation were on paper, but now the job is done by accounting software. Since the crediting of associated books, no diaries, or with him, without documentation, or with her, we've reached the time when significant segments of the accounting functions become virtual. Namely, today's companies which are in dynamic and turbulent environment, have the chance ti operate successfully in the grueling race with the competition, only if they have a well developed information systems in which they will operate all present business functions. The purpose of this accounting information system is to accumulate data, ie. information that will help managers to identify significant opportunities (chances) and problems (menace).

II. THE MAIN HYPOTHESIS, EMPIRICAL AND THEORETICAL DANA

The main exploratory hypothesis is corect if;

Hypothesis 1: A well developed information system, is the chances of a successful business in a turbulent and dynamic environment with a extent smaller workload and costs with dynamic and efficient procces rate of information and the business trail. In order to test this hypotheses and to obtain the most precise answer to her answers, in this paper we have used a combination of researched methods. Depending on the needs, there have been used empirical and theoretical research methods. The empirical data used in this study are based on the observation and analysis of the components of the accounting software Sinergis, using companys which are headquarters are in the territory of the Republic of Serbian (Serbian Republic, D.o.o. EuroExpress, Banja Luka, D.o.o. Max Mape, Bijeljina, A.D. Unis, Derventa, HG-Inženjering, Foča and others).

The theoretical data used in this study is based on:

1) Primary sources of facts from the following scientific fields: accounting, auditing, finance, management and information technology,

2) secondary sources of facts which include reference literature (websites, dictionaries, professional journals, legitimate regulations from the field in of accounting, auditing and finance).

Methodological limitations are reflected in the fact that the empirical data is collected through observation and analysis of a single accounting software and one market, which reduces the degree of theirs comparability, especially at the international level. We must keep in mind this while clearly borne in mind in case of proper inference of obatined results.

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III. AN INTEGRATED INFORMATION SYSTEM

In the business systems frequently occur the following business processes: acquisition, production and sales. A model of such business system is shown in the Figure 1;

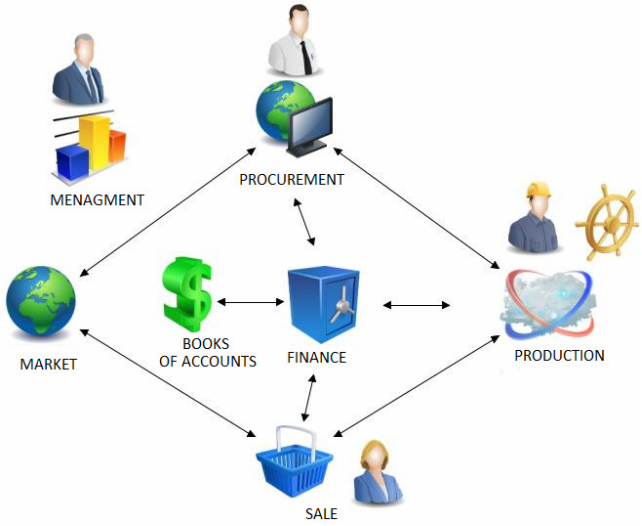

Figure 1 Model of business system

Each process in the business is less dependable than other processes and as such one it makes a business link of business system. The production process is directly dependent on the process of procurement of raw materials used in the production, and it dependens on the finished sales products under the condition of scope planed production. As we have mentioned dynamic operating conditions the need for lots of information in the right place at the right time which today can not be imagined without the support of information systems.

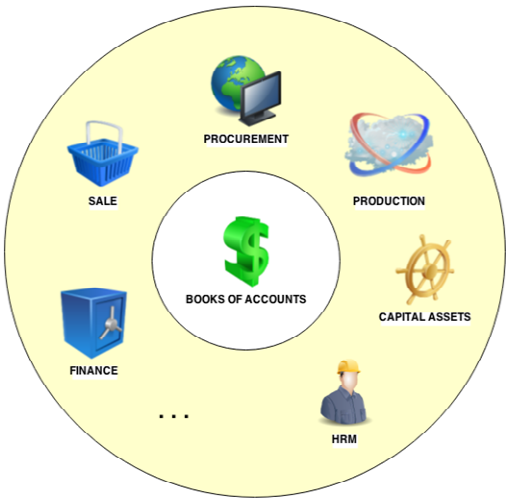

Figure 2 Integrated information system

IV. ACCOUNTING INFORMATION SYSTEM IN A FUNCTION OF THE MANAGMENT ORGANIZATION

Since the information systems is accounting information system, it must have target system. In the narrow sense, it should be clear that the target system must be a business operation. Other non-accounting aspects of business operations are covered by other information systems such as human resources, information systems, management information systems, manufacturing systems, strategic planning system, etc. Main system in accounting information system it must have concection with the accounting aspects of the assets and liabilities of the company, results of operations that result in revenue and the aspects of financial reporting. The information system is different from other types of systems in a way of his purpose to record and document the operation of another system. The second system is the target system. The information system can not exist without the target system. For example, the activities of information systems, human resources and operations conected with them by aim of information system of human resources and so on.In a sense, every reactive system will have a subsystem which can be considered as an information system which aims is to monitor and control such a reactive system. The system is a set of interdependent components (some of which are the system), which correctly can achieve certain purpose.

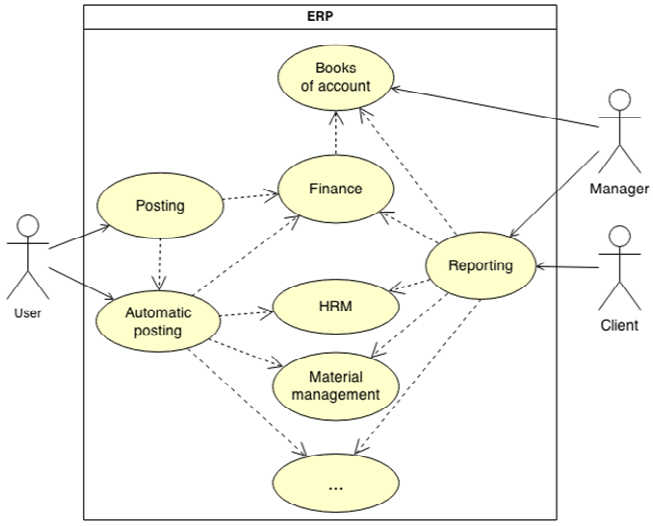

Figure 3 Accounting information system

Accounting information system is a permanent shsre of the daily operations in the company. Each transaction must be characterized in order to make the financial statements or any sort of unofficial reports that management can use for the purpose of business analysis. From this reason the accountants were one of the first people who needed the information system. Today, accounting information system can be simple and at the same time extremely complex. The price of this system can varie from multinational system specially adapted to standard software packages that cost less than $ 100. There are many advantages and disadvantages of both systems. Specially adapted are aligned with the requirements given by business organization and they interact with other internal systems as well as their ability to implement special protection

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measures.

The advantages of standard software are:

1) Good price,
2) Current access,
3) Documented data stream,
4) Good compatibility with external systems,
5) Support manufacturers and sellers;

The disadvantages are:

1) Lack of some special properties,
2) Present surplus properties,
3) Risk that manufacturers will not honor our claims,
4) Training employees;

All business transactions must be recorded in the accounting system. Management accounting information is needed in order to make good business decisions. Since accounting is mandated to mark all business change within one business subject, accounting information system must be connected to all other systems within a given subject. In conjunction with other sub-systems, accounting information system collects and processes data, so that based on them they can perform analysis, control, automatically prepares the financial statements and perform financial planning. The introduction of information technology has the most improved analysis, control and reporting. Specifically, these are the parts of the accounting work that in addition to the precision they must also be timely, which means fast and automatic data processing machines, and that is just twhat them a modern technology gives. A good accounting system allows the user to review the unofficial reports such as accounts receivable or outdated reports on the state of inventory. These systems can be designed to provide informations about the form and in what period of time which responds each individual user. The purpose of implementing the accounting system is to improve efficiency. If the system isn't such as one that saves the time and increases accuracy it should be replaced.

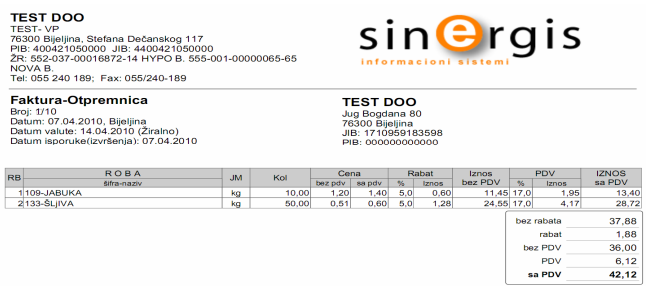
Accounting jobs within the information system can be grouped into (1):

1) Chart of accounts,
2) Processing of financial change,
3) Creation of recapitulation,
4) Posting a recap,
5) Control between the general ledger and analytical records,
6) Various reports;

Accounting systems must monitor transactions in the three following business processes:

1) Order form - input - for sale,
2) Billing - receiving invoices - processing order from the cashier,
3) Shopping - payment (cash and gyro);

Purchase Order - entrance - sales includes sales data and the system recirds this information. This process begins with the receipt of a purchase order from the buyer. Indent often initiates on selling on credit. Once the purchase order is approved by sales department,it must notify the warehouse of goods to prepare for the delivery. And the department for shipping goods on the destination. Invoicing - receiving invoices - processing order from the treasury also receives the same information. Storage sends a good along with dispatch, shipping department shall dispatch the goods and send information about the sales department and unit for invoicing - receiving invoices - processing order from the cashier, and this ends the second cycle of business is processed.



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sinergis informacioni sistemi

Faktura-Otpremnica
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RB	R O B A	JM	Kol	Cena		Rabat		Iznos	PDV		IZNOS
	šifra-naziv			bez pdv	sa pdv	%	Iznos	bez PDV	%	Iznos	sa PDV
1	109-JABUKA	kg	10,00	1,20	1,40	5,0	0,60	11,45	17,0	1,95	13,40
2	133-ŠLJIVA	kg	50,00	0,51	0,60	5,0	1,28	24,55	17,0	4,17	28,72

bez rabata	37,88
rabat	1,88
bez PDV	36,00
PDV	6,12
sa PDV	**42,12**

Figure 4 Invoice example

Invoicing - receiving invoices - processing order from the cashier located in the second phase of the business cycle. At this stage, the invoices must be reviewed and monitoringovani in order to provide regular payments. Invoicing - receiving invoices - processing order from the cashier located in the second phase of the business cycle. At this stage, the invoices must be reviewed and approved in order to provide regular payments. When the department of shipping goods notifys the department for invoicing - receiving invoices - processing order from the cashier, that department must issue and send an invoice to the customer . Customer's credit limit and the time payments are also whatched by the program.

Purchase - payment (cash and gyro) is the last stage in the business process and in the entire process of spending within the company. Requirements for procurement are issued by someone from the department to control inventory and who sends it to the department for purchase. Department for the purchase makes real indent, orders it and sends it to the supplier. Before that, the invoices must be checked which are due for payment. When ordered goods arrive together with the accounts, department notifies shopping warehouse. If you pay by cash a cashier will write you a cash-check and give it to a suppliers, and then attach it to the the receipt with the account of the issue of funding.

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All of the functions above areheld by accounting information system. . Necessary, system connections to record these transactions can be very complex. There are main files from which it must be constantly reviewed the information and there is a wealth of new data that is constantly being introduced into the system and which is updated by main files.When it's all over everything has to be exactly complex so that can give accurate and clear accounting reports.

Accounting information system as the radix of the information system in the management of the enterprise or business, it is possible to modifythe it's needs of enterprise managagment with model accounting information system. Depending on the needs of internal (management, administration, etc.) and external (banks, lenders, suppliers, and others) users which adequate information on which will make business decisions, the company's accounting information system can be conceived so that it's function can be based on one of the most commonly used models: the model of information subsystems financial accounting, information subsystem of the business model (drive) model and model accounting information subsystem of management accounting.

Information subsystem of financial accounting is mandated to collect, process and provide information for internal and external users through financial statements. Therefore, it informs users about the position of the company on a specific date (balance sheet) and profitability (profit and loss) and liquidity (statement of cash flows) of the company. This model is primarily aimed at generating a set of business information for external users, while internal users are almost secondary. External users are primary in relation to the internal as a reason for these financial statements which are intended for accountability (eg, guarantors, lenders, etc..) and the calculations of the tax burden (for example, tax administration, financial by Inspection, etc).

System operation is as follows: After recording the data in the log , automatically they are transferred to the general ledger and systematically divided into synthetic and analytic accounts , and from the general ledger balances which are transferred to the appropriate position of the financial statements . In this way , the user can review at any time the synthetic analytical records so that accounting functions can save time , because uniform data entry , giving them more time to address the issue of internal accounting controls and thereby improve the quality of financial reports . Also, there is no automatic link between the individual financial statements , for example, the financial results are switched from the income statement automatically to the agreeable position in the balance sheet and certain items of the balance sheet, and income in the statement of cash flows , to the activities of the cash flows.

Unlike the previous model, which was primarily focused on providing information to external users, the goal of this model information subsystem business accounting is the collecting, processing and transfer of information intended for internal users of accounting information, such as management, administration and other departments in the company.

The aim is to provide the management of the numerous and complex information to business is decision-making process so that can be effective. For information subsystem business accounting emphasis is placed in the production and creation of new effects,on the aspects of productivity, profitability and efficiency. This is ensured through continuous monitoring on the one hand of the cost, and on the other side of the outputs achieved.

Special records are kept - records that include business journal, general ledger and subsidiary ledgers . The software performs an automatic connection to financial accounting records and transmits data from one record to another and vice versa . For example, an information subsystem business accounting assumes thet the costs of the five classes of financial accounting sorts them in appropriate positions within the drive accounting and year-end accounts of class nine are closed, and the data of changes in inventories of work in progress and finished goods are taken in the financial accounting.

Information subsystem of buisness accounting provides users an overview of the financial results for profit centers and performs allocation to specific cost centers . This distribution provides a cost - allocation system, the possibility of automated calculation of the cost price .

Model information subsystem of managerial accounting is a characteristic mix of the two previous models . Today, the company management is unthinkable without the driver information system . Users are, as the name says, the control system of the business sector .

All information covered by this system can be divided into three areas :

1) Information for strategic planning ,
2) Information for management control ,
3) Information for current operations ;

The software captures both planned and actual values on a daily basis which are updated and analyzed, that means departuring from the plan work. Plans are monitored on a daily, weekly , monthly , quarterly ,semi-annual and annual basis . Another specific feature is that you can enter the coefficients of price changes and exchange of rate which are automatically calculated by all the old and new transactions under the new conditions. This is especially important in how to operate in volatile market conditions , such as ours.

V. CONCLUSION

The development of information technology has come to that level where almost no sphere of life in which their elements are not included. A special contribution is expressed through efficiency, cost-effectiveness, cost-effectiveness,

information technologies are given to all shapes and forms of business. Each business function in all forms of business entities is improved by implementing the appropriate equipment and software applications. One of the most comprehensive quantitative sector, in terms of the extent of manual operation is certainly the accounting sector.

The accounting process involves the collection, processing and presentation of data . All of these activities are now covered by the relevant information with appropriate program packages that automatically carry out registration, transfer , calculation , clustering analysis, control plans, deviations from the plans and the preparation of financial statements. The introduction of this type of work in accounting , has a multiplicity of benefits that occur in the form of reduction in workload, reducing the percentage of errors, increase accuracy of data, better clarity and dynamism. This has raised the whole accounting department at a much higher level and made the job of recording the secondary , and made creative and meaningful part of the accounting a primary one.

Different offers of accounting software packages is growing bigger and bigger and increasingly innovative and more innovative. Every day new developments are expected in these areas of accounting, which will have to be transferred to the data processing technology. This means that the era of information technologies has just begun and we're for much more in this field. What remains is for accounting professionals to adapt to any new technology and to use it to their advantage.

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Multiple Approach to the Term of ´Crisis´

M. Mikušová

***Abstract*—**The paper contributes to consolidating and structuring of relationships in crisis management research. The goal of this paper is to present the review focused on a comparison on different concepts of a crisis by different authors, their approach and extent. Most of the definitions will contain dialectic entities even if they are under different titles. These entities presented in the second part must be understood for further theoretical research as well as practical use. The goal was fulfilled by applying secondary research, in which a qualitative analysis of a wide range of primary, but also secondary sources was executed.

***Keywords*—**Crisis, entity, organization, system.

I. Introduction

THERE are many challenges in each area of scientific study. In the area of the crisis management the challenges are more significant, possibly due to the complex nature of crises and due to the interdisciplinary character of their studies. To facilitate further progress of research and the systematic collection of knowledge it is necessary to integrate the relations between research programs currently in progress. One way how to achieve this is to integrate crisis studies into a global concept that would provide a unification of efforts in their research areas. The core of the orientation concept is based on the relations between various research topics on which the research can be built on. According to Shrivastava it is the notion of "permanently sustainable development" [27].

The notion of crisis can be elevated to the level of the wide and complex macro-term including a whole set of notions. It is a fact that it is necessary to include notions like uncertainty, contingency or ambiguity in the term crisis; it is possible due to the progress of complex knowledge and complex theory [31]. The idea of forming a "crisisology" is possible and its implementation would be beneficial. The crisis discloses and moves in the same time. The crisis discloses what was hidden, latent or potential in the society (organization or individual): basic antagonisms, deep seismic disorders and the hidden development of new realities. Crisis, at the same time facilitates the theoretical study of deeply rooted elements of a society or organization, their abilities to endure or transform. In this sense a crisis is also something like a mover. It moves everything that can bring change or transformation even if it is just in a temporary or preliminary form.

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In recent decades the topic of crisis management has been significantly developed in scientific research. In the theoretical area, crisis management can be successfully developed only as an interdisciplinary science integrating economic, sociological, psychological, political and other scientific disciplines. However, the system approach to the research of this complex and integrated phenomena is a priority. In the opposite case we can reach only one-sided views. The research of crises is interdisciplinary and very varied. There is no unified concept guiding the process. Research results are dispersed and applied ad hoc. All these aspects of crisis deserve much more research attention than before. Economics, management, organization or the general standing after the crisis will never be the same as before it. Organizations need a better description of all types of crises. They need analyses of the reasons and consequences of crisis; they need instructions how to face them and how to manage them.

The preliminarily defined areas of the research are mutually overlapping:

The systemic approach to a crisis, which means understanding the organization as a system, a detailed review of the organization (system) research levels, with inherent crisis preconditions, a review of different meanings of the term "crisis", explanation of the elements and factors related to the term "crisis".

To understand crisis as a term, it is necessary to understand an organization as a system that can go through crises. The author has focused on the system approach in an organization, as a system of complicated mutual relations, energy and physical changes (e.g. raw material transformation), feedback, complex mutual impacts of this feedback, the occurrence of disorders and risks that means conditions for the crisis initiation and development. The word "crisis" is often used in common speech and in the social sciences. A definition of the current crisis of an organization is constantly changing as well as techniques for its structuring.

The goal of this paper is to present the review focused on a comparison of different concepts of a crisis by different authors, their approach and extent. Most of the definitions will contain dialectic entities even if they are under different titles. These entities presented in the second part must be understood for further theoretical research as well as practical use.

This paper contributes to consolidating and structuring of relationships in crisis management research. The goal was fulfilled by applying secondary research, in which a qualitative analysis of a wide range of primary, but also secondary sources was executed.

II. Complexity of crisis

To understand the concept of a crisis in the right way, it is necessary to see the organization as a system that can go through crises. According to Morin [15] the organization - system is viewed from three levels: a systemic, cybernetic and negative entrophic level. Each level creates good conditions for the crisis. It is the content of the first part. The concept of crisis is diverse. The second part is focused on the different characteristics of a crisis.

As every system conception, the concept of crisis is based on the system of interdependent elements. These dialectic elements occur in a majority of definitions even though they are called differently. For a further theoretical search but also for practical utilization, it is necessary to understand these elements. The third part of this paper stresses that the concept of crisis is ambiguous. It also identifies and explaines the elements that are generally found in most crises (disruption, precondition, triggers etc.).

III. Organization as a system and the levels of its exploration

The author based the explanation of this concept on the theory of society. Marx's theory of society combines sociological, economic, anthropological, historical, futurological, and ecological perspectives. Marx sees society as an internally contradictory and dynamic whole in which the basic societal institutions get into conflict with an individual´s life process. This approach can be figuratively applied in view of the crisis and its elements.

If the concept of crisis had been limited to only the economic sector then it would be possible to describe it by some quantification characteristics as e.g. a decrease in production, a decline in consumption, or growth in unemployment. Once the concept spreads to all areas of societal life and to every theory then its explanation is difficult. Application of that term makes it possible to only express that something is wrong. The fact that the crisis penetrates into all areas of societal life offers approaching the crisis from the position of the theory of society that, as such is systematic, cybernetic and negative enthrophic, which is the basic principle of the 'theory of crisis' [15].

Morin in accordance with Marx's societal theory suggests investigating the system that can go through crises from three perspectives - systemic, cybernetic, and non-genthrophic levels [15]. The following outline of the three levels is based on Morin's article [15]:

A. System level

A systemic approach assumes that everything belongs to some type of system. A system as a set of elements in a mutual interaction [35] inevitably has to induce antagonisms. Every mutual relation requires and puts into life the principle of complementarity (completing each other) as well of antagonism (contradiction). To the antagonism of forces the existence of which is assumed to exist in every interrelation, further antagonisms (hidden or revealed, potential or real) produced by the organization will be joined. By performing the integration of parts into the whole by means of complementarities, the system introduces certain limitations, barriers and repressions. These limitations suppress as well as release forces antagonistic to the other parts or to the system.

Hidden antagonism among parts and among parts and the whole is another feature of the system. Complementarity among parts of the system is inseparably connected with antagonisms. These antagonisms remain hidden or they are controlled to a certain extent. They begin to appear when a crisis is coming and if they accumulate they will cause it to break out.

The danger of potential crises: Already in the first level, which is a systemic level, a complexity occurs. Here, this expression does not mean only a complexity of interactions and interrelations. Such complexity can be found in every organization. It means every system, whose internal relationships among parts of the whole and between the whole and parts, are at the same time complementary, competitive (implicitly or apparently) and antagonistic. This is the first level where the crisis can find a breeding ground.

B. Cybernetic level

A feedback that regulates a machine's working or maintains a smooth and stable system's operation is activated by the dissimilarity of a certain part of the whole and it tries to remove that dissimilarity. Such regulation is induced by the antagonistic effect of one or several parts, to one or to several other parts whose dissimilarity has exceeded a certain limit and it acts as a threat to the stability i.e. to the status quo and to the integrity of the system. Feedback restores complementarity among parts. Regulation maintains complementarity by means of partial and local anti-antagonistic measures.

The danger of the potential crises: The cybernetic level is formed by heterogeneous elements, mutual regulative influences (feedbacks) and by the utilization of antagonisms themselves. In organizations (systems) some feedbacks (e.g. economic growth) become a phenomenon that will shape social development. Other feedbacks, however, at many various levels create sources of crises. The cybernetic level means feedbacks that on the basis of an error signal reduce deviations from a normative, correct value and, at the same time, it represents a complex interaction among feedbacks, which creates another ground for the crisis.

C. Negative enthrophic level

Growth of entropy (the rate of disorder, uncertainty and chaos) means the weakening of interrelational energy and messing up the organization, which makes the mobilizing of antagonisms possible and leads to the disintegration and splitting up. Any system even the most static, the strongest and the closest one cannot avoid that disintegration.

The danger of the potential crises: On the third - non-enthropic level, permanent reorganization appears to be a

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central problem. Permanent reorganization is interrelated with permanent disorganization and it both feeds and mortifies disorders in non-enthropic zones to the same extent. Systems can outlast and develop themselves only if the exchange with the surrounding world is put into effect.

D. Conclusion of the part

The aforementioned facts can be summarized by the conclusion that the existence of systems implies antagonisms which contain the potential for their dissolution [15]. On the other hand, it can also be said: Anti-organizational forces are antagonistic towards the organization however they are necessary for it. Antagonism and complementarity are two poles of one complex reality. After breaking a certain limit the antagonism becomes a disorganization element, but even after that it can represent a precondition necessary for the reorganization that brings changes.

The bigger the complexity of systems is the more movable and unreliable the relationship between antagonism and complementarity becomes and thus the more it induces 'crisis phenomena' (Fig. 1).

Fig. 1 Organization as the antagonistic complementary system

A crisis arises from internal and external risks and disorders. In this form the third level appears entailing the complexity that is not only a breeding ground for the crisis itself but it also allows the crisis to gain real dimensions.

IV. Multiple Approach to the Concept of 'Crisis'

The word 'crisis' is very often used in social science and in the common language. It indicates a serious problem or a situation in which damage arises. This too free and easy usage is a source of inaccuracy.

A. Selected approaches to the crisis term

Firstly, it is necessary to explain this term. The expression 'crisis' originates from the Greek word 'krise' [27]. In Greek tragedies were moments of crisis in which it was necessary to accept a decision. Crises represented historical turning points where a human choice might have brought about the essential change for the future. A modern conception of crises according to O´Connor appeared in medical literature [17]. It described a serious health condition with the threat of death in which the organism itself was not able to recover without any external intervention and basic reconstruction, and where the self-healing abilities of the organism were insufficient to get it out of the crisis.

Definition of an organizations' current crisis is constantly changing with the change of the technique how to cope with it. Selbst [3] used a definition of crisis as 'any action or failure in the way of acting that significantly impede the organization in normal functions, in acceptable objectives, viability, survival or it has harmful personal effects on employees, clients or voters. That definition concentrated on the action and its failure.

Shrivastava describes the crisis as a destructive situation characterized by the need for immediate decisions, by large unfavorable impacts and by the reconstruction of the system [27]. According to his opinion, crises are induced by causing events, which are in effect for a long time, which have a wide range of consequences and which cause various kinds of damage. They result in a reconstruction of the affected organizations and social systems. Witte also takes time pressure into consideration [36]. He defines the crisis as a decision-making situation as a consequence of accidents and disasters where the existence of the system is in danger and at the same time, the time for making decisions is limited. Similarly, Seymour and Moor compare crisis situation to the cobra which attacks its prey suddenly with a surprise using a very powerful poison [24].

Pearson and Clair describe the crisis as an 'unlikely event with a large impact that endangers an organization's viability and it is characterized as the ambiguity of events and effectiveness, and it means a decision as well as a conviction that the decision must be made quickly' [18]. Their definition contains the finding that the crisis situation potentially escalates and adversely affects an organization's credibility. It puts a strong emphasis on reversing the crisis and bringing the organization back to the original condition and/or on a minimization of damage.

Snyder et al. understand the crisis as an unusual situation that is disturbing and harms the existing state of operation and the whole organization [29]. An organizational crisis, as long as it is ignored or wrongly managed, will endanger the competitiveness and sustainability of the involved organization. It may influence not only the organization involved, but also its stakeholders.

To be able to judge what the crisis may mean for those who are involved it is necessary to accept the ambiguity typical for the crisis. For example, Quarantelli [20] differentiates crises which are considered intentional (war, civil riots), and events which will appear incidentally (industrial accidents).

Shrivastava developed an approach, which claims that crises were 'disasters of an organization which had caused damage

and social cracks including stakeholders and acting through technological, organizational and social processes' [26]. Arrangement of individual crisis events can therefore be seen as functions of interacting minor events that will then form the main event causing the crisis.

Accidents and disasters caused by both public organizations and entrepreneurial sphere were usually considered as industrial crises. Severe accidents at the workplace harming the environment or injuring employees or the public can be ranked among them. Also damage caused to consumers by poorly designed or dangerous products belong here [25].

According to Miller crises can be defined more generally - as serious financial obstacles, psychological suffering and harm to the environment that may occur as a result of an organization's activities [13]. Unifying the definitions was also confirmed by Gregory who saw 'high severity, a low probability of origin, risks and uncertainty as characteristics of the crisis [8]. A crisis arises under time pressure, it devastates a normal operation and it is potentially fatal for the reputation of the organization´.

Billing et al. suggest perceiving the situation as a crisis in dependency on a) a perceived range of possible loss when a difference between the current and required state is being created, b) a perceived probability of loss, and c) a perceived time pressure on the acceptance of a corrective remedy [2].

Meyers and Holusha classified the crisis within four factors: dimension, control, time, and alternatives of decision-making [11]. The first task is to identify the dimensions of the crisis, and the ability and opportunity of controlling it. Dimension meant the degree in which the organization was exposed to the crisis. In case of large exposure (risk) and small control the organization will have to make much effort to cope with the crisis. In a similar way they researched the relations between the factors of time and actions. The most serious crises fell into the critical zone based on both of these factors. Meyers and Holusha felt that such an approach could help managers recognize the areas of a potential crisis [11]. To do so, it is necessary to perform a crisis audit. It consists of two parts. It means first to examine the sensitivity or to assess the vulnerability of the organization if an unexpected change occurs. Management should make out a list of vulnerability and decide on priorities. In the following audit of suitability it is necessary to find answers to three questions: Can the organization detect the impending crisis in its early phase? How well is the organization able to manage the crisis if it has already occurred? Could the crisis bring some benefits?

Dyson considers the crisis 'clearly a matter of perception [4]. An industrial crisis has various shapes in the sense that a partial crisis probably consists of a set of interwoven crises...' Gottschalk assigns an important role to media when he considers the crisis as a significant interruption of an organization's activity attracting media attention [7]. The resulting attention of the public influences a normal operation of the organization which is also under the influence of political, legal, financial and governmental impact. Also Berge emphasizes the role of media and provides organizations with instructions on how they should improve their communication for the period of the crisis and after the crisis [1].

Bell does not see the crisis as absolutely negative [21]. He says that the nature of a crisis in the given relationship is that the conflicts inside the relationship will grow to such an extent that there is a threat of the change in the relationship itself. This definition narrows the vision of the crisis only to the conditions of relationships.

Mitrofft and Pauchant offer a wider view [14]. They define the crisis as a disturbance physically influencing the system as a whole and threatening its basic preconditions, subjective sense and the existential core. This definition, however, ignores individuals, groups and their perception of the crisis. What might be recognized as a crisis by the organization's management cannot be considered a crisis in the definition by Pauchant and Mitroff.

A much more realistic definition is 'a situation which is faced by the individual, group or organization and which they are not able to solve by applying ordinary procedures and in which a stress arises due to a sudden change' [3]. This definition does not suppose any negative approach. Managers often perceive stress as a positive force.

Zuzák narrows the concept of crisis to the organization and he understands it as a situation of various time length in which it is decided whether the organization will return to the situation in which it was before the crisis because the achievement of business goals or its further existence is prospectively threatened [37]. He then modifies his definition of the crisis as an imbalance between the organization and its surroundings or a dysfunction among internal systems of the organization threatening the achievement of business goals or even further existence of the organization. Imbalance and dysfunction are a consequence of the appearance of risk events.

Also Frýbert [6] in his conception of the crisis focused only on the economic crisis understands the crisis as a result of internal and external risk factor interactions on one hand, and incorrect or inadequate reactions of an organization's leadership and its owners on the other hand. Umlaufová and Pfeifer also narrowly focused their investigation exclusively on the business crisis that they saw as a situation in which on one hand a balance between an organization's business characteristics was significantly disturbed (by the mission, philosophy, values, goals and style) and by the attitude of the business environment to the organization (claims, possibilities) on the other one [34]. The further prosperity of the organization then calls for essential action in order to regain a balance.

The author agrees with Fink's definition [5] which she expands from business entities to organizations in general: she defines the crisis as a large deviation from the normal state which disrupts the upward line of not only business activities (in a business entity) but also activities of the organization in general (in non-business entities), challenging the nature of the

organization, threatened by a further escalation, attracting the attention of the public and media, and creating a negative image of the organization.

B. Conclusion of the part

At the end of the 20th century, crises became a very frequent threat. They did not appear where they had appeared before. Many of them were caused by people due to their wrong decisions, by technological difficulties, external impacts or very often by their interrelation. Most definitions see the crisis as inevitably negative while the crises may be also seen as a turning point or the opportunity for some stakeholders, and as such it might be seen also in a positive light. A crisis will often open new possibilities and it can bring free innovatory ideas.

Taken into consideration the diversity of the concept of crisis by various authors it is possible to determine the basic features of the definition that can be accepted in most areas: crises are situations of disruption requiring urgent decisions and actions leading to the later rebuilding of the affected system.

In this paper crisis is understood as a hardly improbable event with considerable consequences. It is perceived by interested groups as threatening the viability of the organization and is subjectively perceived by individuals, and it threatens them personally and socially. The causes of the emergence, effects, and means of a crisis solution lead to a destruction of the integrity of views, values and customary assumptions. In the course of the crisis, decision-making is under the pressure of a lack of time and incomplete information. It means:

- a serious threat for the survival of the whole system,
- time pressure on negotiations,
- complex, ill-structured situations.

V. The Entities of the Term of Crisis

Similarly as all system conceptions, the concept of a crisis is based on the system of mutually dependent elements. These entities in spite of being named appear differently in most previous definitions of the crisis.

A. System

The author draws on the work of Norbert Wiener who sees the system as a set of elements in mutual interaction [35].

It is cybernetics that deals with the general principles of management and transmission of information in machines, living organisms, and communities. The most important principles of cybernetics applied in the study of crises are as follows:

Feedback: The principle of feedback was known already as a regulating technique and was used in the design of a feedback amplifier for the purpose of communication engineering. The founders of cybernetics, however, recognized that a very general principle was in question. Thanks to cybernetics that principle became known in general and it allowed explaining a number of events taking place in various dynamic systems.

Information: The exact theory gradually came into existence as a scion of the theory of probability. Information completed a physical picture of the world in the sense that it is an equally important entity such as mass or energy.

Model: The systematic study of various systems led to the knowledge that systems of a various physical nature might have very similar behavior and that the behavior of one system could be searched through another one easier implemented system in a completely different time or spatial scales. In this publication a simplified description of the system is considered as a model of the system which accumulates important properties of the system. It is desirable that the model also allows a prediction of system behavior in yet unverified conditions.

B. Preconditions for a crisis

Preconditions for a crisis can be developed by the accumulation of the sequence of events whose early identification relates to acceptable assumptions of risk and standards in order to avoid it. Reason, called such events 'hidden pathogens' connected with 'asymptomatic' (latent) failure' that can emerge in organizations [22]. Interesting failures are intellectual (rational) ones built on a management's assumptions which can contribute to the development of preconditions for the crisis (e.g. 'our employees are so devoted to us that we can absolutely trust them'). Turner and Pidgeon mark the evolution of events in the course of the emergence of a crisis situation as an 'incubation period' [33].

Turner and Pidgeon identified factors that would initiate the evolution of preconditions for the crisis [33]:

- Rigidity in thinking and conviction of the top management (the conviction of the organization); this failure of management may influence also the theory of group thinking.
- A problem is perceived, the organization is dealing with it, but separately without looking for connections with other problems that may possibly cause other further disasters.
- The organization does not recognize 'voices from outside' that warn it about potential crisis danger. People from outside may have to deal with rejection or with arrogant responses. Simply because the organization automatically believes they 'know better' the problem than people outside the organization.
- Another ordinary factor is the problem with the transmission of information. In risk situations the nature of information flows is changing. Communication does not work if there are not any sources or if the crisis situation is so serious that necessary information cannot be processed in the existing information network [30].

Inexperienced and ill-informed people finding themselves in potentially risk situations are also a factor contributing to many crises [10]. In some cases the existing regulations (crisis plans and the like) are not satisfactory, which further contributes to the probability of a crisis arising. The inability or unwillingness to see the imminent risk or to assess the size

of sudden danger is a common factor [22]. Possible risks are usually underestimated [20]. Turner calls those factors 'crisis of neglect' [33].

Shrivastava divides the preconditions for the crisis: emerged in the nominal state and later latent - a hidden failure arisen during the incubation period as the internal failure of the organization in connection with the external limitations (regulators), by the infrastructural failure and by failure in the period of preparation for the crisis [27]. Smith characterized the preconditions as the 'crisis of management' [28]. Smith's argument is that the crisis has its roots in the management style that overstates the effect of relatively less important hidden flaws allowing them to combine and thus to trigger the crisis.

C. Disruption

This element has two sides. On one hand, it points to a certain event, external disruption that provokes a crisis (floods, a military conflict, poor crops, etc.). On the other hand, there are special disruptions that do not cause crises but they emerge at the surface from apparently undisrupted processes. Those processes will often appear in the form of being too big or fast growth of a certain value or the variable in relation to other variables (e.g. an excessive increase in supply in relation to demand) [32].

If those processes are considered on the systemic level, it is apparent that quantitative growth creates an overload phenomenon; the system loses its ability to solve problems with which it has dealt before exceeding certain limits. The system should be able to transform itself but it is not able to [15]. More generally speaking, the emergency breakdown can be thought as a consequence of overloading; the system is confronted with the problem which it is not able to solve within its rules and standards of operation and within the limits of its normal existence. A crisis therefore appears as the absence of solution (the effect of deregulation and disorganization) that can encourage the solution (a new regulation, evolutionary transformation) [15].

According to the author more important for the concept of crisis might be internal disruption caused by the processes that seem not to be divisive. This internal disruption caused by the overload shows itself as a failure of regulation or as deregulation. There is a crisis at the level of the organizational rules of the system; it means not only at the level of external events into which the system is firmly settled but also in the organization itself, in its creative and recovering function. Deregulation of the organization will bring malfunction where there was functionality, a turning point where there was the continuity and a conflict where there was consensus.

D. Triggers

This tendency (predisposition) Turner and Pidgeon call a 'precipitating event' [33]. Shrivastava uses the term a 'triggering event' [26], and it represents a hidden (latent) failure originating in the 'incubation period'. Triggering events can be identified by the place, time, and the source of their occurrence.

E. Growth of disorders and uncertainties

Every system of living organisms and mainly every social system entail a disorder. Systems operate despite the disorder which means that the disorder is partly stopped, corrected, transformed and integrated.

A crisis, however, always means a decrease of stability in the system. That is why the crisis always means a growth of disorder, instability and risk. This leads to the growth of uncertainties and to the decline of predictability. Of course, a new, more general prognosis is possible under certain circumstances.

F. Immobilization and release

The influx of disorders is connected with a paralysis which created flexibility of the system, and its mechanisms of reaction. On one hand, there is a collapse i.e. a disorder of the basic structural elements and on the other one there is stiffness i.e. a return to mechanistic forms. The aspect of stiffness reflects in the immobilization of that what really ensured the permanent reorganization of the system by blocking the mechanisms of feedback that removed deviations and faults.

Immobilization of mechanisms of permanent reorganization facilitates potential forces release [16]. Immobilization of the organization actually means a removal of all restrictions applicable to the parts of system and processes taking place there.

The central characteristic of the crisis is then not only the onset of disorders and uncertainty but above all the immobilization affecting the process of organization and reorganization, which is expansion and deregulation. 'Release' of the crisis is reflected in various aspects which are mutually inseparable [15]:

- Development of feedbacks

Crisis disruptions set forces into motion. They increase the existing fluctuations instead of moderating them. Deviations are becoming continuously more pronounced and they are growing instead of being removed. Creation of this feedback reflects in the excessive or inadequate growth or in the decline of a certain element [9]. From that point of view the time of a crisis is the time of the accelerating, increasing, spreading of infection and morphogenesis (the creation and development of new forms having their origin in deviations).

- Conversion of complementarity into antagonism

Hidden (latent) antagonisms in those processes have a tendency to appear while the manifested complementary elements have a tendency to be transformed into a potential form.

- Formation and growth of conflicts

Hidden antagonistic features anchored in every organization clearly appear on the surface. The conflict character has a tendency to fully grow at the moment at which it becomes dominant. Conflicts are multiplied not only on the level of individuals or groups but also within control and regulatory mechanisms on one hand and the processes of deviation and the creation of new tendencies on the other. It is obvious that the term of crisis cannot be limited to the term of internal

conflict within the system but that it implies the possibility of inducing, multiplying and deepening a conflict.

G. Measures

Crisis puts disruptive processes into motion, and are usually very spontaneous. In those conditions the measures based on prognoses and on the deterministic approach seem to be muted. On the other hand it is important to state that the stimulation of measures takes place.

A crisis creates new conditions for negotiations and measures. Due to its uncertain and random nature, due to the mobility of forces and forms entailed and due to the multiplicity of alternatives the crisis situation creates a favorable situation for making bold innovative strategies. It provides room for decision-making among various ways of behavior and strategies. This element is developed wider in the part of this work dealing with crisis management training.

H. Change: progressive and regressive solutions

A crisis offers the possibility of return to the original state (by absorbing a disruption), the possibility of system disintegration (division), and the possibility of total disintegration (e.g. genocide of nation, liquidation of the organization), but it mainly means variants of development and changes.

The uncertain nature of the crisis causes that also its solution is uncertain. As a crisis brings sudden and fast spread of disintegration and integration forces (forces of extinction and recovery) it puts into effect certain 'sound processes' (research, strategy creation, innovations) and also pathological processes (myths, magic, rituals), and it can have both regressive and progressive solutions [15].

Here, the double face of the crisis can be seen more clearly: danger and the opportunity; the danger of regressive development and an opportunity towards progressive development. A crisis activates disorganization and reorganization (while one inevitably causes the other), and every increased disorganization entails factual danger of extinction but it also brings the opportunity to set up a new organization in order to overcome the old and create something new.

I. Recovery, reconstruction

After the immediate shock, the organization tries to manage the impact of a crisis, so that the damage is limited. This is the first step towards recovery. Turner and Pidgeon [12] label it as 'the first stage of settlement'; the immediate after-collapse situation is identified, ad hoc actions are taken and the rescue is started. Smith speaks about the end of the operational crisis in connection with the creation of a 'supportive environment', but according to his opinion the prospects of recovery are not optimistic [28].

Smith considers as the crisis of credibility and legitimacy the situation in which organizations look for scapegoats and blame them to justify their behavior and the management style before the crisis [12]. Their behavior is often justified by the effort to restore external confidence in the organization.

Victims may be offered compensation and they may again join an organization's social system. There is a chance to normalize relationships with employees and other stakeholders. An organization and its processes can be reorganized, demands for compensation can be met, new products can be introduced as well as a new production program, markets can be changed, and new financial management can be introduced, etc.

What Shrivastava [25] and especially Smith [28] point out to is 'a simple cycle of learning'. Errors are corrected but are not the essential policy.

J. Knowledge (learning)

By the investigation of the crisis itself or some other form of the crisis, an organization's attitude to the surroundings changes and it brings a shift from presumptions to the standards of prevention. This is called Kolb's cycle of learning based on experience. A crisis represents the actual experience from which organizations can draw comments and responses to an organization's behavior and its performance by searching and evaluation [38]. The investigation provides a prerequisite that the future behavior will be based on the new concepts (standards of prevention).

This is also a concept supported by Pearson and Mitroff with their contribution of an 'appropriate reaction' and 'critical examination' based on the experience from the crisis [19]. What both authors suggest is the need of inducing a power of learning 'double cycle' which includes questions and changing assumptions, standards and behavior. Such learning also depends on unlearning, which can be a struggle for managers who do not want to admit that they have to change.

VI. Conclusion

From the institutional point of view the crisis is everything that threatens the stability of an organization. However, all crises have several common characteristics (Fig. 2):

A crisis is almost always disruptive. As long as it is not solved it blocks an organization's activity.

The important role of crisis management is to find out how much negative the impact of the crisis on the organization might be, so that it could be possible to ensure a balance between managing the crisis and maintaining the normal operation of the organization.

Crises are almost always negative. They detract attention from important everyday tasks and undermine concentration on work and its objectives, and they create a tense atmosphere between ordinary employees and executives. They cast a shadow of doubt on an organization's credibility in the public image.

A crisis divides the organization. Both employees and executives choose a side which they will join on the basis of facts or their interests and/or organization's interests. Management should recognize the signs of polarization in time and take action to maintain an organization's consistency.

A crisis can cause distorted or inaccurate perceptions. It can show only one side of the whole situation and encourage negative public feelings against an organization. Impression can be very often taken as a fact. Therefore, management has to be ready to deal forcefully with misguided opinions.

With the exception of situations in which the organization anticipated certain risks, the crisis is usually a surprise. Even a prudent manager does not always have to be able to predict the crisis but he/she has to be familiar with the elements that create it, and to plan how to deal with it when it occurs.

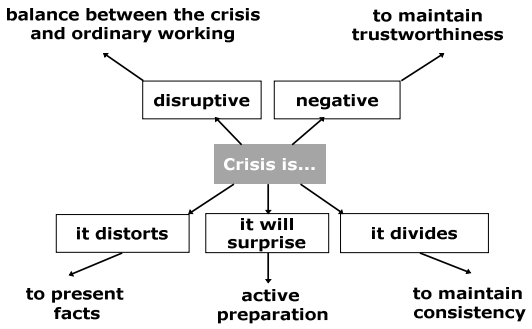

Fig. 2 Crisis is …

In the previous text some entities of the crisis are presented. It is obvious that the crisis is not only a summary of those entities but it is created by their interaction, their combinations, and interrelations of entities and phenomena that are at the same time complementary, antagonistic and operate dialectically. A crisis is both incapacitating and releasing power. It is a system of feedbacks, antagonisms and compliance, practical and magic seeking and finding solutions at the real and mythic level.

The concept of crisis is thus very extensive, more comprehensive than the concepts of failure, problem and disorder. A crisis entails failures, disorders, problems, deviations and antagonisms. This concept encompasses the origin of forces and destruction which is more evident here than anywhere else [15]. In the course of a crisis, quasi-neurotic processes (magic, ritual, mythological) as well as inventive and creative processes are simultaneously encouraged. All those processes entangle, enmesh and fight with each other. Development as a result of the crisis is circumstantial not only because of the spreading disorder but also because all those forces, processes and extraordinary powerful phenomena influence and destroy each other within that disorder.

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The Application of Qualitative Method in Developing a Cyber Terrorism Framework

Zahri Yunos and Rabiah Ahmad

Abstract **-** A qualitative method research has become an increasingly popular approach in the discipline of social science. The purpose of this paper is to describe the application of qualitative method in developing a cyber terrorism framework. The primary goal of this research is to discover the theory and then develop a conceptual framework that describes the phenomena. In this research, a semi-structured interview with purposive sampling procedures for data collection was used. The analysis indicated that the framework describing cyber terrorism can be considered from six different components: motivation, target, method of attack, domain, action by perpetrator and impact.

Keywords **-** Cyber Terrorism, Methodology, Qualitative Method

I. INTRODUCTION

Methodology can be simplified as a plan of action where the method used brings to the desired outcome. The context of methodology as described by Crotty [1] which was cited by Levy [2], defines methodology as "the strategy, plan of action, process or design lying behind the choice of particular methods and linking the choice and use of methods to the desired outcome". It is a researcher's task to examine and make a decision about which research approach, or combination of approaches should be used in a specific study [3]. The objective of this paper is to describe the application of qualitative method in developing a cyber terrorism framework. The purpose of this paper is to discover a theory and then develop a conceptual framework that describes the phenomena by using qualitative method.

II. LITERATURE REVIEW

A. Cyber Terrorism

In this digital age, there is the emergence of the use of cyberspace to carry out terrorist activities [4][5]. As mentioned by Denning [6], the convergence of physical terrorism and the new advancement of ICT have spawned a new term called cyber terrorism. It can be summarized that cyber terrorism is the perpetration of attack through cyberspace and the virtual world. There is no universally accepted definition of cyber terrorism and it seems to be a fundamental issue and challenge in countering cyber terrorism threats [7][8][9].

The concept of cyber terrorism has several attributes (or components) such as motivation, impact and target [10] [11]. At the international front and also among the researchers, there is no common agreement on the concept of cyber terrorism. While there are many definitions of cyber terrorism [12] [13] [14] [15] [16], there is a suggestion that a trend of in-depth analysis regarding this concept can be conducted. It is also evident that the study of this concept has been the focus of many policy makers and scholarly studies, but their standpoints and views on the matter vary from each other. Due to the multidimensional structure (or components) of cyber terrorism, we can say that the concept of cyber terrorism is a contested concept whereby various parties interpret it differently [17][18]. Schmid [19] argues that, "there is no agreement among experts and there is not likely to be an agreement as long they cannot even agree on a common definition on terrorism [and cyber terrorism]."

B. Qualitative Method Research

There are considerable literatures that discuss qualitative research methodologies [20]. Generally, the qualitative research can be explained from the following perspectives.

Firstly, qualitative research aims to achieve an in-depth understanding of a situation or a certain phenomenon [21]. The focus of the research is to explore (understand and interpret) a situation or a certain phenomenon. Qualitative research is labelled as interpretive research because it seeks to develop understanding through detailed description for theory building. Secondly, since qualitative research is interpretive, such research allows the discovery of new ideas and unanticipated occurrences [22]. During analysis, the qualitative researcher uses content analysis of written or recorded materials drawn from participants' expression and observation [21] or document review [2].

Thirdly, qualitative research is often related to small-scale studies. Qualitative data is usually collected through interviews, focus groups and participant's observation. Fourthly, in qualitative research, researcher may serve as a participant, whereby the researcher may observe and provide insights during the process [21].

III. RESEARCH FRAMEWORK OF THIS RESEARCH

This research is about exploring cyber terrorism phenomenon which focuses on the attributes or components of cyber terrorism. A qualitative research is proposed since the project is exploratory in nature,. The research is in-depth in nature where interview-based technique is used. In this study,

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the qualitative method is conducted with the objectives to investigate the phenomena under study, to identify and construct attributes of the phenomena as well as to develop the empirical model that describes the phenomena.

The authors believe that a qualitative method approach is appropriate to be used in this study in order to accomplish theory discovery within a single research project. Theory discovery is achieved by using qualitative data to sharpen our theoretical ideas about the phenomena under investigation. Qualitative methods allow the researcher to record and understand people in their own terms, whereby depth and detail emerge through direct quotation and careful description. The framework of research methodology is described below (Figure 1).

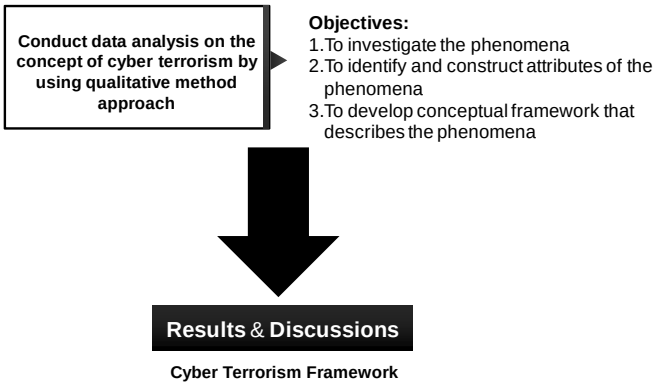

Figure 1. The framework of research methodology

IV. INTERVIEW QUESTIONS

Qualitative method involves interviewing a sample population about a topic, transcribing interviews, coding parts of the transcripts, and relating these codes to one another [23]. In this research, the interview technique starts with a few specific questions and then follows the individual's tangents of thought with interview probes. Interview questions were given to the respondents with minimal guidance, to allow the respondents to have some background on the phenomena being studied. According to Walsham [24], an interview should be supplemented by other forms of field data in an interpretative study, and these may include press, media and other publications relevant to the context of the study.

In this research, the questions are divided into 2 parts: broad and specific. The broad questions in the questionnaire are used for generic issues surrounding the area of cyber terrorism and the second part is to explore the important components of cyber terrorism framework. The research questions are addressed in a developmental manner and rely on the discussions of the literature to help frame and refine the specific topic. The objectives of the initial questions are to probe and provide some insight on the issues under investigation. The questions are linked to the problem and significant to the issue of interest. The questions are theoretical, which provide a number of different samples, and specific questions, which focus on a particular issue of interest. Table 1 presents samples of the interview questions.

Q1.	What are the factors that make up the components (or elements) of cyber terrorism?
Q2.	What are the factors that should not be considered as component (or element) of cyber terrorism?
Q3.	From the various literatures, a conceptual framework describing the core components of cyber terrorism can be described as follows (but not limited to): Target, Motivation, Tools of Attack, Domain, Method of Action and Impact. What is your view?
Q4.	The components of cyber terrorism are bound or linked to each other to form the concept of cyber terrorism. We need to combine the components with the conjunction "AND", which means that, each of those components is necessary to constitute cyber terrorism. If one or more components are not provided, the statement would not constitute cyber terrorism. What do you think?

Table 1. Sample of the interview questions

V. DATA COLLECTION

A study conducted by Bryman [25] indicated that semi-structured interview tends to predominate for qualitative research. In this research, a semi-structured interview method is adapted for data collection. Although a single method of data collection is adapted in this research, the researchers always return to the interviewees for clarification and elaboration. Besides that, related documents were compared with data collected during the initiation of the research.

During the interview, a general interview guide approach was used. As noted by Valenzuela and Shrivastava [26], the guide approach is intended to ensure that the same general areas of information are collected from each interviewee; thus provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting the information from the interviewee. For conversational approach, the interviewer goes with the flow during the interview session, in which no predetermined questions are asked.

Srnka and Koeszegi [27] note that, qualitative research has been characterized by the use of small samples, often between six (6) to thirty (30) respondents. Komives et al. [28] studied leadership identity among thirteen (13) respondents by using grounded theory method. Knight et al. [29] used ground theory to analyze people's views toward different types of animal use such as factors relating to the species animal and types of animal used, which might influence people's views on this subject. Seventeen (17) respondents took part in the interview session. Heath and Cowley [30] studied the professional development of nurses through learning in practice. Interviews were conducted with fourteen (14) respondents who worked in a variety of hospital adult settings. In this research, a total of twenty two (22) respondents participated during the face-to-face interview, and this reflects such a medium size sample, which could be handled with reasonable efforts in term of time and personnel.

The research participants were identified by their working organisations. Overall, there are about 200 Critical National Information Infrastructure (CNII) organisations in Malaysia and 22 respondents' represents 10% of the total population.

The participants consist of both male and female. In order to cover a wide area of population, some key personnel from the academia and private sectors who are recognised as expert in the field of cyber security were chosen to participate in the interview session (therefore represent similarities in terms of their working experience with respondents who are working in the CNII organisations).

VI. DATA ANALYSIS

Data analysis that involves a grounded theory method was used in this research. Data analysis in grounded theory is defined as the process of systematically searching and arranging the interview transcripts, field notes and other materials with the objectives to increase understanding and to enable researcher to present what have been discovered [31][32]. Dey [33] cited by Egan [31] explains that, this method involves creating and integrating categories and their properties, as well as defining and writing the emerging theory. A central approach to data reduction and data display is the process of coding [32], while conclusion drawing/verification is the process of concluding the research [31].

The process of naming or labelling things, categories and properties is known as coding. Coding is a process of identifying and naming significant chunks of text [23] and grounded theory uses several coding techniques to examine the data collected. Charmaz [34] describes that, coding is the first step of data analysis, as it helps to move away from particular statements to a more abstract interpretation of the data collected [35]. Coding involves refining the data into categories namely: open coding, axial coding and selective coding [32]. Esteves et al. [36] explains that the main procedure in grounded theory are open, axial and selective coding. Similarly, Partington [37] and O'Flaherty and Whalley [32] describe data analysis into open coding, axial coding, and selective coding.

The main steps of grounded theory used in this research are as follows: 1) Labelling the emergent concept 2) Grouping the node (or concept) into category and 3) Identifying relationships between categories. For step 1 and 2, it is classified as open coding while step 3 is axial coding.

The researchers analyzed the transcripts by following the coding procedure: open coding and axial coding. Hoda, Noble and Marshall [38] described that, open coding is the first step of analysis and starts by collating key points from the raw data. Open coding is part of the analysis concerned with identifying, naming, categorizing and describing phenomena found in the raw data, which allows the concept to emerge and group together [39]. In this process, the researchers need to label the transcripts step by step. Method of constant analysis was employed to analyze the transcripts [29]. The researchers quote the original text, label the text, and conceptualize the coding content. Each concept (or node) is created every time the theme begins to emerge. As the researchers identify the text that is related to a specific theme, the text is selected and coded. Esteves et al [36] described that, open coding is about labelling concepts that represent discrete happenings and other instances of the phenomena.

VII. RESULTS

The findings indicated that the nature of cyber terrorism should have been formulated from six different perspectives: motivation, target, method of attack, domain, action by perpetrator, and impact [40][41]. Motivation is about influencing human beings and the decisions they make. Motivation is forces behind cyber terrorism such as social, political, ideological and economic forces. With the growing interconnectedness of critical infrastructures in ICT, the selection of a target that allows the maximum level of disruption would significantly influence the perpetrator. The perpetrator can exploit vulnerabilities over a targeted system through a vast array of intrusive tools and techniques. The method of attack could be done through network warfare and psychological operation. Cyberspace is the domain in which a terrorist-type attack is conducted. The perpetrator employs unlawful use of force or unlawful attacks to conduct the premeditated attack. The impact or consequence is high as the cyber attacks that are done to intimidate or coerce a government or people lead to violence against persons or properties.

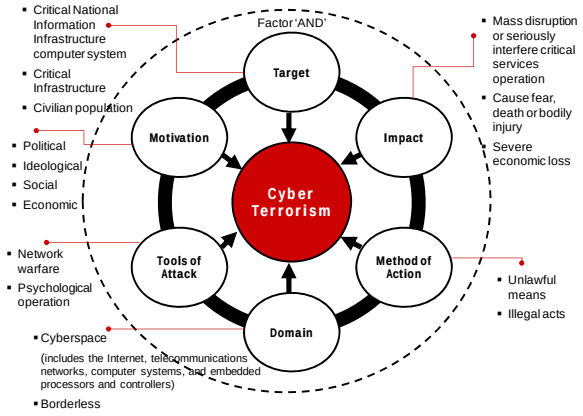

Figure 2. Cyber Terrorism Conceptual Framework

The illustration of the core components of cyber terrorism is described in Figure 2. In other words, the framework suggests that all attributes (or components) contributed in the decision-making process in order to determine whether someone is involved in cyber terrorism or not. The authors suggest that the six components of cyber terrorism in this framework are bound together to form the concept of cyber terrorism. We need to combine the components with conjunction "AND", which means that each of those components is necessary to constitute cyber terrorism. Otherwise, if one or more components are not provided, it would not constitute cyber terrorism.

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VIII. CONCLUSION

The study on the context of cyber terrorism is quite complex as it is about threat perception which makes the concept differs from one to another. Understanding the similarities and differences in the perception of what constitutes cyber terrorism can provide insight on the concept of cyber terrorism. This paper explains on how this research is conducted and describes the framework of research methodology. This paper also establishes the conceptual framework that guides data collection and data analysis techniques. The outcome of this study serves as the basis for various strategic decisions for policy and decision makers as well as useful foundation for academic research in understanding the context of cyber terrorism. A detailed focus analysis can be conducted to investigate and analyze the context of cyber terrorism.

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Efficient Management Methods of Production and Product Projects Transfer

Florina-Cristina Filip

***Abstract*—**The present paper describes the transfer of products, product series and the associated production resources across plants and locations, as well as the reorganization of plants. Due to the complexity and scope of production transfers, these are planned with the aid of project management. In the case of production transfers, planning of manufacturing locations creates an appropriate project organization depending on the tasks involved. The composition of the core team and expanded team will vary according to the scope of transfer projects. The project team is generally composed of employees from the same departments in the delivering and receiving plant and is supported by central functions. The general product coordinator selects the team and defines the sub-projects which are not relevant based on organizational aspects and with regard to content. Transfers in the sense of production transfers are carried out by means of project management in accordance with the gateway principle. Transfers extending over a longer period can be divided into several transfer stages. In the case of transfers, an audit is to be planned at the delivering plant prior to moving machinery and at the receiving plant once the move is complete.

***Keywords*—**machine, manufacturing, production, transfer.

I. Introduction

In the past decades, competition has intensified and customers are more demanding than ever before [1]. The automotive industry is notoriously exposed to the risk of low capacity utilization, and a variety of measures have been taken to improve flexibility [1, 2]. The recent change in Renault's manufacturing strategy demonstrates the new paradigm, away from inflexible one-plant/one-vehicle policies towards highly flexible machines and manufacturing platforms that are capable of producing multiple products [1, 3].

Companies feel ever-increasing pressure to get new products to market faster. As new products are developed, successful new product transfer from research and development to manufacturing is a common problem for companies of all sizes. The best internal transfer process integrates all departments at the same time into the process yielding a gap-free transfer, builds on solid tools and techniques that streamline execution and produce effective results, and is developed and implemented such that the whole company embraces the transfer process [4].

The basis for economic success in the world today is knowledge. The challenge for any nation seeking economic success can therefore be thought of as twofold: first, to facilitate the acquisition of knowledge from within (or without) its borders and second, to facilitate the conversion of that knowledge into benefits for its citizens by the most efficient means available. This is the essence of technology transfer [5]. Technology transfer as a separate field did not appear until the 1970s. It emerged as a result of accelerating awareness of the key role of technology in economic development and its study has essentially been driven by the need to better understand the process, its determinants, its effects on transferor and transferee and factors affecting its control [6]. Companies follow different technology transfer strategies. Several factors determine technology-transfer strategies in the presence of potential imitation, including variable-cost-saving potential, fixed transfer and imitation costs, market potential, and product differentiation [7].

A product is designed to meet certain functional requirements, and to satisfy the customer's needs. New technology and new materials currently available will also be explored during the product design stage. A product consists of assemblies, sub-assemblies and component parts [8]. Product transfer is a key activity in the complex process of new product development. Purposeful management of the product transfer process leads to more effective transfers in terms of timeliness, cost, functional performance, and competence building. Better management of product transfer gives firms access to a greater variety of new technology options, improves a firm's ability to offer significantly differentiated products, deepens the firm's competitive competencies, and positively influences sustained product development success [9].

Companies often incorporate new product technologies in their product designs to help achieve distinctive new products. Companies rarely rely solely on internal research and development for the initial development of all the new product technologies they will employ in a new product system [9, 10]. Accordingly, careful integration of product technologies from external organizations, called the ''product technology transfer process'' here, is an essential competence for new product development organizations. Companies skilled in the product technology transfer process have access to a vastly greater array of technological options and can ration their scarce research and development resources better [9, 11, 12]. This process often is fraught with unanticipated problems and

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excessive risk, leading to product development efforts that are unsuccessful due to time delays in market introduction, cost overruns, and technical functionality problems. It is acknowledged that product technology transfer is conducted regularly in an ad-hoc manner [9, 13].

II. Types of Transfers

A. Production and product transfer

A production transfer is defined as a change or localization in the production location for existing products, where all necessary production resources are transferred or sourced as new (e.g. machinery, plant facilities, assembly and measurement equipment etc.).

A product transfer is a change of the production location or a change from in-house to external production (purchase) or vice versa, if only the tooling, devices and documents for production of the affected products are transferred. In a product transfer, machinery is not transferred and no training will be performed.

The production and product transfer is shown in Fig. 1.

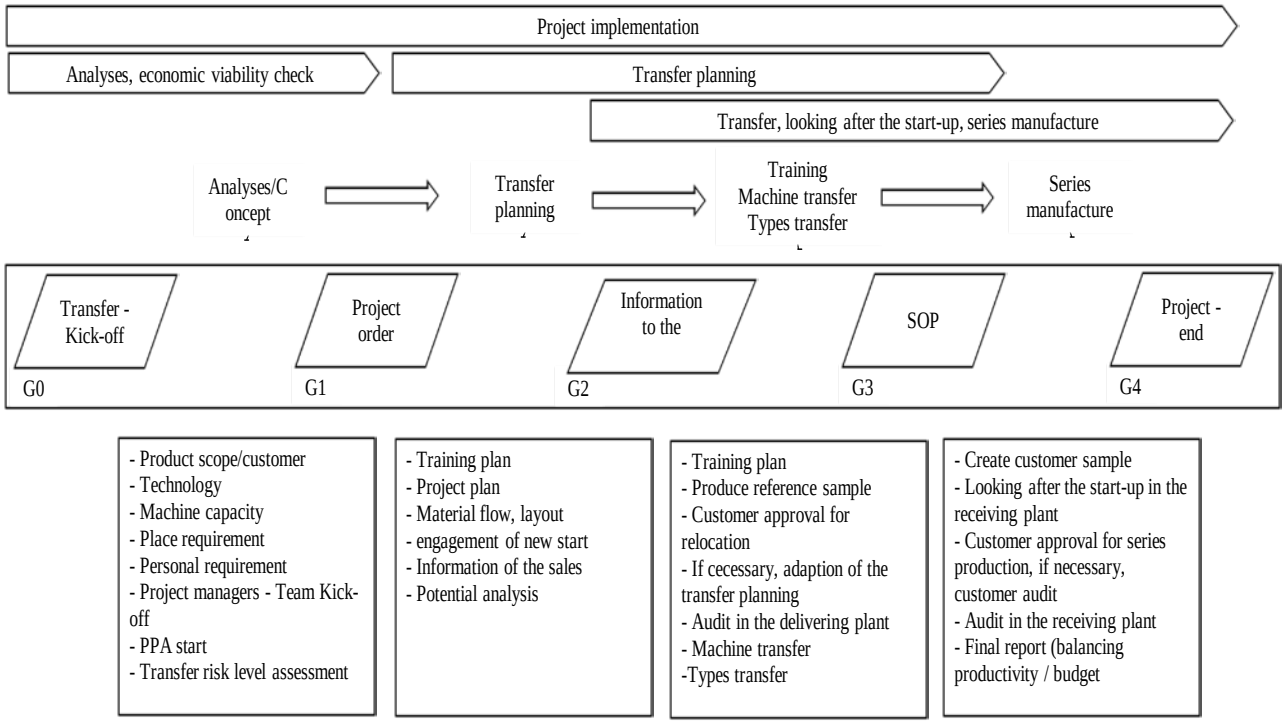

Fig. 1 Production and product transfer

B. Machine transfers

A machine transfer is part of a production transfer or is a local transfer of machines within a plant. The transfer of machines within a plant is carried out by the plant itself and not ruled by central procedures.

III. Production Transfers

A. Project order and basic conditions

The project coordinator in planning of manufacturing locations documents the fact that the transfer has been approved. This is carried out in writing by means of an approved project order. The project order must always be signed by a member of executive management board. For transfer projects which are included in the approved transfer budget list, the project order is also valid if it bears the signature of a member of the relevant business unit.

B. Project manager kick-off

The project manager kick-off represents the official start of a transfer. Invitations are issued by the general project coordinator and the participants are defined by the general project coordinator.

Possible participants are: general project coordinator, project manager at delivering plant, head of planning of manufacturing locations, plant managers, project manager at receiving plant, other participants are possible.

Main subjects or targets of the meeting are: presentation, discussion and definition of project targets (e.g. start-up curve, production figures, key data etc.) and basic conditions, formation of the project organization, definition of the core team, structuring and delimitation of the project, overall planning of the project, definition of support from central departments, preparation of the transfer risk level assessment (RLA), information about the project, disclosure of critical project points.

C. Project team kick-off

The project team kick-off takes place after or together with the project manager kick-off and constitutes the start point for the sub-projects. The core team is defined during this stage, at

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the latest. The project team kick-off is initiated by the general project. A joint meeting of all members is not essential.

Main subjects/targets of the meeting may be: presentation of the project targets (e.g. start-up curve, production figures, key data etc.) and basic conditions, presentation of rough project timetable, presentation of project roles, presentation of tasks and sub-project targets for defined sub-project managers, information about the project, clarify course of action for project work (e.g. status meetings, information channels, project plan, checklist), disclosure of critical project points.

D. Project organization

The project organization is composed of the following: steering committee, general project coordination (PK), support from central functions (support team), project management at delivering plant (PL-A), project management at receiving plant (PL-E), core team with sub-projects, expanded team with sub-projects.

E. Steering committee

The steering committee is composed of executive management board, product line management, plant management, the business unit and the head of planning of manufacturing locations, and supports the transfer projects.

Tasks of the steering committee are: provide the necessary resources and capacity, provide expertise with regard to implementing the relevant project targets, set priorities in the event of an overlap with other tasks and projects, make decisions that cannot be made by the project team, where necessary, arbitrate on problems between all functions involved in the project, carry through overriding corporate interests, inform the general project coordinator at an early stage of any changes to targets/basic conditions.

Authority of the steering committee suppose: access right to information on all cases, definition and modification of project targets and basic conditions, option of making adjustments in the appointment of project managers.

Additional tasks of the head of planning of manufacturing locations are: make sufficient resources available to the general project coordinator, supporting all project managers, granting approval of deviations/conditions on gateway releases.

F. General project coordinator

The general project coordinator coordinates the activities of the project manager's project management at delivering plant (PL-A) and project management at receiving plant (PL-E) and the team members with each other. He coordinates the documents which are relevant to the project (e.g. project plan, checklists) and the sub-projects or work packages with regard to arranging deadlines. He actively and continually monitors the timing targets and reports on their status to the steering committee by means of intermediate reports / status reports. The general project coordinator supports the project team with reporting and documentation. He reports to and receives his instructions from the steering committee. He is the contact person for the steering committee, the supporting central departments and for the project managers. The general project coordinator can call on the support team to assist with monitoring deadlines and costs and documenting the project.

Tasks of the general project coordinator are: raise a project number, creating a project folder and granting access rights, organize the kick-off meetings and status meetings for the overall project, structure the overall project in sub-projects (definition of the project structure), definition of project team building, preparation of the basic project plan, project cost planning and controlling, plan, structure and carry through the overall project, chair project discussions, project documentation for the overall project (intermediate reports, status reports), ensure internal communication (identical information for all team members), introduce necessary measures / develop proposed solutions, process the general project coordinator's checklist points, approval of gateways, monitoring of deadlines for gateway deviations, prepare project final report, terminate project and dissolve project team.

Authority of the general project coordinator suppose: authority to issue directives to project managers and project team within the project, access right to information on all matters which are relevant to the project, definition and agreement of work packages, access to all costs which are relevant to the project, right of escalation to steering committee, release of necessary capacities by line manager, option of making adjustments to team composition.

G. Support from central departments (support team)

This support is composed of cross-plant central departments (quality management, process/production development, product development, business management, controlling, personnel management, legal department). Support from central departments can be requested as required by any individual team member.

Tasks of the support team are: agreement of activities with the general project coordinator as necessary, process work packages at an early stage and at the correct cost, assist with technological, qualitative, business management, personnel or legal issues.

Authority of the support team: right of escalation to relevant originator.

H. Project managers (PL-A and PL-E)

Tasks of the project managers refers to: responsibility for the overall project, suggest project team members, prepare and maintain the detailed project plan (based on the basic project plan), reporting and target monitoring for the sub-projects, ensure internal communication (identical information for all team members), disclose problems and critical activities to the general project coordinator, responsible for the achievement of the project targets, processing checklist points of the project manager, responsible for the processing and quality of the checklists, granting approval of deviations / conditions on gateway releases.

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Authority of the project managers suppose: authority to issue directives to sub-project managers within the project, access right to information on all matters which are relevant to the project, definition and agreement of work packages, right of escalation to general project coordinator, release of necessary capacities by line manager, option of making adjustments to team composition.

I. Core team

The core team is composed of PK, PL-A, PL-E and the sub-project managers that are essential for a transfer project and have responsibility for the most important and most extensive sub-projects. The composition of the core team can be freely selected and is formed at the project start-up meeting (project manager kick-off or project team kick-off) by PK, PL-A and PL-E.

Tasks of the core team are: agreement and optimization of individual activities, bundling of information and results, development of solutions to problems and alternatives for achieving targets.

J. Expanded team

The expanded team is composed of sub-project managers who are necessary for achieving the project target but not for the regular status meetings. These are smaller work packages covering a limited period of time. The composition of the expanded team is formed at the project start-up meeting (project manager kick-off or project team kick-off) by PK, PL-A and PL-E.

K. Sub-project manager

The general project coordinator selects the team and defines the sub-projects which are relevant based on organizational aspects and with regard to content. For the specific transfer projects, the scope of the sub-projects is defined by PK, PL-A and PL-E.

Tasks of the sub-project manager are: plan and carry through sub-projects, if necessary, form and lead a sub-project team, ensure availability of resources, reporting and target monitoring for the sub-project (costs, time, functionality and quality), disclose problems and critical activities to the core team at an early stage, develop proposals for solutions and initiate measures, documentation of results, processing checklist points of the sub-project manager.

Authority of the sub-project manager suppose: access right to information on all matters which are relevant to the project, right of escalation to project manager, release of necessary capacities by line manager, veto on nomination as sub-project manager.

III. PROJECT PLANNING AND PROJECT DOCUMENTATION

The procedure for a transfer and the information flow is shown in the flow charts of Fig. 2. Gates 2 to 4 may be passed several times in this case and gate 4, which is planned as the last in the sequence, constitutes the end of the transfer. If gates 2 to 4 are passed several times, it is the responsibility of the general project coordinator to decide which checklist points should be processed. In the case of transfers, an audit is to be planned at the delivering plant prior to moving machinery and at the receiving plant once the move is complete.

A. Internal transfer announcement

The internal transfer announcement stating all products to be transferred is passed to sales at an early stage and by no later than gate 2. Sales are responsible for notifying customers and obtaining the customer's consent for approval of volume deliveries. The transfer timetable and the required product lead stock must be agreed with the customer as necessary. If this is rejected by the customer, sales have the task of obtaining approval for volume delivery by further measures. Sales must inform the general project coordinator of the current status of approval so that he can introduce the implementation steps.

Components of the internal transfer announcement: reason for transfer and background information, name of general project coordinator, project manager at delivering plant and project manager at receiving plant, planned transfer date, possible sample delivery date, product list, brief description of the receiving plant, customer letter, and checklist from legal department.

B. Project plan

The project manager with main responsibility (generally PL-A) prepares a project plan with support from the general project coordinator and the project manager at the receiving plant. This project plan contains the most important milestones and transfer steps, the summarized sub-projects, the degree of completion, the persons responsible and the start and end dates. The sub-project managers of the delivering and receiving plant create sub-project plans/activity plans by request of the general project coordinator. The software tool used to prepare the sub-project plans and activity plans can be freely selected on the basis of availability and capability. Continuous monitoring of activities should help to improve the consistent realization of planning.

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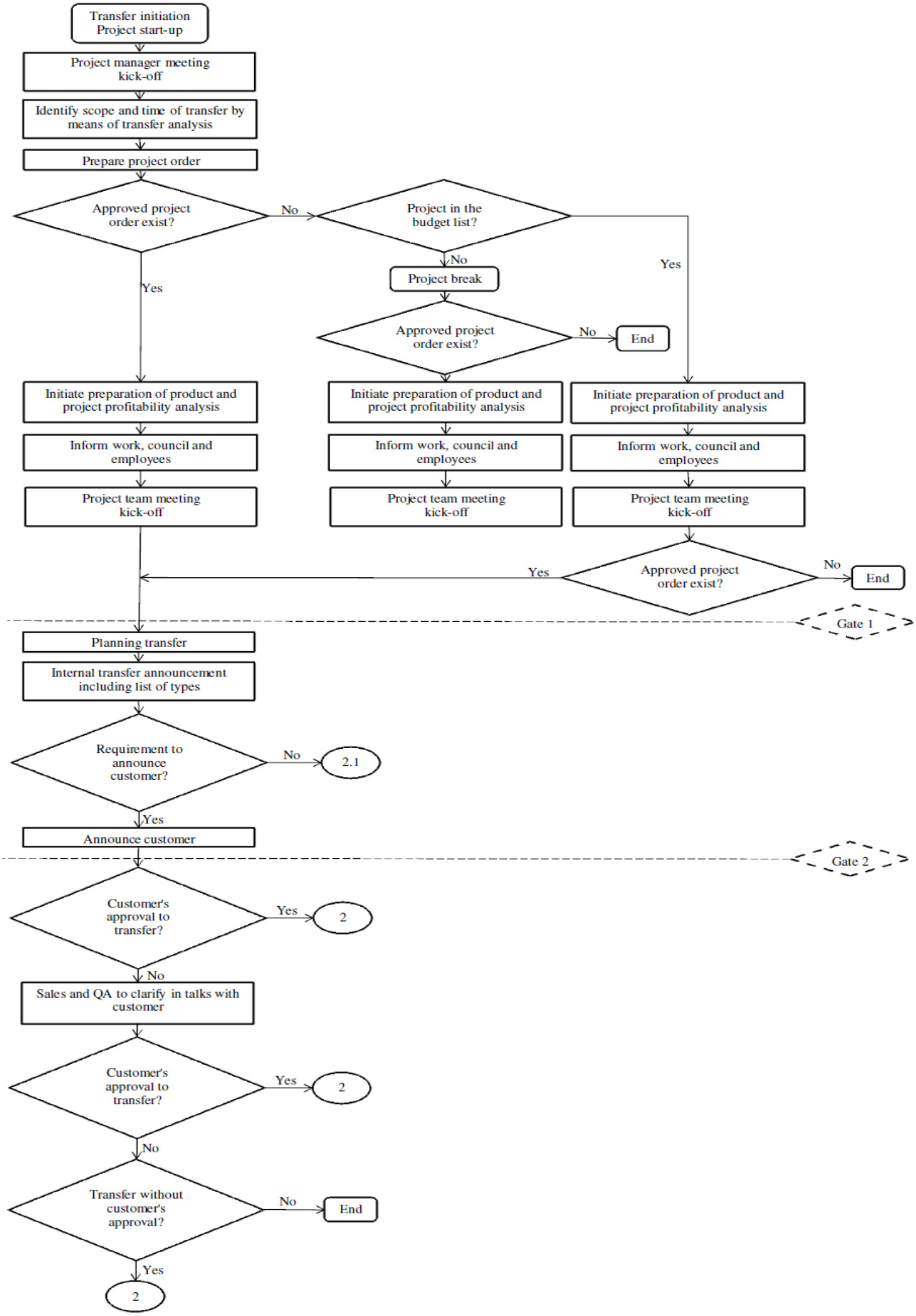

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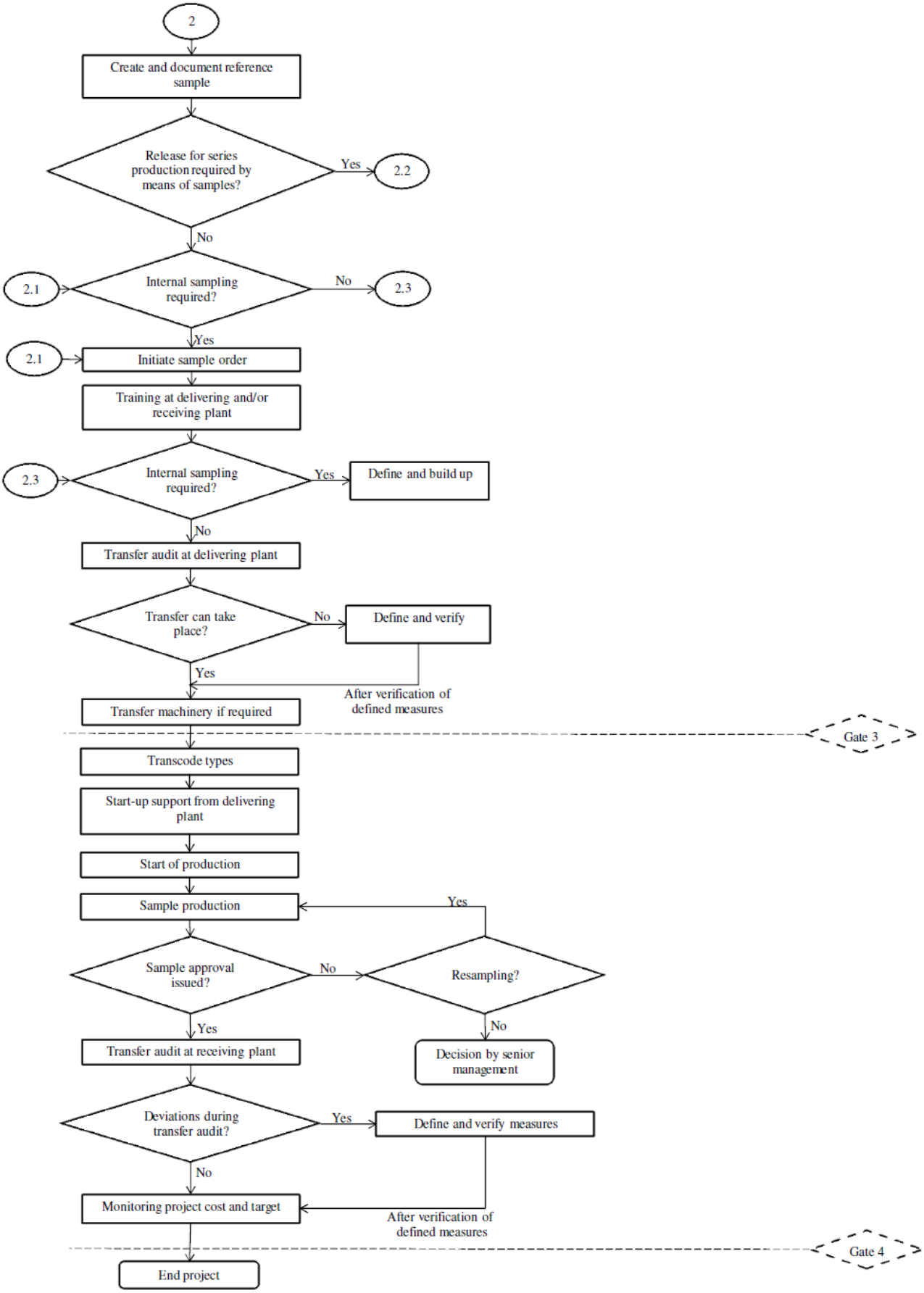

Fig. 2 Project transfer

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Changes and deviations of the planned activities must be included in the project plan in a timely manner in order so that an overview of the large number of individual stages and details can be obtained at any time. It is advisable to enter an appropriate note in the project plan when changes occur. Continuous monitoring of activities should help to improve the consistent realization of planning.

C. Checklist

Checklists are specifically allocated to the sub-projects that are also assigned in timing terms to the gates. If the project is divided into several transfer stages, the checklist must be processed several times as necessary indicating the associated stage in the headline. The checklist points are obligatory and prove that a project phase has been completed. Responsibility in the specific sub-project (naming of a specific person) for processing of checklists is indicated in the general checklist under the checklist overview. The status must be recorded for each checklist point.

Approval of a transfer gateway is granted by the general project coordinator following completion of the individual checklist items for this gateway. If individual items have not yet been completed or are critical, the general project coordinator can decline approval of the gate. In the event of gateway deviations, approval must be granted by the PL-A, PL-E, PK and a representative from the steering committee. The general project coordinator is responsible for monitoring the gateway date deviations. Documentation/monitoring takes place in accordance with the project plan or minutes of the status meeting.

D. Status meetings

The status meetings are to be held regular or demand-oriented in order to maintain a uniform level of knowledge in the project team. They are an important instrument for discussing the progress of a project progress, activities, problems and possible solutions. Invitations are issued by the general project coordinator and the participants are defined by the general project coordinator.

E. Training and monitoring of training

In production transfers, employees of the receiving plants are to be trained usually before machinery is moved. The training serves to communicate theoretical and practical knowledge of products, machinery and processes. The delivering plant notifies the receiving plant of the training times and the required qualifications at an early stage in the transfer planning phase so that personnel selection or the appointment strategy can be defined. The training requirements for direct and indirect areas are to be defined from the project team.

In order to define the scope of training must be prepared a training plan for each individual employee that records all knowledge and activities. The success of training is discussed in regular meetings between the trainers and their line managers in order that any further or special training can be derived from this. The trainee receives feedback on the status of his training on one or more occasions, depending on the length of the training. At the end of his training period, the trainee receives his instruction evidence of training, including the targets achieved, by means of a copy to his line manager. In each case, instruction evidence of training, including the targets achieved, must be prepared by the trainer at the delivering plant and by the trainee. If he has not completed all of the training content, a decision is made on whether to extend the training measure or carry out further training at the receiving plant.

F. Intermediate reports for the steering committee

If the project status is critical, an intermediate report must be prepared for the steering committee. The intermediate report is a brief overview of the transfer project and informs the steering committee of the project status. The intermediate report content: current project status, highlight deviations from the plan, indicate countermeasures and reasons, reference to potential risks.

G. End of the project

As soon as all of the relevant transfer activities in the project plan / activity plan are completed and the audit measures have been implemented, the general project coordinator must prepare a final report. The final report content: status of activities, checklist points and targets, planning (nominal), transfer process, project results (actual), other activities, including responsibilities, conclusion/empirical values, findings for other projects.

Authority of the sub-project manager suppose: access right to information on all matters which are relevant to the project, right of escalation to project manager, release of necessary capacities by line manager, veto on nomination as sub-project manager.

V. Conclusion

Production transfers include the following conditions: change in the production location for existing products, technology in the receiving plant not available, training is required, and machinery/facilities are being transferred. Restriction of production transfers: if the risk level assessment for the production transfer indicates a significantly reduced training requirement in conjunction with the movement of machinery for identical or strongly related processes, the particular case can be processed in low-risk cases as a product transfer. This applies under the following conditions: all four assessment categories in the risk level assessment are classified as green, commercial risk and/or application risk classified as yellow. The decision on a possible product transfer is made in consultation with the product line and planning of manufacturing locations and documented. Even if the conditions for a production transfer are not fulfilled, the particular case can be processed with project Management and planning of manufacturing locations. The decision is made in consultation with the product line and location planning and

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has to be documented.

The responsible project managers at the delivering plant and receiving plant are equally responsible for the success of a project (tandem concept). The overall responsibility for the transfer and start up production of the transferred products lies with the project manager at the delivering plant, except for when the receiving plant is technologically more advanced than the delivering plant. Responsibility for updating the project plan lies with the project manager at the delivering plant with main responsibility, whereas responsibility for updating the sub-projects lies with the sub-project managers. The general project coordinator must be informed of any serious status changes.

The activities for the project plan / activity plan are derived from the checklists. They represent a minimum requirement for a transfer project and contain the most important transfer items. Deviations from the checklists are documented in the gateway release with activities and dates. If a sub-project is not opened, the general project coordinator must check the checklists for these sub-projects and derive any activities, appoint the persons responsible and document these as necessary. If a checklist item is not valid for the transfer, this must be recorded in the field "comments". Furthermore, reference must be made to documents and paperwork in the "comments" field. If a checklist item cannot be processed by the submission date, the person with responsibility must define an appropriate activity and obtain a deviation approval.

In the event of deviations from targets, checklist points, audits and outstanding long-term activities, these are divided up into critical and non-critical deviations by planning of manufacturing locations and the project managers. In the event of critical deviations, the project is not closed out and a new project final date is defined between planning of manufacturing locations and the project managers. In the event of non-critical deviations, an action plan is prepared with the responsible persons. Reference is made to this action plan in the final report and a copy is then attached to the final report. After presentation of this project final report, the general project coordinator must dissolve the project team. The general project coordinator closes the project number and archives and deletes the project drive.

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An Evaluation of 'Subjective Measures': Organisational Performance influenced by Personal Knowledge Management and Leadership Styles: An Investigation into the Healthcare Industry in Thailand

Vissanu Zumitzavan and Atthaphon Mumi

Abstract— This paper examines the relationship between the demographics of respondents, personal knowledge management, leadership styles, and organisational performance, and discusses to what extent the personal knowledge management and leadership styles of top management are supportive to the healthcare industry. The research sampled 539 top management of hospitals in Thailand by survey questionnaires. Different statistical techniques were applied to test hypotheses: descriptive statistics, correlation and hierarchical multiple regression analysis. Results show that personal knowledge management and leadership styles do influence organisational performance. In addition, results indicate that the association between personal knowledge management and organisational performance is mediated by the leadership style.

***Keywords*—**Leadership Styles, Organisational Performance, Personal Development, Personal Knowledge Management.

I. Introduction

Globalisation has both generated new opportunities and presented obstacles. Large organisations with a vigorous history embedded in their foundations can no longer survive unless they keep adapting themselves to suit different trends [1]. It is complex for any organisation to compete at international levels. Top management which is capable of competing successfully in the context of globalisation is indispensable in any business [2].

This is equally true in the healthcare industry. Von Eiff [3] stressed that the rise in the incidence of chronic diseases and severe illnesses is putting increasing demands on medical services. Patients themselves are becoming more demanding, expecting not only the best medicines, but also a better therapeutic environment. Through observing its organisational performance with a view to gaining competitive advantage any organisation can adapt itself by its changing business environment, even with limited resources; if they are valuable, rare, inimitable and non-substitutable [4]. Even though not all organisations in the healthcare industry are equipped to meet customers' satisfaction, those attaining higher levels of competitive advantage will achieve better levels of organisational performance.

For example, Weil [5] investigated non-profit and commercial healthcare organisations in the G-7 countries, including the UK, US and Germany. Findings indicated that private hospitals in those countries were likely to attain higher returns. The results also pinpointed the key factor explaining why these hospitals gained higher returns than the non-profit ones. It is because they possess considerable capital for funding; they know how to make the most use of their scarce facilities; and they know how to share knowledge within the organisation, enhancing the skills of organisational members which in turn leads to raising the level of organisational performance.

Wright [6] confirmed that organisations have become increasingly dependent upon the contributions of knowledge workers. Knowledge workers in an organisation are those with a high level of expertise, education and experience, whose primary role involves the creation, distribution or application of knowledge. Academics have proposed that the concept of organisational learning has a positive impact on enhancing organisational performance [7], in which top management encourages a learning environment within their organisations; knowledge needs to be shared at every level of the organisation.

More importantly, scholars have also emphasised that personal knowledge management (PKM), leadership styles, and organisational performance are crucial and interrelated variables contributing to organisational performance, and thus there is a critical need to examine these relationships [8-10]. As such, PKM can be seen as part of knowledge management (KM), which is concerned with different management teams carrying out day-to-day responsibilities and also influencing their leadership styles to have the biggest impact on the development of organisational performance. Thus, appropriate PKM may involve the factors for creating and encouraging leadership styles, which in turn can improve organisational performance overall.

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II. Research Background

The aim of this research is to investigate which types of PKM and leadership styles are supportive to the organisation. The healthcare industry in Thailand was taken as the unit of analysis. Like other ASEAN countries, Thailand is confronting another challenge: in 2003 the ASEAN summit declared the establishment by 2015 of the ASEAN Economic Community (AEC), to encourage the free movement of commodities, services, investment and capital [11]. Nearly all the countries are aiming to be equipped to acquire the most advantage out of the AEC. Moreover, various industries are shaping their organisational strategies to cope with oncoming trends. Thailand's healthcare industry is the focus of this research since its development may affect various aspects of national competitiveness.

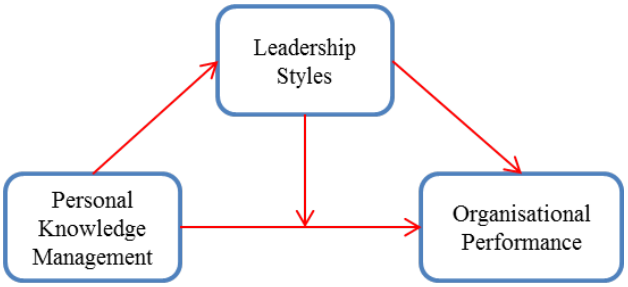

Fig. 1 Research Conceptual Framework

Independent variables: The demographics of top management, number of employees, the PKM, and leadership styles.

Dependent variable: Organisational performance; the top management of each hospital were asked to evaluate their financial performance compared with other hospitals in their sector.

Figure 1 illustrates the connection between the demographics of the respondents, PKM, leadership styles, and organisational performance. These concepts are applied to explain the unit of study, hospitals in Thailand.

III. Literatures

A. Personal Knowledge Management

The literature on KM focuses on the organisational level, that is it typically emphasises organisational knowledge management [12]. Several KM studies were performed at organisational level [12-14]. Thus, in recognising the disciplines from individual learning to organisational learning, there is room for investigation. Formerly, there were few researches in this field, although several attempted to define PKM [15-21].

In addition, PKM is the best scheme for individual purposes [15] and it has become part of personal knowledge bases. It provides a strategy for transforming and gathering information to make the most use of it. Avery et al. [16] and Jarche [20] proposed different aspects and argued that PKM assumes that individuals have developed a self-awareness of their limits and abilities, i.e. what one knows and what one can do. It is an understanding of what one knows, how one accesses the things one knows, strategies for acquiring new knowledge and strategies for accessing new information as needed. In the vast amount of information available and the various approaches for attaining new information, they have planned their own areas of expertise and their own methods for additional learning.

Higgison [17] referred to organising and maintaining PKM: being accessible, meaningful and valuable to the individual; maintaining networks, contacts and communities; making life easier and more pleasant, and exploiting personal capital. Jefferson [18] proposed that 'PKM is concentrated on a bottom-up approach, with an individual perspective to KM'. The goal is to enable the individual to select useful, well-structured information, and who to share it with. Individuals should be able to organise their own information so that it can be considered meaningful and accessible when needed to be simply exploited. PKM signifies the process of individuals to accomplish knowledge and handle embodied and encoded knowledge [19] Martin [21] explained that PKM is a set of knowledge facilitating individuals to accomplish goals and to generate new knowledge.

In addition, Drucker [22] found that knowledge organisational members have positive effects on organisational performance, through individual decision making and individual boundaries [23]. According to Pauleen [12], PKM is the process of self-development. It is undeniable that the individual plays a crucial role in organisational learning and KM. Nonaka and Tayama [24] suggested that new knowledge always starts with individuals. Thus, organisations need to devote more efforts to promoting, developing, valuing and managing their employees as individuals [25].

Ahmed et al. [26] asserted that PKM comprises individuals combining and sharing their experience, skills, intuition, ideas, judgment, contexts, motivations and interpretations. Pauleen [12] also recommended that in the knowledge-driven society, it has become indispensable for individuals to maintain, develop and contribute their skills in the pursuit of competitive advantage in the professional market, both short and long term. The PKM skill model of Avery et al. [16] identified seven information skills: 1) retrieving, 2) evaluating, 3) organising, 4) analysing, 5) collaborating, 6) presenting, and 7) securing.

Hence, it is clear that PKM is the process of how individuals perceive and transfer knowledge, making it easier to implement valuable knowledge and apply it in day-to-day situations within the organisation.

B. Leadership Styles

Leadership style is a key factor related to organisational learning, accomplished by building a sense of commitment based on the shared vision among members of the organisation [27, 28]. Daft [29] recommended that leadership style is especially

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significant in organisations seeking to transform themselves into learning organisations. It is important to note, however, that different styles of leadership may result in improved approaches to encouraging employees [30]. Similarly, Taylor and Rosenbach [31] recognised that although an individual has the potential to hold a positions as leader or top management, no single style or personality is best for all situations. Nevertheless, regardless of which styles are adopted, it is widely accepted that leadership is an indispensable perspective which top managements needs to understand to promote organisational learning.

Heskett and Kotter [32] were among the first to demonstrate that the single most important driver in successful organisational change is competent leadership. Leaders offer the highest leverage point for changes to take place because they are critical in establishing the strategic directions of the organisation, as well as in creating and maintaining their culture [32]. More importantly, scholars have emphasised that leadership and performance are two important and interrelated variables contributing to organisational performance, and thus there is a critical need to examine this relationship (see, for example, [33-35]). It appears that leadership is an important quality of top management in their role to encourage learning, share knowledge with and transfer it to employees by means of appropriate styles in different situations for the purpose of achieving organisational goals.

To date, a number of studies have investigated leadership style to find different ways to increase organisational performance. For example, in highlighting the importance of knowledge-based diversity for Research and Development Divisions, Shin and Zhou [36] found that transformational leadership and educational specialisation heterogeneity interact with one another, which may greatly improve teams' creativeness. They found that the two variables are strongly correlated with a team's creativeness. In particular, the team's creative efficiency mediates in the relationship between educational specialisation and heterogeneity, transformational leadership and teams' creativeness.

Rowold and Heinitz [37] studied the relationship between transactional and transformational leadership and their impact on performance. 220 employees were asked to evaluate their top management. Hierarchical multiple regression methods were used to analyse the data. First, they found that transformational leadership was correlated with organisational performance. Secondly, transformational leadership had a stronger correlation with organisational performance than transactional leadership. They also found that transformational leadership improved organisational performance.

The effects of transformational leadership on organisational performance were also studied by Colbert et al. [38]. Their findings revealed that transformational leadership was positively interconnected to within-team goal importance congruence, which in turn was positively related to organisational performance. Similarly, Howell et al. [39] found that transformational leadership is positively related to organisational performance, while transactional leadership was not significantly associated with it.

These findings also suggest that physical distance between top management and employees negatively affects the relationship between transformational leadership and organisational performance but has a positive influence on the relationship between transactional leadership and organisational performance.

Several studies found that gender is significantly correlated with leadership styles: female top managements are likely to adopt more transformational leadership styles [40]. However, Oshagbemi [41] and Bass et al. [42] found that gender is not significantly correlated with the leadership style of top managements, although they did find that age is.

Leadership theory has also been applied in studies of the relationship between human resource management and the leadership style of top management. Zhu et al. [43] studied 170 Singaporean organisations and found that human resource management fully mediates the relationship between top managements' transformational leadership and subjective assessment of organisational performance. It also partially mediates the relationship between top managements' transformational leadership and absenteeism.

In a different context, Walumbwa et al. [44] studied the nature of the relationship between transformational leadership and two work-related attitudes, i.e. organisational commitment and job satisfaction. They compared Kenya and the United States, obtaining a response rate of 82 per cent from Kenya and 86 per cent from the USA (158 and 189 respondents respectively). They established that transformational leadership has a strong and positive significant correlation with organisational commitment and job satisfaction in both cultures. The results suggest a strong connection between learning and leadership. Specifically, they found that the active use of a variety of strategies for learning from experience has a significant, positive relationship with transformational leadership. Learning through action was found to be a significant predictor of transformational leadership. They further suggested that future research should expand the scope of their analysis to include the demographics of top management, such as gender, age, experience in management, level of formal education, as well as personality factors, to explain additional variance in transformational leadership.

In relation to cultural differences, Hofstede [45, p.81] emphasised that 'there is no such thing as universal management theories'. He explained that in the American sense, top management are not the proprietors of the organisations but contribute their skills to perform on behalf of the owners; and they do not produce personally but are essential in motivating others to produce. They also hold a high status, as cultural heroes, and many American men and women aspire to the role of top management. Hofstede [45] also proposed that among the

champions of economic development over the previous thirty years were three countries mainly populated by Chinese living outside the Chinese mainland: Taiwan, Hong Kong and Singapore.

House et al. [46] acknowledged that Thailand is a developing country, the majority of whose people are Buddhist; they suggested that in such countries, particularly in the rural areas, the normal way of life is such that children take care of their parents and provide material help in their old age. Hence, it may be possible that the religion of Thailand has developed a culture in which Thais are likely to be generous and normally look after their parents. This shows that respondents in Thailand, who attain the highest rate of self-protective (closely linked to transformational) leadership, are likely to inspire, to motivate, and to expect high performance outcomes, and are relatively attached to the teaching of Buddhism which encourages people to be kind to others.

Related to its culture, House et al. [46] also found that Thailand scores highest on the future-oriented value scales, defined as the degree to which individuals in organisations or societies engage in behaviours such as planning, investing in the future, and delaying individual or collective gratification. They proposed that this may be because Thailand has a distinct emphasis on Buddhism. In contrast, they found that the industrialised or developed countries with higher-income nations attained a lower score on the future-oriented value scales. They explained that the higher-income nations may prefer to appreciate the present more because they have already accumulated substantial wealth and material resources. The lower-income nations may see a stronger need for taking a long-term perspective and sacrificing for the future because they must cope with scarce and limited resources. This shows that culture may influence Thai perception, making it different from others. Understandably, the appropriate leadership in other cultures may not be appropriate in Thailand.

C. The relationship between PKM, Leadership Styles and Organisational Performance

In considering the leadership style of top management, Kouzes and Posner [47] stated that role experience is strongly connected to the way top management learns how to lead. This shows that experience would allow top management to effectively learn from their own and others' experience. Brown and Posner [48] found that how people learn is significantly correlated with how they act as top managers. The results also indicated that top management who frequently engaged in PKM also employed a greater variety of leadership styles, such as challenging, inspiring, enabling, modeling and encouraging. PKM and transformational leadership styles are significantly correlated.

Marquardt and Waddill [49] also asserted that what top management learn and how they learn cannot be unconnected, because how individuals learn influences what they learn. This suggests that PKM, which helps top management to understand how they learn, may also help them to learn more effectively. Ellinger et al. [50] found that the majority of people in the workplace learned in an informal manner. Similarly, Fox [51] proposed that much of what is learned by top management is learned informally.

In contrast, McCall et al. [52] found that the factors that have an impact on the development of leadership are job assignments that the top management had experienced; critical situations that they had gone through; relationships and interactions with others; and formal training and education. Posner [53] also proposed that people learn from their experience, whether formal or informal, structured or naturally occurring [54].This leaves room to investigate to what extent PKM has a positive correlation with leadership styles, and facilitates top management to apply their experience more effectively in practice.

Understandably, the careful development of top management can have a positive impact on organisational performance [55]. More specifically, in the healthcare industry, top management who know how to learn and utilise their leadership styles effectively will be able to sustain the unique capabilities of their employees through increased competitive advantage [56]. In the long term, this would enhance organisational performance.

IV. Sample and Data Collection

In line with Saunders et al. [57], 'the majority of top managements are familiar with the deductive approach so that those top managements or policy-makers tend to put faith in the conclusions emanating from this approach.' Therefore, hospital directors or top management have been selected as the unit of analysis in this research.

The questionnaire is one of the most widely used survey data-collection techniques. It refers to all techniques of data collection in which individuals are asked to respond to the same set of questions in a predetermined order [58].

In this research, the survey was conducted with different top managements, to understand the correlation between their demographics, PKM and leadership styles and organisational performance. In addition, the quantitative approach is less time consuming. Choice of hospital top management, within the same industry, as the unit of analysis ensures that they have the same levels of understanding and backgrounds, and the nature of their position allows them to deal with different circumstances in the business. Therefore, in this research, the quantitative approach was applied to study the behaviour and attitudes of top management.

According to the Ministry of Public Health of Thailand (MOPH)'s statistical data in 2006, there were 1,468 hospitals throughout Thailand. Samples were classified by the Stratified Random Sampling method ensuring that they were equitably selected with different locations in various provinces. Prior to conducting the questionnaire, postal letters, e-mails, and telephone calls were made to arrange times and to ascertain that these managers were willing to participate in the survey.

Respondents were assured of the confidentiality of their answers, and were also notified that a copy of the results would be provided, although no individual names would be identifiable from the published information.

Questionnaires were distributed to the top management of selected hospitals in Thailand. Krejcie and Morgan's popular formula was used to determine sample size [59]. Their table shows that for a population of 1,500, a sample size of no less than 306 is recommended. Ames [60] suggests that mail surveys are expected to have response rates of 11 to 15 per cent. In this research, questionnaires were therefore sent out to 1,000 of the 1,468 organisations. A total of 539 completed questionnaires were received, which amounted to a response rate of 53.90 per cent. This is an extremely positive response rate which could improve the validity of the research and generalisability of the findings.

V. Data Analysis and Discussion

A sequential or hierarchical analysis of a set of independent variables may often produce the coefficients necessary to answer the scientific questions at hand. In the hierarchical form, the set of independent variables is entered cumulatively in the R^2 and partial regression and correlation coefficients are determined when each independent variable joins the others [61]. A full hierarchical procedure for a set of independent variables consists of a series of regression analyses, each with one more variable than its predecessor. The choice of a particular cumulative sequence of independent variables is made in advance, as emphasised by the purpose of the research. Moreover, the researcher should be guided by the theoretical foundation that originally led to the research question [62]. The higher the correlation between the independent and dependent variable, the better prediction equation they can provide [62]. This research framework has three main groups of independent variables: demographics of respondents and number of employees, PKM, and leadership styles. Consequently, the relationship between independent and dependent variables was tested to attain the results precisely, and hierarchical regression analysis was applied.

A. Hypotheses

H_1: Different demographics lead to different levels of organisational performance.

H_2: Different PKM leads to different levels of organisational performance.

H_3: Different leadership styles lead to different levels of performance.

H_4: The relationship between demographics, PKM, and organisational performance may be mediated by leadership styles.

Table I: Model Summary (Demographics of Respondents, PKM, and Leadership Styles)

Model predictors	Sig	R^2	Adjusted R^2
Model 1: Gender, Age, Education, Experience, Number of Employees	0.000	0.259	0.252
Model 2: + Retrieving, Evaluating, Organising, Analysing, Collaborating, Presenting, Securing,	0.000	0.534	0.523
Model 3: + Transformational, Transactional, Laissez-faire Leadership Styles	0.000	0.774	0.767

Dependent Variable: Organisational Performance

Model 1 (see Table I) with Gender, Age, Education, Experience, Number of Employees as independent variables, has $R^2 = 0.259$. This means that these independent variables could explain the dependent variable, organisational performance, approximately 25.9%. After some independent variables were added to Model 2, R^2 increased to 0.534. Model 3 clearly shows that once leadership styles were added, R^2 increased to 0.774. In addition, Hair et al. [63] recommend that R^2 is the best standard to use when comparing regression models. Therefore, it can be concluded that the set of independent variables in Model 3 is the most valuable in predicting the dependent variable.

H_0: $\beta_1, = \beta_2 \ldots = \beta_k = 0$, there is no significant linear relationship between the set of predictors composed of gender, age, education, experience, number of employees, retrieving, evaluating, organising, analysing, collaborating, presenting, securing, transformational, transactional, laissez-faire leadership, and the dependent variable, organisational performance.

H_1: $\beta_i \neq 0$, i = 1, 2… k, there is a significant linear relationship between the set of predictors composed of gender, age, education, experience, number of employees, retrieving, evaluating, organising, analysing, collaborating, presenting, securing, transformational, transactional, laissez-faire leadership, and the dependent variable, organisational performance.

The results of ANOVA suggest that the P value is equal to 0.000 which is less than 0.05; therefore, the null hypothesis is rejected. It could be concluded that there is a significant linear relationship between the set of predictors composed of gender, age, education, experience, number of employees, retrieving, evaluating, organising, analysing, collaborating, presenting, securing, transformational, transactional, laissez-faire leadership, and the dependent variable, organisational performance.

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Once, a set of independent variables impacts on the dependent variable, the prediction equation can be ascertained.

B. Beta Coefficient

$$Y = \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \beta_{13}X_{13} + \beta_{14}X_{14} + \beta_{15}X_{15}$$

Where:

Y = Organisational Performance
β_i = Beta Coefficient
X_1 = Gender
X_2 = Age
X_3 = Education
X_4 = Experience
X_5 = Number of Employees
X_6 = Retrieving
X_7 = Evaluating
X_8 = Organising
X_9 = Analysing
X_{10} = Collaborating
X_{11} = Presenting
X_{12} = Securing
X_{13} = Transformational Leadership
X_{14} = Transactional Leadership
X_{15} = Laissez-faire Leadership

C. Model Predictors

Organisational performance = – 0.035 (gender) + 0.094 (age) + 0.023 (education) + 0.031 (experience) + 0.050 (number of employees) – 0.041 (retrieving) + 0.205 (evaluating) + 0.025 (organising) + 0.106 (analysing) – 0.052 (collaborating) + 0.105 (presenting) + 0.026 (securing) + 0.440 (transformational leadership) + 0.359 (transactional leadership) – 0.053 (laissez-faire leadership).

From the prediction equation, it was found that the most powerful predictor in the Standardised Coefficient Equation was transformational leadership (Beta Coefficient = 0.440). This indicated that transformational leadership has a positive relationship with organisational performance, followed by transactional leadership (Beta Coefficient = 0.359) which also has a positive relationship with organisational performance. Next, the Beta Coefficient of evaluating is 0.205. The results suggest that evaluating has a positive relationship with organisational performance.

Hence, it can be concluded that different demographics of respondents, PKM, and leadership styles lead to different levels of organisational performance. Therefore, Hypotheses 1, 2, and 3 were accepted.

In addition, as can be seen from Table II, it was found that the tolerance of each predictor is not lower than 0.100 and the Variance Inflation Factor (VIF) does not exceed 3.16. In line with Hair et al.'s [63] guidelines, no evidence of multicollinearity was found.

D. Mediation Testing

Table II: Coefficient (Standardised Coefficients of 1st and 2nd Equations)

Variables	Standardised Coefficients (1st Equation)			Standardised Coefficients (2nd Equation)		
	Sig	**R^2**	**Adjusted R^2**	**Sig**	**R^2**	**Adjusted R^2**
	0.000	0.534	0.523	0.000	0.774	0.767
	Beta	**Tolerance**	**VIF**	**Beta**	**Tolerance**	**VIF**
Gender	-0.016	0.980	1.021	-0.035	0.978	1.023
Age	0.360	0.828	1.208	0.094	0.658	1.521
Education	-0.005	0.919	1.088	0.023	0.910	1.099
Experience	-0.008	0.924	1.082	0.031	0.734	1.363
Number of Employees	0.075	0.965	1.036	0.050	0.955	1.047
Retrieving	-0.017	0.894	1.118	-0.041	0.764	1.309
Evaluating	0.445	0.848	1.179	0.205	0.705	1.419
Organising	0.052	0.971	1.030	0.025	0.960	1.042
Analysing	0.192	0.830	1.204	0.106	0.781	1.280
Collaborating	-0.055	0.832	1.202	0.052	0.783	1.277
Presenting	0.082	0.946	1.057	0.105	0.931	1.074
Securing	0.026	0.963	1.039	0.026	0.925	1.081
Transformational	-	-	-	0.440	0.563	1.777
Transactional	-	-	-	0.359	0.640	1.561
Laissez-faire	-	-	-	-0.053	0.710	1.408

Dependent Variable: Organisational Performance

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1st Equation: Organisational Performance = α Number of Employees and Demographics of Respondents + α PKM

2nd Equation: Organisational Performance = α Number of Employees and Demographics of Respondents + α PKM + α Leadership Styles

Hair et al. [63] strongly suggest the adjusted R^2 in comparing models with different numbers of independent variables. The adjusted R^2 is also useful in comparing models between different data sets because it will compensate for the different sample size (p. 234). Hence, in this research, the adjusted R^2 was considered for comparing two equations. The adjusted R^2 for the second equation was 0.774, which is greater than the adjusted R^2 of the first equation, 0.534. This indicates that the set of independent variables in the second equation explains the dependent variables more fully than the set of independent variables in the first equation. In addition, when adding the leadership variables into the equations, the Beta Coefficient values of the PKM variables change. This suggests that the effect of PKM on organisational performance was mediated by leadership styles. Hence, Hypothesis 4 was accepted. It can be concluded that the relationship between the demographics of respondents, PKM, and organisational performance are mediated by leadership styles.

VI. Implications of Research Findings

Several researchers have demonstrated that PKM provides top management with more insight by assisting them to generate a learning environment for their organisational members and developing their learning experiences effectively to transfer knowledge to their employees (see, for example, [15-17], [19-20]).

In this research, it was also found that PKM has a positive correlation with organisational performance, consistent with the findings of Lincoln and Guba [64]. Therefore, it would be helpful for top management to encourage learning in the organisation by applying effective PKM, Bass and Avolio [65], to transfer knowledge and skills to the organisational members. Furthermore, top management may need to encourage organisational members to share ideas and then try them out in practice. At the same time, top management may need to take some time to reflect on and gather the information.

To be effective, top management needs to be active in developing their PKM and leadership styles by attending relevant training programmes, as provided by both academic and private institutions [66].

In conclusion, it is necessary for managers to apply effective PKM and leadership styles to encourage learning in the organisation. They may need to consider improving organisational performance through PKM and leadership styles. Different PKM may create different levels of organisational performance, and only certain PKM and leadership styles may be suitable in some situations. Therefore, top management may need to consider applying appropriate PKM and leadership styles to different situations in order to sustain learning in the organisation and to improve organisational performance as a result.

VII. Limitations and Recommendations

This research specifically investigated the healthcare industry in the Thai context; future studies are expected to be extended to take account of different geographical regions at both local and international levels, to widen understanding [67]. As highlighted by Hofstede [45], 'there are no such things as universal management theories'. This implies that perceptions which may be considered as 'appropriate' in some cultures may be considered 'inappropriate' in others. House et al. [46] also proposed that the country's Buddhist religion plays a vital role in shaping the culture of Thailand, showing that differences between cultures may lead to different findings. Hence, future research may need to consider extending the study to investigate different contexts with different cultures and religions. This could also involve classifying the different approaches with a more diverse sample on perhaps a larger scale, with different business sectors and business strategies.

For example, researchers may specifically investigate the approaches to PKM and leadership styles in organisations such as hospitals in different areas and cultures. This may help to acquire a deeper understanding of how each top management contributes to its organisation, allowing the researchers to identify particular techniques for transferring knowledge to and encouraging organisational members.

This research concentrated on the relationship between top managements' PKM and leadership styles, and organisational performance; this still leaves room to broaden the scope of research to account for other potential variables which may be associated with top management characteristics and organisational performance, such as the personalities of the managers or organisational cultures (see, for example, [46, 68-71].

Moreover, this research concentrates on a cross-sectional sample of one specific business type, which limits the degree to which the researchers can make causal references regarding hypothesised relationships. Alternative causes and effects may occur; for example, whether or not findings show that a greater number of employees may be correlated with organisational performance. Nonetheless, an organisation with a greater level of organisational performance may at the same time persuade skilful labours to collaborate with it.

Dependence on a self-reporting questionnaire suggests that the magnitude of relationships between variables may require further research. To a large extent, this is to facilitate the process of cross-checking the responses given and improve its validity. Additionally, for this research, only the respondents' perceptions of PKM and leadership styles and organisational performance were measured.

It is also recommended that future studies consider other groups relevant to the organisation, apart from top management. In this research, top management was specifically approached to complete the questionnaires, based on their perceptions. However, their accounts may not

be sufficiently comprehensive in understanding the contributions of PKM and leadership styles to organisational performance. It is thus strongly recommended to take into consideration the views of other potentially useful respondents from different positions for cross-checking purposes. More specifically, it may prove useful for future studies on organisational performance to include the views from a wider range of respondents other than the top management themselves, such as their organisational members.

Although this research is first of its kind in the Thai context, replication in the future may be valuable to help attain a better understanding of this industry and its prospects in the economy. The researchers may consider conducting a longitudinal study to assess and confirm the relationships between independent and dependent variables that were identified.

VIII. Conclusion

This research investigated the relationship between demographics, PKM and leadership styles and organisational performance. It aimed to provide greater understanding of the attributes of PKM and leadership styles useful for top management and to consider which of these PKM and leadership styles contribute towards organisational performance. Although the findings represent the implications of the relationship between top managements' PKM and leadership styles and organisational performance, there may be other variables which influence their translation into organisational performance (i.e. culture) as suggested by Hofstede [45, p.92].

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Economic Development Paradigm Influence on Performance Management Methods and Tools

Veronika Burešová, Lilia Dvořáková

Abstract—There is no enterprise management area which has not changed thanks to global economy development. Also the enterprise financial management is no different case. Still more intensive attention of academic and business sector is devoted to enterprise performance measurement and management. Performance measurement and management in accordance with strategic decisions – decisions about goals, strategies in an enterprise together with enterprise value creation and management is considered to be a key factor for the stakeholders which determines the competitiveness level of an enterprise in a long-term period. The target of this paper is to present the results obtained by qualitative research which was focused on mapping, identification, analysis and generalization of key changes in economic development paradigm and their reflection in financial management – specifically in enterprise performance measurement and management. The current shape and future development directions of concepts, methods and tools for enterprise performance measurement and management are discussed. The paper summarizes the results of a partial research within the project SGS-2013-40 „Paradigm of Development in the 21st Century and its Impact on the Behavior of Economic Entities“.

***Keywords*—**Economic development paradigm, enterprise performance, financial management, Value Based Management.

I. Introduction

THERE are a lot of phenomenons and tendencies determining the up to now development and form of macro environment – world economy and society [1]. The academic sector (as well as the professional public) emphasizes the phenomenons and tendencies connected with globalization and internationalization of the environment and with integration tendencies. So-called age of discontinuity has occurred since the 90´s of the 20th century – a turbulent time when the dynamism of changes and development is so high that it is impossible to predict the future state and direction of development based on the trends and events from the past. Thanks to the intensive development of information technology and means of communication, technical and technological progress the economic borders have been wiped and the barriers in motion and production factors "flowing" have been reduced to minimum across economies. We are going through the period of hyper competition when offer extremely exceeds demand for products and services of businesses.

Not only thanks to the increase of significance and boom in new technologies and systems (including information technologies) there has been digression from industrial society primarily based on transforming raw materials and natural wealth, inputs into outputs to knowledge society. Despite this the discussions and negotiations lasted many years before the economy model and business style in enterprise practice was put through and which would protect the natural wealth, capacity and variety of natural sources given to the mankind. On the international level in this matter an actual reaction came as far as in the 1980s when in 1987 the United Nations Committee for Environment and Development published a document which declared the support measures helping to "secure the needs of present generations without threatening to secure the needs of future generations without acting at the expense of other nations." [2].

As Fig. 1 demonstrates not only the macro environment but also the viewpoint on business and businesspeople is changing [3], [4].

This paper is one of the research outputs of the project "SGS-2013-40 Paradigm of Development in the 21st Century and its Impact on the Behavior of Economic Entities".

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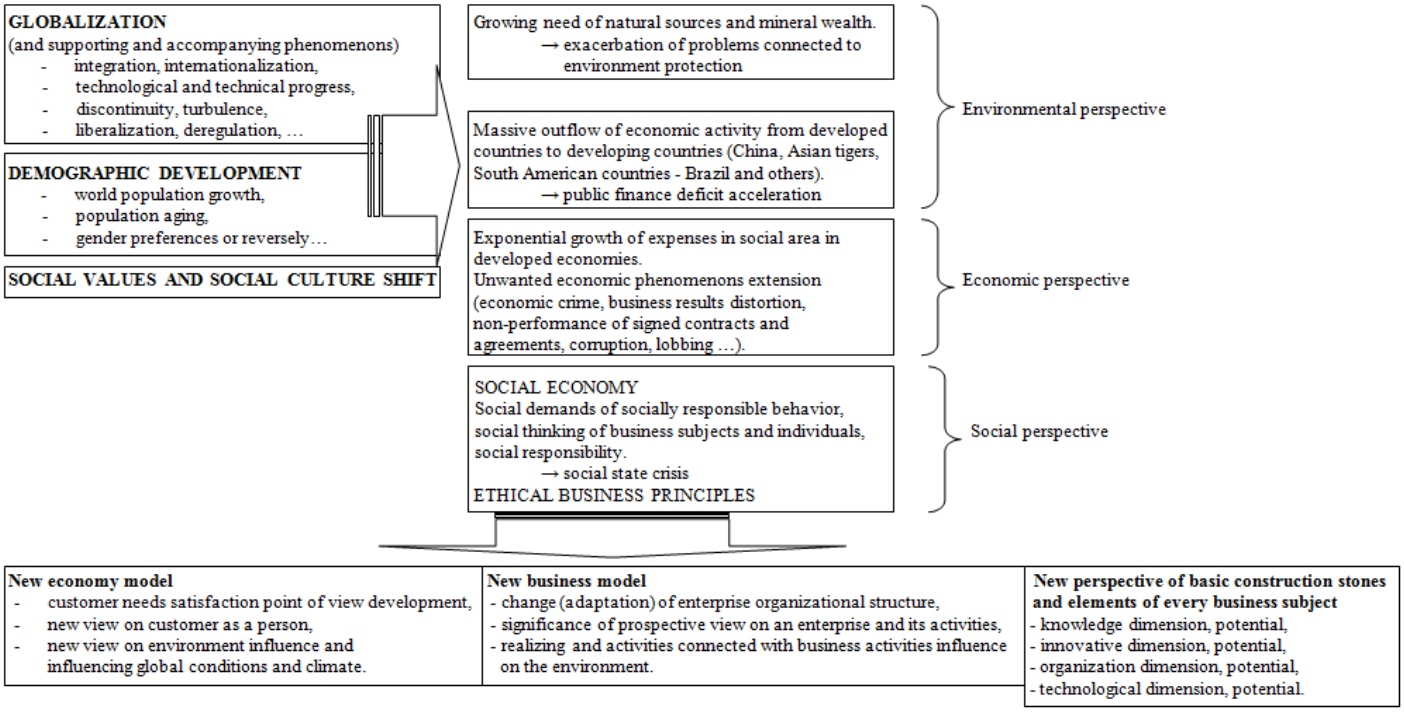

Fig. 1 Economic development paradigm changes impact on business and enterprise management in the last century
Source: own processing, 2013

Dynamic market development especially in the second half of the last century led most of the developed countries (economies) of the world to value oriented (consumption) society for which it was typical not to consider the business activities influence on the environment, workers (work environment) etc. The business subjects target and their priority was to make the maximum volume of production which led to overproduction. Then they tried to remove the overproduction by searching for saving measures, hidden reserves, introducing new technologies, new information system development which would enable increasing transactions speed, reducing the costs. In the 1980s the offer predominance over demand led to massive marketing techniques and tools development, more intensive perception of the customers, their needs and expectations. Quality, productivity, speed, customers' feedback and satisfaction started to be emphasized. On the contrary the 1990s were in the sign of still more intensive realizing of the good relations importance inside and outside the company which can be documented by following examples:

- building and strengthening relationships of an enterprise towards its suppliers, purchasers, creditors (banks and others – so-called inter-environment) etc.,
- creating positive relationships among workers, work motivation on enterprise results, identifying with company goals, elements of enterprise culture and ethics, functional enterprise organization, manager's personality – requirements about his professional and human qualities.

A great part of the last century was in the sign of state protective policies, communication and geographic barriers, there was not such a significant pressure on productivity increase, business activities economy and effectiveness, pressure to improve managerial methods and processes or costs minimization as it is happening at present.

We can recognize a few continuously strengthening tendencies in enterprise management development in the last few decades. At growing number of enterprises regardless their size or economical sector we can see the effort to:

1. improve communication and cooperation with the stakeholders of enterprise;
2. strengthen its ability to create long-term value for shareholders and other interested parties and subjects;
3. analyze strengths and weaknesses (internal potential) and identify areas which represent new opportunities or threats/risks;
4. increase operating effectiveness and reduce negative business impacts on environment;
5. create or further develop and elaborate enterprise sustainability strategies;
6. measure and report activities in sustainability area.

II. Problem Formulation

Business entities (public and private sector representatives [5, 25]) still more realize the necessity to plan, monitor, coordinate and manage the development direction of their business future – i.e. manage not only the present effectiveness

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(performance) but also their long-term performance (so-called competitiveness) [6].

One of the suitable concepts which can be used in this context is the concept of Value Based Management (further just VBM). It meets the expectations of all interested parties (not only the owner – the main business risk holder). The authors of this paper consider the VBM concept to be suitable for enterprise performance measurement and management in short-term and long-term periods although even the VBM concept is not flawless as is proved by experience from the end of the last century as well as the period of the last financial crisis when a major part of financial (often strategic) decisions was made according to predicted (often slightly manipulated) values of enterprise future performance.

This paper summarizes the results of the qualitative research performed in 2013 with the target to map, identify, analyze and generalize the key changes in economic development paradigm. The paper presents the key areas which are the top of interest of financial management. It defines the changes in enterprise financial management which were made in financial department thanks to economic development paradigm change. The changes in significance, roles and functions of enterprise financial management are illustrated – specifically the form and future challenges in the area of enterprise performance measurement and management concept, methods and tools. The potential of traditional and modern concepts, methods and tools for enterprise performance measurement and management is analyzed in details including their future development directions.

The results presented in this paper are based on qualitative research of literary and also electronically processed sources by academic sector and enterprise practice authors. Specifically they are monograph publications, research reports, professional studies, papers and review articles in professional magazines published to the topics of financial management and enterprise performance, specifically to value management within national and international framework.

III. Problem Solution

The importance, role and function of the enterprise financial department have significantly changed since the half of the last century. The financial department workers (financial directors, financial experts, financial consultants and others) have become much more important persons in the enterprise management – those whose activities considerably determine the success or failure of the business.

The results of the performed research which analyzed the development of enterprise financial department focus according to their changes in time are illustrated in following chapter III.A. It presents the changes impacts on financial management in economic development paradigm in the second half of the last century, specifically on performance concepts, measurement and management methods and tools in an enterprise. The results of the second half of the research are stated in chapter III.B. Its target is to summarize analysis results of current focus of traditional and modern concepts, methods and tools of enterprise performance measurement and management. Further on to suggest potential directions of their development in theory and also in practice in financial management and performance evaluation areas.

A. Financial Management

Financial management – financial economy and management although it is the key area of enterprise management and a determining element of enterprise success and competitiveness, it still does not have its stable and generally accepted definition and delimitation even at the beginning of the 21st century. The most often the financial management is understood as management of financial processes and cash flow in an enterprise. Process – its course and success is determined by four following consecutive, sometimes even mingling and also influencing activities:

- financial planning,
- financial decision-making,
- financial processes organizing,
- financial analysis and control.

Financial management of an enterprise is an area which penetrates all levels of business management – from strategic to tactical and even to operative. It includes following problem areas:

- Financial Accounting;
- Management Accounting;
- Controlling;
- Treasury Management (Cash Management, financing of business activities, company assets, cash pooling, capital management) and
- Enterprise performance measuring and management which gains still more importance.

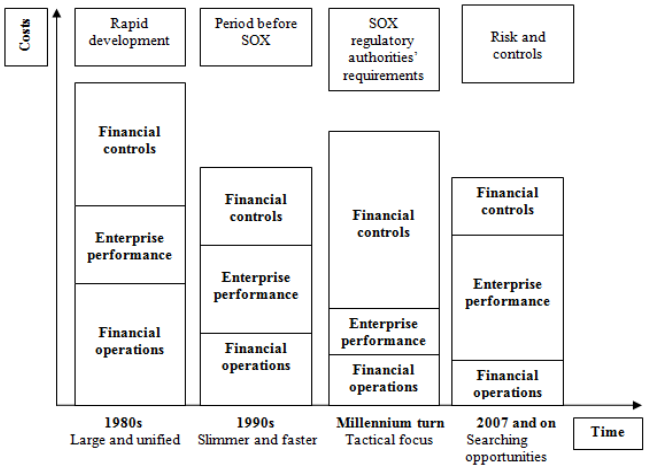

Fig. 2 Costs share development in main enterprise financial management areas in terms of time
Source: own processing according to [7]

Enterprise financial management provides methods and tools which document and help to quantify economic

phenomenons and events from past, over present to future. The most widely used ones are illustrated in following Fig. 3.

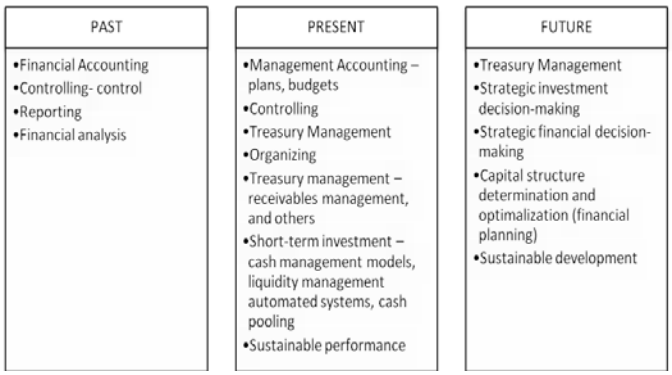

Fig. 3 Financial management areas focus in terms of time
Source: own processing, 2013

We can agree with the conclusions published in 2010 by international advisory company KPMG. In the presented report [7] KPMG states that the target of financial departments efforts in current economic conditions is to find a sustainable balance, an imaginary equilibrium. Thus, as Fig. 4 illustrates, to reach balance among controlling activity – controlling processes and mechanisms, strengthening of enterprise performance and reducing financial operations costs.

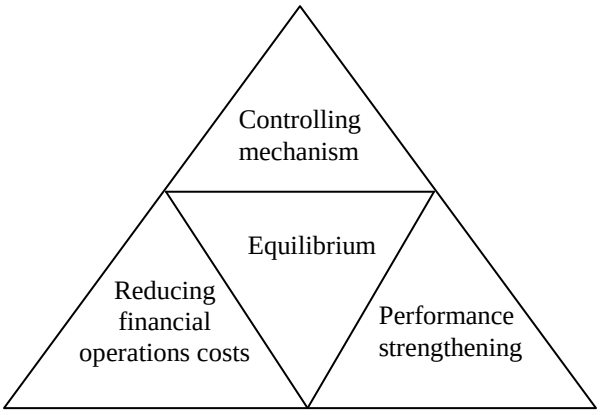

Fig. 4 Targets of enterprise financial department at the beginning of 21st century
Source: own processing, 2013

At the millennium turn not only the targets and functions of enterprise financial department but also the requirements laid on financial department workers – their professional side are changing (Fig. 5).

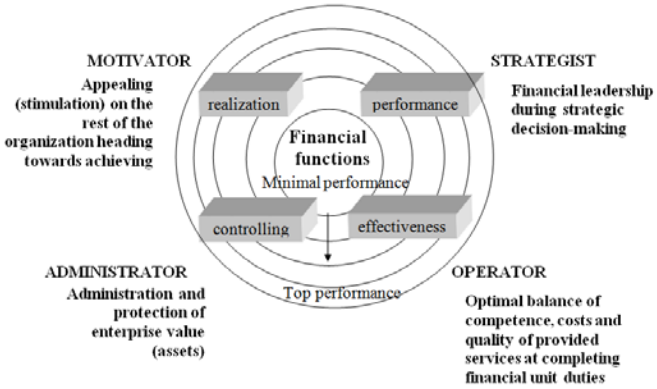

Fig. 5 Financial function role and requirements laid on financial managers
Source: own processing according to [8]

Although the financial management is a varied group similarly to business subjects to whom it provides methods and tools for monitoring and following financial economy management (optimization) we can identify a few similarities among enterprises across business lines in financial management area:

- Enterprise managers perceive the enterprise performance measurement and management methods and tools (financial management) as one of the factors which significantly determine the enterprise competitiveness.
- Despite the undisputable significance of financial management (enterprise performance measurement and management methods and tools) the enterprises are dealing with problems how to introduce economic information system which would provide correct, complete, in-time, customer-tailored information and data for enterprise financial or economic performance management as a whole and also its divisions, departments, workers, processes, operations and activities in a specific form and at the most effective and cheapest manner.
- Problems with formulation and subsequent enforcing of strategic decisions and completing the targets and strategies occur quite often. Targets are often interchanged with indicators.

However targets define just the direction, indicators already set an exact measurable form of milestones. One or more indicators can be matched to one target, in other words metrics or indicators. As [9] states performance measurement process includes creation of measurable indicators and their use in enterprise activity effectiveness and efficiency quantification, or for enterprise operative, tactic and strategic targets completion evaluation. Another suitable solution is so-called balanced evaluation on which e.g. the Balanced Scorecard [10] concept is based – balanced results cards and strategic maps.

Nevertheless in a lot of enterprises the external function based on statutory accounting, completing tax duties and obtaining external financing sources is still considered to have a dominant role in financial management. However such an approach prevents the financial units to become partners

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to other managers in decision-making because they are not able to provide information necessary for effective management.

B. Enterprise Performance Measurement and Management

The enterprise performance measurement and management researches performed in national and international framework [11] – [15], [22] - [24] resulted in conclusions that there is a wide portfolio of methods, tools, models, concepts and approaches whose meaning is to quantify and analyze enterprise performance development and current state.

Performance is researched from lot viewpoints:

1. Management level – strategic, tactic and operative performance [16];
2. Enterprise research range – enterprise performance as a whole [17], branches or divisions of the enterprise, departments, workplaces, workers, process;
3. Focus on produced performance – product, service, project [18], [19], process performance;
4. Focus on business subject type – production enterprise performance, services providing enterprise performance [20], performance evaluation with focus on banking sector [21], public sector [25] and state administration institutions [5];
5. Performance bearer – manager, worker, work group;
6. Management process realization stage – measurement, feedback, learning (or planning stage – analysis stage of use and need of indicators sets , scales, performance indicators, realization stage – stage of measurement, indicators, scales, performance indicators quantification, evaluation, feedback – reaction, request for a change indicators set, scales, performance indicators, improving the current state).
7. Focus on modern tendencies – sustainable business and sustainable performance.
8. Time – short-term, medium-term and long-term performance;
9. Evaluation way – performance indicator can be evaluated objectively (so-called scaling), subjectively (expert value evaluation), in a balanced way (detected value of performance indicator is evaluated in defined system of mutual connections and dependencies).

During enterprise performance measurement, evaluation and management we always assume that what we measure:

1. has the ability to complete defined targets
   - if the targets respect and correspond with the range of company activities – a company should be devoted to strictly defined activities which will complete its future targets;
   - if the targets respect and correspond with company activities adjusted to environment where the company is operating – requirement for knowledge of the environment and prediction, environment development and development trends prognosis;
   - if the targets respect and correspond with the range and structure of sources which the enterprise has or plans to have in the future;
   - if the targets respect and correspond with the values, expectations and targets of all who influence the selected strategy – the company is under pressure of suppliers, purchasers, competitive subjects, wide public, state and its authorities and offices.
2. is correct (expediency aspect).

We will restrict the following text only to concepts, methods and tools for enterprise performance measurement and management as a whole. The reason is that although authors use various terms they usually work with only one of the categories.

Financial theory in context with enterprise performance measurement and management focuses on several areas of this issue, looks for answers to following kinds of questions:

- Can traditional enterprise performance measurement and management concepts, methods and tools „survive“ even in 21st century economy conditions? Do enterprise performance measurement and management concepts, methods and tools still show a trustworthy enough picture of enterprise financial performance?
- Have the enterprise performance measurement and management concepts, methods and tools managed to adjust to new economic development paradigm?
- Can traditional enterprise performance measurement and management concepts, methods and tools compete the new concepts, methods and tools for enterprise performance measurement and management?
- Is the contribution of modern enterprise performance measurement and management concepts, methods and tools significant enough to substitute the traditional ones in the enterprise management use (see financial analysis)? [13], [23], [24].

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Table 1 Assumptions and benefits of enterprise performance measurement and management

Assumptions	**Benefits**
Focus on customer's needs and requirements	Understanding and adequate response to customer's needs, requirements and wishes.
Comprehensively formulated enterprise missions and visions which not only the enterprise management but also all the employees of the enterprise can identify themselves with.	Understanding the meaning of business and its future direction.
Transformation of business vision into goals and strategies which help to achieve the goals.	An employee confirms his importance, position and benefit for the enterprise – as every worker of the enterprise takes part at achieving the goals and results. Improving internal and external enterprise communication. Motivational factors. Enterprise as a whole is more result-oriented.
Focus on processes, key activities, operations and processes identification.	Production quality improvement. Elimination or outsourcing of activities/ operations/ processes which do not bring sufficient value.
KPIs setting.	

Source: own processing, 2013

IV. CONCLUSION

This paper is an analysis and generalization of knowledge acquired on the basis of qualitative research performed in the form of literary search, analysis and critical evaluation of available sources connected to enterprise performance measurement and management. The authors do not focus on an exact group of business subjects or a business area. The target was to summarize the key changes in economic environment which happened in the second half of the last century and the beginning of the 21st century. Based on the current form of economic development paradigm another target was to map and analyze changes in enterprise financial management.

The authors focused especially on enterprise performance measurement and management concepts, methods and tools. The modern approach to meaning, functions and tasks of this financial management area of an enterprise was introduced – thus the challenges which the business subjects perceive as one of the key factors in short-term effectiveness and long-term competitiveness of an enterprise.

In this paper the authors developed the idea that failure, problems and non-effectiveness of financial measurement and management (enterprise performance measurement and management) cannot be matched with insufficient amount or inperfect content of enterprise data and intercompany information but usually to:

- insufficient adaptation of economic information to enterprise needs,
- insufficiently accurate definition on quantitatively detectable and therefore well measurable value indicators.

Enterprises still more realize the necessity to manage the direction of their business future development – manage not only the present effectiveness (performance) but also their long-term performance (so-called) competitiveness) and not to be just a passive recipient but on the contrary and an active creator of events in economy. A suitable concept which can be used in this context is the concept based on enterprise value management – Value Based Management. Together with enterprise performance measurement and management and Balanced Scorecard concept business subjects across business areas and legal forms are assumed to be successful and competitive in a long-term horizon.

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Consumers' Resistance to Eco-innovations

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***Abstract*—**The globe is facing challenges regarding sustainability, such as climate change and depletion of scarce resources; this fact has indicated an urge for businesses to change their strategies. The innovation of green products has been a key strategy for market development. Regarding the consumer sensitizations towards environmental issues, this preference has failed to result in a green product adoption. So far, a significant technological development has taken place in the energy sector, the market diffusion of eco-innovations has remained at low levels. The objective of this study is to investigate the consumers' resistance to various eco innovative technologiesin Lebanonand identify the factors which are responsible for delay of its diffusion.The case of micro generations; innovative technologies which produce heat from renewable energy; where one domestic consumers' survey (n=50) of cross-sectional design was conducted, insisting on the fact that consumers still particularly resistsuch technologies and rely on conventional models. For the purpose of providing a better understanding ofthe reasons of consumers' resistance, the Innovation Resistance Theory has been employed. The results were analyzed using Cronbach's alpha for reliability and linear regression analysis which indicated that value and tradition barriers are critical factors for resistance.In this research, Solar Water Heaters (SWH), being one of various micro-generations, has been studied. However, further research for all types ofinnovative technologies which rely on renewable energy must be conducted in different Lebanese locations in order to find relation between consumers and various innovation characteristics and the steps towards eco-innovation adoption of such technologies.

Keywords: Innovation Resistance Theory, micro- generations, eco-inovations, Lebanon

I. INTRODUCTION

As the environmental challenges started to mount up and as the fact of natural resources depletion started to widen, both consumers and businesses became aware of environmental problems and various consumed or produced items.The fact of the increased need of households to require great amount of energy, as a result of more fossil fuel has lead to increase in greenhouse gas emissions as CO_2 (Green Line Association, 2007).Evidently, an urge towards preserving the environment and promoting alternative energy sources has occurred.

The (European Association of Development Agencies)considered eco-innovation as a tool to reduce environmental harms and contribute to economic growth, and a measure of relevant factors which introduce new ideas and products and reducing environmental burdens.Despite the marketing efforts to encourage consumers' investments in environmental innovations, the interest in such efforts remains low in developed and developing countries; this is what is referred to as resistance to eco-innovations. What derived my curiosity to perform this research are the electricity failures, increasing pollution, and rare consumers' adoption of eco-innovative technologies, which use renewable energy sources and have benefits on both environment and consumers, in Lebanon being one of the developing countries in the region.

Micro generations;which refer to the production of heat or very small scale, when in comparison to typical fossil-fuelled power station; share green innovations like hybrid or electric vehicles, green detergents with a similar destiny, where all of them lackedan important share in consumer markets(Bonini & Oppenheimer, 2008, p. 56). Despite their presence for decades, marketing of these technologies within consumer markets is still a new phenomenon.

The consumers' reliance on energy became dangerous on the environment, this fact stressed on the need to find a substitute for such energy. Renewable energy plays a minor role in the energy mix in Lebanon (Green Line Association, 2007). Hydro, wave, solar, and wind energy are all sources of renewable energydepending on rainfall and thermal plants productivity. Solar Water Heating (SWH), being one of several systems that rely on renewable energy,has been chosen in this research for the survey in order to provide a better understanding of households' behavior toward solar energy. Where SWH is a process of benefiting from the sun's heat energy to raise the temperature of water,it is installed on the roof of the house so that the flat plate solar collector can capture the sunlight and ensures that the heat energy captured remains within the solar collector and results in hot water.

Indeed, the SWH market in Lebanon has reached 18.1 million in 2011, with Mount Lebanon, Nabatieh, and Bekaa having the biggest shares among the eight governorates including Beirut where the North area lags far behind (Lebanese Center for Energy, 2012)

Consumers' resistance plays a significant role in the success of an innovation where it can either inhibit or delay the adoption, being termed as one of the major causes for market failure barrier of innovations(Ram, 1987). The objective of this paper is to build on recent findings and researches in the resistance literature, investigate their application in Lebanese market, and to investigate consumers' resistance towards eco-innovative technologies in the field of micro-generation in Lebanon. Thus, providing a better understanding of the resistance reasons in order to overcome this resistance problem and reach eco-innovation adoption in the future.

A. Problem of the Research

Over the past two decades, a greater attention regarding consumer resistance started to take place, yet fewer studies in academic literature field examined factors affecting such resistance and further consumers' perception (Park & Chen, 2007). There is a need to develop renewable energy in developing countries and result in a lasting consumption behavior bound with less pollution and greater awareness.

According to Jean-Paul Sfeir, the owner of Solarnet (Lebanese company dealing with solar supplies), the reason behind the fact that Lebanon still lags behind its neighbors is the high installation costs where the solar water heater typically costs between $1,487 of size 266 liters (Arab Sustainability Association, 2012) putting them out of reach for most Lebanese families. A sample of 500 households was studied and indicated that 2.8% only use solar thermal collectors for water heating either alone or with a backup system while 82% were found to use electricity, whereas Cyprus indicates 92% of households use solar technology(Houri & Korfali, 2005).With all the facts there is still resistance among consumers towards eco-innovative micro-generation in Lebanon. Indeed no previous studies of the Lebanese consumers' resistance to eco-innovative and various factors leading to such response, yet multiple studies of the energy figure were presented dealing with the energy efficiencies and solar water heaters

role in reducing bills. However, no significant clues were provided regarding the consumers' behavior, and various factors affecting their resistance, and after that adoption of eco-innovative products. As an example of those studies:(Green Line Association, 2007)(Houri & Korfali, 2005) (Lebanese Center for Energy, 2012). Based upon this, investigations of the factors which lead to resistance to those products should be considered.

The solar water heater market in Lebanon has also grown relatively quickly over the past five years; yet only 3% of Lebanese households have installed solar water heater systems, largely due to the absence of incentives and regulations that could promote It(Beheshti, 2010).

Although, there are an acceptable number of households adapting this kind of eco-innovations, there are still a fair number of those who still resist, and show low enthusiastic response to those eco-innovative technologies but without significant adoption behavior. So, it's important to understand the reasons of resistance from the resistance before studying the adoption view.

B. Research Question

There became a rise in need for better understanding the factors which lead consumers to resist new technologies, especially that of an environmental nature. However, the eco-innovation field is not well researched; this research aims to find these factors and barriers which lead to consumers' resistance, based upon existing literature, and current research. An innovation, indeed, may change consumers' day to day routines, and conflict with their prior belief structures(Ram & Sheth, 1989), which leads consumers to automatically resist without trying to deeply assess the new technology and its various benefits.In fact, the consumers' resistance became a critical barrier for companies aiming to promote eco-innovative products. However, consumer resistance is an under-researched area and empirical evidence about motives behind different types of resistance behaviors is scarce. Accordingly our research question is as follows:

What are the factors which can be considered responsible for determiningthe consumers' resistance to micro-generations (SWH)?

II. LITERATURE REVIEW

An understanding of the consumers' behavior and influential factors are a necessity in order to uncover the factors of resistance. Many studies were performed dealing with notion of consumer resistance (Gatignon & Robertson, 1989) where they studied rejection as a behavioral form, and (Penaloza & Prica, 1993) who classified consumer resistance as; organizational, goals, tactics of resistance, and consumer's relationship to marketing agents dimensions. Furthermore,the study of innovation adoption and the factors which speedup the adoption process(Roger, 1995), yet studying the process of innovation resistance may be even more important than studying adoption(Ram, 1987). Where both resistance and adoptions can co-exist during the life of an innovation(Ram & Sheth, 1989) thus several strategies for the purpose of overcomingsuch resistance and speeding up the adoption have to be employed. This study is trying to apply the Innovation Resistance Theory (Figure 1) to the context of eco-innovations, to check its application and validity on solar water heaters among Lebanese households.

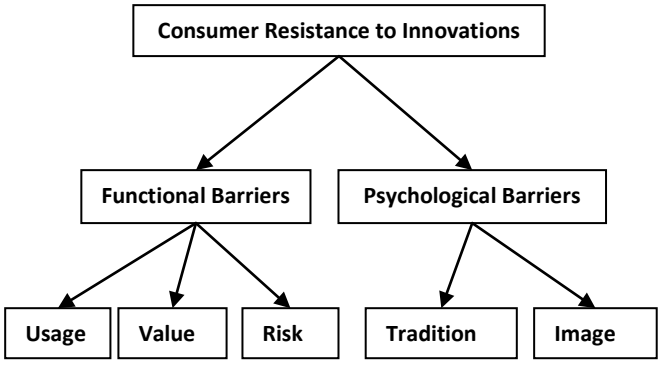

Figure 1: Innovation Resistance Theory

Currently, it is time of respecting consumers' resistance, understanding their psychology of resistance, utilizing this knowledge, and promoting innovations rather than thrusting preconceived innovations(Sheth, 1981).

Resistance of various types of innovations is defined as preventing consumers from potential changes, and the main structure element of the status being made up from either dissatisfaction or conflict with beliefs of consumers(Watson, 1971). Several researchers stated that the main reason for the slow diffusion or failure of innovative products is consumer resistance. Indeed, Understanding consumers' resistance to green innovative technologies, and their inner motives, is of great significance for the purpose of bridging the resistance towards eco-innovations. Some researches argued that green products can conflict with consumers' belief structures or daily habits and routines(Ram S. , 1987)(Ram & Sheth, 1989) (Bagozzi & Lee, 1999) (Szmigin & Foxall, 1998). For example, the (Faeirs & Neame, 2005) Investigated the attitude of householders towards solar systems and identifies some of the barriers to adoption such as the ambiguity of these products characteristics. In their study of residential heating systems (Mahapatra & Gustavsson, 2007) found that economic aspects and functional reliability were the most important factors for the homeowners when considering a new heating system rather than the current one.

Yet, no specific studies of the eco-innovation characteristics and that of the consumers' characteristics were conducted to explain the resistance phenomenon.(Kleijnen, Lee, & Wetzels, 2009)indicated three segments of resistance, starting with low resistance consumers those who didn't adopt but will purchase such innovation soon, those consumers have low functional and low psychological barrier. Medium resistance consumers, is the second level of resistance, are those consumers who postpone adoption and the main reasons behind this fact is not been fully convinced about the value and usage of the innovation. The Last resistance level is the high resistance consumers are those who completely reject adoption and are associated with poor image and higher functional risk of an innovation.

In addition, potentially successful eco-innovations may be rejected, becausethe product is considered in the minds of consumers to be new, complex and unknown (Alexander, John, & Wang, 2008). The findings of (Claudy, Michelsen, & O'Driscoll, 2011); which dealt with the diffusion of microgeneration technologies, indicated that the homeowners' willingness to pay is not primarily based on rational cost–benefit evaluations rather to be influenced by subjective perceptions of the technologies' characteristics, people's personal background and social environment. (Paladino & Baggiere, 2008)foundthat friends' encouragement was a significant predictor. Most of the studies in the field of consumer resistance are conceptual

in nature, where there is rarity of empirical evidence concerning the different resistance behaviors.

Ram's model of innovation resistance determined three sets of factors; Perceived Innovation Characteristics', Consumers' Characteristics, and Characteristics of Propagation Mechanisms. This model has been widely used for investigating consumers' resistance to different innovations(Roger, 1995).(Lee & Yu, 1994)modified Ram's model of innovation resistance where they excluded the characteristics of propagation claiming that is a barrier to diffusion of innovation from a social perspective rather than source of innovation resistance.

It was discovered by some researchers that the causes of resistance to innovation stem from one or more of the adoption barriers, such as usage, value, risk, image, and traditional barriers(Ram & Sheth, 1989). Consumer resistance to innovations consists offunctional barriers and psychological barriers, stated as Innovation Resistance Theory (Figure 1). Usage, value and risk barriers constitute functional barriers, whereas tradition and image barriers refer to psychological barriers. Functional barriers are likely to arise if consumers perceive considerable changes from adopting an innovation, while psychological barriers are often caused by conflict with consumers' prior beliefs(Ram & Sheth, 1989).The barriers for innovation resistance differ from one product to another; such model is applied to check the factors causing resistance to eco innovative technologies in Lebanon.

In reality, the Lebanese households'resistance towards the environmentally friendly products or green innovative technologies is critical where they might be so satisfied with their current equipment and resist following innovation and benefiting the environment.

C. Hypothesis

According tothe Innovation Resistance Theory and various researches of innovation resistance the following are proposed hypothesis to understand the consumers' resistance to eco-innovative generations, specifically micro-generations.

Starting with the functional barriers, the usage barrier is related to the usability of an innovation and the various changes it requires from the consumers. When such innovation tends to be incompatible with existing practices and habits, this indicates a current barrier (Ram & Sheth, 1989).

H_1: *The usage barrierdetermines the consumers' resistance to eco-innovative technologies.*

The value barrier is defined as the monetary value of an innovation. An innovation is not considered to be worthwhile for customers to change if it doesn't offer great performance to price in comparison to its substitutes (Ram & Sheth, 1989).

H_2:*The value barrier determines the consumers' resistance to eco-innovative technologies.*

The risk barrier that is the degree of risks an innovation entails. Such uncertainty in inheriting an innovation categorized in tophysical risk (described as a harm to a person or his property), economic risk (the cost of making wrong decision to adopt an innovation now instead of waiting for a better version), functional risk (the ability of an innovation to function properly) and social risk (social fear of being seen negative light by others) (Ram & Sheth, 1989).

H_3: *The risk barrier affects the consumers' resistance eco-innovative technologies.*

The second part of the theory deals with psychological barriers which contains, the tradition barrier is classified as the change that an innovation may cause in the daily routines of a consumer. Such changes might be important for consumers or not, since they also has family values and social norms which are taken into consideration (Ram & Sheth, 1989). Where they classified tradition and image barrier, the first occurs when consumers' behavior tend to contrast these this leads to tradition barrier

H_4*: The tradition barrier determines the consumers' resistance to eco-innovative technologies.*

While the second, the image barrier,is based upon stereotyped identity of innovations, as the country of origin or the brand of an innovation.. This barrier is in this case the innovation itself.

H_5: *The image barrier determines the consumers' resistance toeco-innovative technologies.*

III. METHODOLOGY

As discussed earlier, the study was performed to investigate various factors which cause consumers' to resist eco-innovative technologies. So, a face to face survey was conducted with Lebanese households and a five point Likert scale ranging from strongly disagree (1) to strongly agree (5) was conducted to be answered through a quantitative method. The questionnaire was performed with a sample of 50 households in North Lebanon, and the collected data was further analyzed through descriptive statistics and SPSS for analyzing quantitative data.

For the purpose of distinguishing between users and non users of SWH; the convenience non probabilistic sampling was chosen where participants were selected in convenience with the topic under study.

It is important to check the available approaches to serve as a basis for research design. The deductive research approach is applied where the hypothesis is tested in an appropriate objective way, utilizing driving factors of Innovation Resistance Theory to understand the consumers' resistance to eco-innovations. Upon theoretical and empirical findings, this research aims to better refine the previous Innovation Resistance Theory in regards to eco-innovative technologies.

The questions were designed in an easily understandable manner and performed on a number of days from different locations in the city to govern the credibility and variety of sources. Moreover, the secondary data applied were mainly obtained through websites, research articles, and journals.

IV. RESULTS AND ANALYSIS

After the data was collected, the analysis of collected results has arrived to present values for each factor. Through the analysis of data collected from survey which covered five resistance barriers; namely usage, value, risk, tradition and image barriers, the results tend to present 54% males, 46% females, 34% of those are aged between 35 years old and 55 years old, among the 50 households surveyed only 4% of them had SWH this value was deducted from analysis to just focus on those who resist such innovation (Table1). Moving away from demographic factors, the results showed that 64% of households valued the notion of saving environment, yet only 40% knew that SWH reduce the green house gasses emissions.

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Table 1: Demographics

Characteristics	Category	N	%
Gender	Male	27	54
	Female	23	46
Age	26-35	11	22
	36-55	17	34
	Greater than 55	10	20
	Other	12	24
Yearly Family Income (U.S Dollars)	Less than 15,000	4	8
	15,000-25,000	31	62
	25,000-35,000	12	24
	Greater than 35,000	3	6
Owning SWH	Yes	2	4
	No	48	96

The assessment of reliability was expressed by the Cronbach's alpha values which revealed usage, value, risk, tradition, and image barrier with the following scores being 0.710, 0.671, 0.649, 0.690 and 0.689respectively. Furthermore, reliability level for these variables is 0.691, and multiple regression equation was used for providing better analysis for independent variables stated above. The multiple coefficient of determination; R square is 0.483, thus indicating that 48.3% of variance in the variable consumers' resistance is explained by the model. The linear regression results are shown in (Table 2).

Table 2: Linear Regession

Variables	Beta	p	Condition Index (CI)
Value Barrier	.740	.000	16.253
Tradition Barrier	.280	.025	5.146
Usage Barrier	.254	.045	8.576
Risk Barrier	.047	.682	5.424
Image Barrier	.011	.926	6.832

The linear regression analysis indicated that the highest Beta value is 0.740 for value barrier, and second highest is 0.280 for tradition barrier, and 0.254 for usage barrier where both independent variables are significant of 0.000, 0.025, 0.045 respectively since the Sig. value is less than 0.05, while risk, and image barrier of beta coefficient, 0.047, and 0.011 respectively. Moreover, the last two values are not statistically significantbecause they have sig. value above 0.05.
The condition index has been calculated in order to check for the co linearity problem. All the CI values for the five barriers are below 15; instead of the value barrier being slightly above 15 reveals that this study has no serious problem with co linearity.

Therefore, H_2 and H_4 representing the value, and tradition barrier moderately are highly supported, whereas H_1 which represents the usage barrier is moderately supported showing a moderate effect on consumer's resistance.This study referred to (Ram & Sheth, 1989)research regarding the classification of psychological and functional barriers, the gathered resultspoints thatvalue barriers determine the consumers' resistance to solar water heaters which are part of eco-innovative technologies. This indicates that there is still doubt about the ability of such innovations to control their financial matters, where households still don't value solar water heater's performance to price paid. This aspect was in line with (Claudy, Michelsen, &O'Driscoll, 2011) Moreover, those households are resisting such eco-innovations for their belief that their current conventional used technology for water heating is quite satisfactory, and the price of solar water heaters doesn't meet their performance.This also reveals what(Kleijnen, Lee, & Wetzels, 2009)dealt with stating medium resistance consumers who are not completely convinced and resist innovations for value barriers. However, the other two functional barriers where the value barrier was proven to have moderate effect, yet the usage barrier weren't proven.The first barrier dealt with the social aspect where consumers' resistance didn't appear as a fear from appearing to be negative in the eyes of neighbors and surroundings. The second barrier which is weakly supported is the usage barrier, determining that compatibility doesn't significantly drive households but has a certain impact on consumer resistance to solar water heaters, where there are other severe factors which cause such decision.

These results show moderate similarity with (Mahapatra & Gustavsson, 2007)(Alexander, John, & Wang, 2008). Thus, the above researchers dealt with usage barrier, being explained as the product's reliability and complexity. Yet, the survey didn't include the economic risk which might have a role in resistance since many consumers wait for a better innovation and more reliable one.

On the other hand, the image barrier; being defined as a psychological barrier; which deals with the country of origin or brand name, didn't appear to have a moderate effect on resistance. Since, consumers don't resist solar water heaters for the fact of the brand name, yet for underlying facts which might deal with lack of promotional campaigns and awareness, or unmet performance. When the consumer's behavior tends to contradicts his/her social norms and family values, exists the tradition barrier which is the case of solar water heaters, being supported in this research. Similarly speaking, the current lifestyles tend to become with time hard to change. As most people got used to certain acts and products, that family uses frequently, thus leading to resistance of any new product or innovation since it will contradicts the norms. Thus indicating similar results of (Watson, 1971)who stated that resistance to innovation is caused by its conflict with consumers' beliefs, in addition to daily routines, and habits, friends, and regular purchases decisions. (Bagozzi & Lee, 1999)(Ram & Sheth, 1989), (Szmigin & Foxall, 1998)(Paladino & Baggiere, 2008).

V. CONCLUSION AND FURTHER RESEARCH

Through the application of Innovation Resistance Theory dealing with the classification of functional and psychological barriers, the current research discussed the Lebanese households' refusal towards eco-innovative technologies, Solar Water Heaters, representing micro generations, being chosen to perform small study upon.
According to the research data, the value and tradition barriers play an important role in affecting consumers' resistance to solar water heaters. The value barrier is considered part of thefunctional level barrier, while the tradition barrier is part of thepsychological level barrier.Indicating that the consumers' may still believe that their current traditional means are providing them with suitable return, in addition to their beliefs that solar water heaters are still not that reliable or of performance up to the perceived level.

This study should be reconsidered in a wider perspective where a larger sample should be studied in different locations in Lebanon, of qualitative method followed by quantitative one in order to provide a deep understanding of consumers' behavior.Therefore, this study recommends a government, private sector, and local Non-Governmental Organizations to develop the field of renewable energy in Lebanon through enhancing, promoting, and supportive legislations.

Although this research stressed on functional and psychological barriers of consumers' resistance to eco-innovative technologies quantitatively, there should be further qualitative in depth analysis for

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better understanding the factors determining such behavior. Further research should be performed for testing relation between socio-demographic variables and awareness of green innovative technologies, and the accurate cognitive involvement of consumers, with a wider stress on the diffusion of the eco-innovation adoption, as well as dealing with longitudinal approach in order to provide wider unrevealed characteristics. Such findings will be a tool for marketers to raise awareness and stimulate higher interest for new technologies of environmental aspect.The study was performed among one category of micro-generation for the limitation of time, and money, yet this research will be followed by a study which will deal with several types of micro-generations to assess objectively the barriers and develop a strong base for implementing. In addition to draw up the relationships between consumer and eco-innovation characteristics to be as a building block for the application of adoption process in the field of micro-generations not only SWH but also other kinds of micro-generations.

This research paper will be used as a building block for further studies for the purpose ofincreasing interest inthe field of eco-innovations, and drive Lebanon to become among the countries which highly use such innovations. Moreover, we should take in to consideration the financial aspect of this phenomenon. Since one of the factors affecting the resistant behavior is related to the monetary aspect, there should be certain incentives and regulations in order to accomplishthe desired results. In other words, a deep study of how could any kind of incentives; such as state backed financing,provide a solution for the resistance to eco-innovations. The next study should provide a clarification of how the government and the commercial banking sector can contribute in a national financing mechanism, thus boost the adoption of eco-innovations and increase the current number of usages in Lebanon. Therefore, combining both the right promotional mechanisms and the suitable financing covering will lead to the desired objective; that is Lebanon among green economies.

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Process documentation on a successful disaster risk management program in a flood prone area in Sri Lanka

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***Abstract*—** In the year 2011, the flood recovery project was implemented by CARE International, in Sri Lanka, during the worst reported flood in the recent past. This paper is focused on the process of establishing a village level disaster risk management model, implemented in response to the floods experienced. It was developed with a sustainable and community based approach involving villagers and all responsible stakeholders, based on the disaster risk reduction program implemented in this flood-prone area of the eastern part of the island. The process can be replicated in similar settings.

***Keywords*—**Community based disaster management model, Disaster risk reduction, Flood recovery

I. Introduction

Sri Lanka, being an island, in the northern part of the Indian Ocean, is highly prone to monsoon winds and convection currents leading to a high level of annual rainfall throughout the country. In the past, water storage cascade systems were developed to store water, in the dry zone of Sri Lanka. These systems included large tanks, small tanks and a network of canal systems spread across the dry Zone [1]. In the recent past the weather patterns have changed significantly causing severe damage to people, land, agricultural production, livelihoods and wild life. Even in the past in 2008, Batticaloa District was the highest affected by floods while Ampara and Polonnaruwa Districts were also affected [2].

Due to unusual weather patterns and the resulting consistent heavy rains, severe floods occurred in many parts of Sri Lanka during the period from January to February in year 2011. This was the worst ever floods since year 1957 in terms of its adverse impact according to an assessment carried out by the meteorological department together with the Disaster Management Centre (DMC) of Sri Lanka. The most devastating floods that had battered the Eastern coast of Sri Lanka and caused great destruction in most parts of the island had cost the emerging economy nearly 30 billion Sri Lankan rupees (or US $ 27 million) [3]. Worst affected were Ampara and Batticaloa districts of the Eastern Province and Polonnaruwa district of North Central province. Heavy rains, landslides, and strong gusty winds continued to devastate several districts in Sri Lanka, with a looming danger of an outbreak of water-born epidemics. The floods have inundated 200,000 acres of paddy lands in the five major paddy cultivating districts and it was estimated that rice harvest in the next season may go down by over 360,000 tons. In the three districts of Anuradhapura, Batticaloa and Trincomalee 200 Tanks and reservoirs had been damaged and another 300 were reported to be in critical conditions [4].

The flood damage occurred due to three main reasons as follows;

a) Unusually heavy rain-fall to the districts and surrounding areas.
b) Breaching of spillways and bunds in minor tanks and channels unable to withstand heavy pressure.
c) Opening of sluice gates in large tanks to slow release excess water as a safety precaution to avoid a greater disaster which might have resulted if the dams were ruptured.

A. Severity of Damage

According to the DMC and other sources, many families were displaced to special government camps set-up during the peak days of floods. Thousands of houses were either fully or partially damaged. Large acreages of paddy cultivations and other field crops (OFC) which were about to be harvested were destroyed and a large number of livestock and poultry were also killed.

Adverse effects were experienced by families and individuals due to the floods and severe damage was done to agriculture and infrastructures by these floods as indicated in detail in Table I.

More than one hundred people either died, or, were injured or went missing due to the floods during this time in the three districts concerned; Batticaloa, Ampara and polonnaruwa, while severe crop and agricultural destruction also happened (Table I).

This paper is based on the work of the Flood Recovery Project; an emergency and recovery response project implemented in Sri Lanka by the CARE International Sri Lanka, financially supported by CARE USA. G. D. D. T. Jayawardene, is with the CARE International Sri Lanka, as the Director of the Flood Recovery Program. (phone: +94773407255, +9437-2281688; e-mail: tjayawaedhana@co.care.org, thusithajayawardene@gmail.com).

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TABLE I
SUMMARY OF THE MAJOR IMPACT FROM THE 2011 FLOODS AND HEAVY RAIN

Description	Ampara District	Batticaloa District	Polonnaruwa District
No. of Affected Families and Persons	Families : 116,944 Persons : 445,473	Families : 143,352 Persons : 533,837	Families : 7,880 Persons : 29,589
No. of Houses Damaged	Fully : 2,484 Partially: 14,712	Fully : 5,933 Partially: 12,015	Fully : 553 Partially : 2,557
Crops Destroyed (in acres)	Paddy: 123,803 Vegetables:1,811 Other crops: 6,388 Home garden: 5,446	Paddy: 115,002 Other crops: 25,370	Paddy: 86,062 Home Garden: 4,575
No. of Livestock Killed (poultry, cattle and goats)	Animals: 21,310 Poultry : 222,864	Animals & Poultry:199,506	Animals: 14,120 Poultry :167,330
No. of Deaths and Injuries	Deaths : 13 Injured : 57 Missing: 03	Deaths : 22 Missing: 01	Deaths: 05 Injured: 01 Missing: 01
Damage to Infrastructure	Canals : 831 Medium and minor tanks : 88 Sluices : 115	Major tanks : 10 Medium tanks: 12 Minor tanks :118	Minor Tanks: 47 Canal: 24 Road: 15

B. Adverse Impact

Land route accesses from many villages were breached resulting in isolation. Public utilities and service provision collapsed, physical infrastructure was damaged and school education was disrupted. Thousands of school children lost their school bags, books, uniforms and other utensils due to the force of flood water. As a result of cultivation and crop damage, thousands of families lost their means of livelihood and job opportunities.

Given the scale and extent of the flood damage, there was an urgent need for intervention in all three districts. CARE Sri Lanka responded to this dire need by immediately intervening to assist the affected communities through an initiative named the Flood Recovery Project (FRP).

The FRP is a short term recovery project, which consisted of four major components namely Cash for Work, Livelihood Support, Shelter Assistance and Disaster Risk Reduction.

Thus, the objective of this paper is to explain the implementation process of the Disaster Risk Reduction component of the Flood Recovery Project and the process of establishing a community based disaster management model.

II. DISASTER RISK REDUCTION PROGRAMME (DRR)

Several development agencies and nations across the globe are now committed to minimize the effects of the natural disasters on communities, to reduce injuries and loss of lives, property and environmental damages and the social, economical disruption caused by extreme natural events. There are a number of ways to achieve this goal. One approach that is the most important, standing as the foundation for all others, is the creation of disaster- resilient communities. Recent approaches in disaster management in different countries are based on a shift in the prevailing emergency management framework to disaster risk management, which calls for proactive disaster management activities with the local communities having to play a key role.

The main objectives of the DRR intervention are; (i) to reduce the vulnerabilities and increase capacities of vulnerable groups and communities to cope with, prevent or minimize loss and damage to life, property and the environment (ii) to minimize human suffering, and (iii) to hasten post-event recovery backed-up by detailed pre-event planning.

Community participation has been recognized as the necessary element to reverse the worldwide trend of increasing losses from small to medium scale disasters. Even though national, provincial or local level authorities have an important role to play, it is the communities at the grassroots level that matters the most [5]. Experiences and practices in community based disaster mitigation show the positive impact of the participatory approach to disaster mitigation. Involvement and participation of the local communities in disaster reduction programs receives the highest priority in the present approach as they are affected by the disaster, and more importantly, they are the first responders to the event. Irrespective of the scale of the event, it is the community, which suffers its adverse effects. In absence of any specialized skills, they rely on traditional coping and survival mechanisms to face and respond to the event before they start receiving any outside help.

Thus, the FRP contributed to enhance community capacity to prevent, cope with, mitigate and respond to disasters through formation and strengthening of village level disaster management committees (VDMCs) and to facilitate these committees to get the community acceptance to involve in emergency and DRR activities.

III. DISASTER RISK REDUCTION (DRR) IMPLEMENTATION PROCESS

A. Project Location

In order to select two (02) appropriate *Girama Niladhari* (GN) divisions (the government administrative structure at village level)/ villages for the implementation of DRR programs in each of Ampara, Batticaloa and Polonnaruwa districts, CARE conducted orientation programs to the Government of Sri Lanka (GoSL) officers, and several consultative meetings to coordinate with relevant GoSL Departments such Disaster Management Centre (DMC), Government Agent (GA) and Divisional Secretaries (DS). Simultaneously, CARE staff also involved in field assessments to identify the most disaster-prone GNs / Village in the above districts. Thus, the following GNs/ Villages were nominated by relevant DS with the recommendation of District DMC for the implementation of DRR programs as indicated in Table II.

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TABLE II
SELECTION OF PROJECT LOCATIONS

District	DS Division	GN Division	GN / Village
Ampara	Damana	18th Colony	18th Colony
	Akkaraipattu	Akkaraipattu-06	Akkaraipattu-06
Batticaloa	Pooraithevuppattu	Vellavely	Vethuchenai - Naathanai
	Pooraithevuppattu	Raanamadu	Poochikkoodu – 16th Colony
Polonnaruwa	Welikanda	Mahindagama	Kurulubedda
	Dimbulagala	Pahalayakkura	Pahalayakkure - 223

Based on the extent, village setup and disaster context of nominated GN divisions, either the whole GN division or one to two villages (adjoining and connected by land) in the GN division were chosen for the DRR implementation.

B. Activities

Once the project locations were finalized, DRR implementation was launched in all 3 districts. These activities were carried out in two phases.

IV. PHASE I

The following steps were carried out under Phase – 1;

A. Secondary Data Collection

Using a common data collection template, village level secondary information relevant to the disaster was collected from different sources such as GN, *Samurdi* Officer, DS office planning unit, Department of Agriculture and DMC. This information was further validated with the support of Community based organizations (CBOs) and key informants of the village.

B. Village Leaders Orientation

After the secondary data collection, village leaders' orientation was conducted in all project locations. CBOs, religious leaders, youth club members, rural development society (RDS), women's rural development society (WRDS), development committee members and other leaders were given a comprehensive orientation about the DRR activities of the Flood Recovery Project. GNs and DMC representatives also gave an orientation on GoSL's role on DRR.

C. Community Orientation and Formation of VDMC and Community Disaster Response Teams (CDRTs)

Following the village leaders' orientation, a community orientation was organized in every project location to get the maximum community participation for a sustainable DRR program. Communities were mobilized with the help of village leaders. A similar orientation was given to the entire community. Village leaders, GNs and DMC representatives also participated and explained their roles and future activities in collaboration with CARE to the community.

Once the orientation was given, village level disaster management committees (VDMCs) were formed in order to streamline the disaster management practice of the community. A main focal committee was formed at each village / GN level, named as the Village Disaster Management Committee (VDMC). Under the main body of the VDMC, four other committees called the Community Disaster Response Teams (CDRT) were also formed in each village / GN. Thus, a total of five committees were formed for each village/GN. The VDMC consists of 10 -12 community members chaired by the *Grama Niladhari* (GN). Four other members of the VDMC were nominated as team leaders of the four CDRTs of the same village/GN. Thus, the CDRT leaders are represented in the VDMC.

The four CDRTs were further given separate roles and were titled in the following way;

a. CDRT – Early Warning and Coordination
b. CDRT – Search and Rescue
c. CDRT – First Aid
d. CDRT – Camp Management

Considering the nature of the role that each CDRT entails, four to eight community members were nominated for each CDRT, as members. (Some of the VDMC members may also represent the CDRTs.) This structure was replicated in all villages concerned, in order to have a consistent setup throughout District.

D. Hazard Vulnerability Capacity Assessments

Hazard, Vulnerability and Capacity Assessment (HVCA) is an assessment methodology which is applied to contribute to a greater understanding of the nature and level of risks that vulnerable people face, where these risks come from, who will be the worst affected, what and how much the existing resources to be utilized to face disasters and what initiatives can be undertaken to address their vulnerability etc. The HVCA process involves collecting, analyzing and systematizing information in a structured and meaningful way, which can then be used to diagnose the risks community faces, the capacities they have and what activities can be taken to reduce people's vulnerability by building their capacities.

Under the DRR program of the Flood Recovery Project, HVCAs were conducted in each target locations to address the elements of disaster in each GN/Village. Each HVCA took nearly two days in the field depending on the level of community participation. Another one week is required to convert it into a report format, as it involves a lot of validation. The community was mobilized for this purpose. A few groups were formed among the participants based on age, their job, position in the society etc. Then, each group was assigned one or two Participatory Rural Appraisal (PRA) tools, fitting to the group, facilitated by the CARE staff.

The followings PRA tools were applied to collect the required information;

1. *Social map*: The spatial distribution of all the physical structures of the community
2. *Hazard map*: the spatial distribution of all the potentially dangerous occurrences within the community
3. *Resources map*: spatial distribution of all the resources which can be used to reduce the disaster risk
4. *Transect walk*: collecting the information via direct

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observation by looking, listening and feeling about hazards, vulnerabilities and capacities

5. *Key informant interviews*: collecting information from important people who are aware of the main hazards, especially, in relevance to the topic
6. *Focus group discussions*: collecting information from a selected group who will represent the whole community
7. *Venn diagram*: understanding the present contribution by all the stakeholders of the community
8. *Seasonal calendar*: when the particular disasters occur throughout the year
9. *Pair wise ranking*: ranking the disasters based on the impact and intensity
10. *Problem tree*: Understanding the cause and effect relationship of a disaster
11. *The annual activity calendar*: the annual routine activities of the community
12. *Historical timeline*: the disasters which had an impact on the community before

E. Disaster Management Plan Preparation

Following the formation of disaster management committees and HVCA in each village, CARE assisted the communities to develop their own disaster management plan that fits into their context, in local languages. Based on the findings of HVCA, half a day was spent to prepare a disaster management plan with the participation of the community for future operations. The plan covers the basics of major disasters that happen in the area, activities to be undertaken to mitigate the disasters, budget allocations, responsible person or agencies for each activity, long term and short term needs and other relevant information. However, these Disaster Management plans were further verified with the DMC and the community members.

V. PHASE II

With the strong base in the field, experience and the knowledge gained throughout the Phase I the rest of the activities were directly carried-out in the Phase II.

A. Creation of Community Level Awareness on Disaster Risk Reduction (DRR)

It was observed that the awareness in the selected communities about various types of disasters, causes of disasters, preparedness against disasters and their prevention was very much less. Thus, it was decided to conduct three types of disaster awareness programmes matching their context and requirements in five GN divisions in the three districts of Ampara, Batticaloa and Polonnaruwa. Adult teaching methodology was used to conduct the programmes.

Three types of disaster awareness training programmes were conducted as follows;

a. Awareness on the basics of Disasters and Preparedness

The community was educated on the basic types of disasters, how disasters occur naturally, how humans are responsible for disasters directly or indirectly, greenhouse gasses, global warming, climate change, disaster preparedness, importance of community level actions to mitigate and prevent such disasters in the future, in anticipation of cyclic disasters what can be done in the event of a disaster and about the government structures and mechanisms relevant to disaster risk reduction (DRR).

b. Awareness on Human-elephant Conflict

The objectives of this awareness programme were;

- to educate the community on;
  - the basics of human-elephant conflict
  - how to prevent life, property and livelihood damage from elephant attacks,
  - prevention mechanisms using natural resources,
  - positive and negative effects of erecting and maintaining electrical fencing systems,
  - basic legal aspects of wild elephant protection and conservation,
- to set-up an early warning mechanism,
- to educate on effective usage of jumbo crackers and flares to chase elephants away followed by a practical demonstration,
- to provide names and telephone numbers of officers of the Wildlife Department to contact during an elephant attack to obtain immediate advice and redress.

c. Awareness on Dengue Prevention

The basic objective was to educate communities on the prevention and the spread of dengue.

B. Capacity Building of Village level Disaster Management Committees (VDMCs)

As per the Disaster Management Act-13 of 2005, the Village Level Disaster Management Committees (VDMCs) needed to be registered as autonomous organisations under social service act and operate under the supervision of DMC. For this purpose, VDMCs had to have a constitution, generate their own funding, maintain records and financial statements and conduct their operations in a transparent manner whilst implementing programmes under its purview. This phenomenon is rather new to the community members. Thus, CARE had to build their capacities by providing the necessary exposure and training in order to empower them to undertake these tasks.

VDMC is a new concept and somewhat difficult to be comprehended by the communities who are used to the traditional way of operating without any written constitutions or records. In spite of this draw back, a few VDMCs had already been established and were operational in some areas, by that time. Therefore, CARE intervened to take the in-experienced VDMC members to visit two such operational VDMCs in the Ampara District. Through these cross visits VDMC members were exposed to these processes and were able to familiarise and learn how to set-up and register VDMCs, and carry-out their functions independently. Both men and women from these communities and VDMCs, participated in this cross visit.

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Thereafter, CARE initiated them to further undergo a two-day training programme to improve their leadership skills and financial record keeping techniques. This training also covered aspects such as; writing a set of norms and how to prepare a constitution, developing a community based disaster management system, tips for effective leadership, raising funds, keeping records, maintaining financial statements and maintaining financial sustainability. They were also trained on soil conservation methods and other relevant knowledge areas. These programmes were conducted in selected six communities with the participation of male and female members.

C. Capacity Building of Community Disaster Response Teams (CDRT)

The purpose of forming CDRTs is to have different functional teams to respond to any emergency situation or disaster that may arise in the community. Under the leadership of each VDMC, four CDRTs were formed comprising of eight to ten members.

Each CDRT has a particular function to perform under disaster management. The four CDRT functions are as follows;

i. First Aid
ii. Search and Rescue
iii. Early Warning and Coordination
iv. Camp Management; emphasising on Water and Sanitation

Above functions require special skills, which are new to the community members. Therefore it was necessary to provide specialised training to build their capacities to take the leadership in any emergency situation in their communities. With this objective, CARE provided the required specialised training needed by the four teams. Under this, four types of trainings were conducted as indicated in Table III. These training programs were important to carry-out the responsibilities of the VDMCs and CDRTs.

D. Capacity building of Government Officers on Disaster Management

Whilst building the capacities of the communities it was felt that the capacities of relevant Divisional Level Government Disaster Management officials also needed to be strengthened. Since they constantly interact with communities, this would increase the disaster management capacity of both groups enabling them to interact effectively. Thus, CARE decided to build the capacities of officials attached to the Divisional Level Disaster Management Committee by conducting relevant training programs.

Six such training programs were conducted for both men and women officers, covering the following subjects; disaster management act, basic concept of disaster management, climate change, importance of disaster preparedness, first aid and camp management.

TABLE III
TRAINING PROGRAMS ON DISASTER AWARENESS

Training Topics	Contents of Training
First Aid	• Principles of First-aid • First-aid for children, infants and elders • Lifting, carrying and transporting injured victims • Eye injuries and foreign bodies in the eyes • Snake bites and wild animal attacks • Poisoning and burn Injuries • Fractures, dislocations and joint injuries • Dressings and bandages • Unconsciousness, fainting, fits and convulsions • Cardio Pulmonary Resuscitation
Search and Rescue	• First-aid and Management • Concept of Rescue • Basic Navigation Techniques • Ropes and Knots • Basic Search and Rescue Procedures • Fire Rescue • Personal Protective Equipment (PPE)
Early Warning and Coordination	• National level disaster early warning system - focal point DMC • District level disaster early warning system - focal point District Secretariat • Divisional level disaster early warning system - focal point Divisional Secretariat • Grama Niladhari (GN) level disaster early warning system; GN being the President of VDMC • Developing a '*top to bottom* and *bottom to top'* communication system covering an entire GN division • Types of disaster early warning systems
Camp Management	A. Evacuation, Setting-up and Administration **a)** Evacuation to a Safe Location • Conditions of a safe location • Conditions of a safe evacuation route • Evacuation procedures **b)** Basic Requirements of a Camp Site • Security • Administration / coordination • Accommodation • Water & sanitation • Food • Health • Maintenance **c)** Camp Withdrawal Method B. Water and Sanitation • Introduction to water and sanitation. • Global view of Water and Sanitation and WHO statistics. • How water is contaminated and identifying clean water • Household water treatment and safe storage • Understand Communicable Diseases and Prevention • Water born deceases and primary prevention measures • How to reduce Diarrhoea morbidity in emergencies • How germs spread: - Drinking safe water, boiling water before drinking - Prepare food hygienically and keep safe from flies. - Use safe toilet for defecation - Proper disposal of solid waste - Hand washing techniques and - When to wash hands with soap and water. • Roles and responsibilities of VDMCs focusing on water, sanitation and health in emergency situations/ disasters

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E. Supply of Tools, Equipment and Materials to VDMCs and Disaster Management Units at District Secretariats

After facilitating to setup VDMCs and providing the specialised training to its members, CARE decided to provide each VDMC with material assistance to the value of LKR 130,000/- (approximately) for carrying out their functions more effectively.

VDMCs were requested to list out the required materials, equipment and tools based on their need. Since VDMCs are expected to operate independently and have to be self-sufficient financially, they can hire some equipment in order to generate their own funds. VDMCs were considering this important fact when they were in the process of preparing their material lists. Within its budget allocations, CARE supplied tools, equipment and other materials to VDMCs as per their request.

In addition to the tools, equipment and materials provided to the VDMCs, CARE also provided a total of 80 life-jackets to Ampara, Batticaloa and Plonnaruwa District Secretariats based on the request made by the Disaster Management units attached to them.

F. Fundraising Activities for Disaster Management Committees

Training was provided for the VDMC members on tools for fund raising activities, to generate funds for emergency situations. This fund would be utilized by the villagers during an emergency situation until such time that the Government or any other responsive parties would reach them for aid. These fund raising mechanisms include a membership fee from the villagers, fundraising via organizing village fairs, selling fund raising (raffle) tickets, giving on hire the committee owned equipment for village level functions etc.

G. Carrying-out Disaster Mitigation Civil Work

Whilst developing the Disaster Management plan for the communities, it became evident that certain infrastructure needed to be developed to reduce future disasters. CARE requested the communities to prioritize their needs according to the impact. Such implemented programs are described in Table IV.

VI. Impact of the Disaster Risk Reduction Program

Initially the communities did not have any village level organisations to get help with regard to disaster risk or an emergency. It was only the *Grama Niladhari* (GN) who used to shoulder the burden alone. Thus, community members had a dependency mentality in receiving aid from government and other donors. They were in the habit of fighting amongst themselves and with the GN and other officials for the limited resources sent by the government. They also never involved or had any say in the aid distribution mechanisms.

However, as a result of CARE's DRR intervention, various community level structures and organisations have been set-up for the purpose of disaster risk reduction. For example, at every GN Division a VDMC has been formed and under their direction, different Community Disaster Response Teams (CDRT) had been set up.

The GN has to be the head of the VDMC (as per the act) and the others consist of community members and CBO leaders and other grassroots level government officers. Thus, the community had now been empowered to face future disasters more confidently, eliminating all previous anomalies and problems. Not only can they implement any programme to mitigate a future disaster, but also can get directly involved in the distribution of aid material, search and rescue operations as well as managing welfare camps in the event of a disaster.

TABLE IV
SELECTED DISASTER MITIGATION STRUCTURES AND FAMILIES BENEFITTED IN EACH DS DIVISION

District	GN Division	Disaster Mitigation Civil Work Implemented	No of Families Benefited
Polonnaruwa	Kurulubedda	Constructing a community well (23 feet diameter and 21 feet deep) for drinking water including pump-house and installing high capacity 3-phase electric water pump	190
	Phalayakkure	Construction of 03 segments of retention walls along field canal and rehabilitation of road	50
Ampara	18th Colony	De-silting and renovation of Ambalanoya water channel	375
	Akkaraipattu-6	Raising and constructing an internal concrete road	475
Batticaloa	Vellaveli	Constructing a retention wall on both sides of an internal road	120
	Ranamadu	Constructing a retention wall on both sides of an internal road	90
Total			1,300

Since, VDMCs had to be registered as self-governing organisations; they can generate their own funds. Therefore, the VDMCs are in a position to take independent decisions quickly in mitigating disasters or in coordinating emergency response related activities in an emergency situation.

VDMCs and CDRTs have been directly linked with various local government officials of the District Secretariat, DMC, Wildlife Department, Irrigation Department, the Mahaweli Authority, the Military, Medical Officer of Health (MOH) and Public Health Inspectors (PHI) of the Health Department. Thus, the villagers are now empowered to communicate directly with such officers for advice in mitigating disasters and/or are able to request for assistance in any emergency situation, cutting down unnecessary delays.

As a result of the close rapport established between the VDMC of Damana in the Ampara District and the Wildlife Department, the latter has agreed to construct an electric fence

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bordering the jungle to prevent the elephants from invading the village. The Wildlife Department has already included the cost in their next year (2013) budget for government approval for this purpose.

The VDMCs and the different CDRTs are linked with the DS and DMC with a two way communication structure called 'top to bottom and bottom to top'. This communication channel enables the DMC to inform any village of an impending disaster and in the same way the villagers can inform the DMC of any impending disaster originating from their villages.

In most of the training sessions conducted by CARE, the participation of women was significantly high from all communities. This programme had empowered more people in changing their attitudes, especially, women to be more self-reliant and utilise available resources in mitigating and managing disaster risk.

Numerous training sessions were conducted on first-aid, camp management and water and sanitation from the DRR perspective. However, as an additional benefit, this knowledge had enabled the community members, including men, women and children to follow good hygienic practices in their daily household work such as; hygienic cooking, keeping cooked food covered, collection and proper storage of drinking water, usage of safe toilets for defecation, proper hand washing with soap and water and eradicating mosquito breeding places. These have contributed greatly in enhancing their family health.

On the other hand, their knowledge on basic first-aid had enabled women; to prevent milk choking in infants, rescue a child/ adult who has accidently fallen into a household well, provide initial first-aid in the case of snake bites and animal attacks prior to dispatching victims to hospital etc. These had contributed in reducing the number of casualties from such unfortunate incidents.

Training given on water and soil conservation had enabled the farmers to understand the importance of soil and water as important resources and the need to conserve them for disaster mitigation, especially, during a drought or in flood control. They had also realised the importance of soil erosion to prevent silt deposit in irrigation canals that can contribute to future floods. Using this knowledge and adapting to soil and water conservation methods had enabled them to increase productivity in their cultivations, especially, with respect to paddy farming.

Training sessions that were conducted by CARE to increase the capacities of local government staff, attached to the District Secretariats, have enabled these officers to act more responsively to the needs of villagers and communities in disaster mitigation and emergency response.

Supplying of tools, equipment and material to the VDMCs had given them an opportunity to familiarize in usage and skills in handling such equipment. This had enabled them to use such equipment (life-jackets, generators, re-chargeable torches) with much ease during an emergency situation. On the other hand, CARE had donated 80 life-jackets to the disaster management units of the District Secretariats at their request. These can be dispatched very quickly for search and rescue operations in an emergency situation for saving lives.

Under disaster mitigation civil work, many interventions had been carried out benefitting 1,300 families. Two such interventions had the greatest impact. They are;

i. Construction of a large well of 23 feet diameter for drinking water supply purpose, with a pump-house and a high powered electric water pump installed in Kurulubedda in Polonnaruwa. This village comprising of about 500 families had an acute drinking water shortage. This intervention had solved their issues of drinking water needs, permanently even during long drought periods.
ii. Ambalanoya water channel in 18th Colony in Ampara had not been de-silted for the last 47 years and had periodically contributed to flood damage since 1984. Since the government did not have resources for de-silting operations, CARE facilitated the VDMCs to do it. As a result, during the recent heavy rains experienced in January 2013, no flood damage was reported from that area. Also, the paddy farmers had a bountiful harvest.

CONCLUSION

The village level disaster management committees and their sub-committees and functions have proven to be effective in managing disasters in this flood-prone region of Sri Lanka. They are capacitated well to carry-out necessary actions during a disaster situation, until such time that aid and government support can be reached. With the past history of tsunami, floods and other natural disasters Sri Lanka had to face, the VDMC system stands as a great approach to community level disaster risk management in the future. The process of the disaster risk reduction program, supports the establishment of these community based disaster risk management systems.

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The formation of waste collection fees within the advanced organised waste collection scheme

Jana Põldnurk

***Abstract*—** The current paper introduces the equations for the formation of the municipal waste collection fees within the advanced organised waste collection scheme (OWCS). According to the national Waste Act, the local authorities in Estonia must organise municipal waste collection, and treatment on their territory holding a public procurement to select the waste collection service provider. The municipality must define the principles of pricing the waste collection service in the local waste regulation. This enables the municipality to take more control over the formation of the waste collection service prices, and makes the waste collection fees more transparent, however most of the Estonian municipalities have not occupied this administrative tool. The main problems regarding the municipal waste collection fees in Estonia stand in opacity, inequity, and confusion, which is the result of weak evaluation criteria of the waste collection public procurements. Another prevailing issue in the Estonian local authorities is the deficiency of financies for the administration of the public waste management. Within the advanced OWCS some of the waste management costs can be transfered from the budget of the local authority, and integrated to the waste collection fee, thus fairly implementing the polluter pays principle, and relieving the deficiency of finacies for the public waste management.

***Keywords*—**administrative efficiency, municipal waste management, polluter pays principle, public procurement.

I. Introduction

As defined in the national Waste Act, the organised waste collection (OWC) is collection, and transportation of the municipal waste from the predetermined waste collection district to the predetermined waste treatment facility by a waste company selected by the local authority. The local authority holds a concession of services procurement to select the waste collection service provider, and determins the waste treatment facility. As the result of the public procurement, a waste collection service provider enter into contractual relationship with the local authority up to five years. All households are required to join the waste collection system. The size of the waste collection district should assure the fill up of a waste truck in one collection route but may comprise generally no more than 30,000 inhabitants. The OWCS involves the mixed municipal waste, and the source sorted waste. The local authority must define the principles of pricing the waste collection service in the local waste regulation [1].

The advanced OWCS allows municipality(ies) or a non-profit organisation authorised by the municipality(ies) to take over the customer database so that all the waste holders become clients of the waste management centre (WMC), which would then be the only client of the waste collection company, and fully responsible for the waste collection service as an administrative body. In the advanced OWCS the municipality holds separate public procurements for waste collection, and waste treatment services. The municipality bills the waste holders, and pays for the waste collection service to the waste collection company, and for the waste treatment service to the waste treatment company, thus acting as the customer service, and accounting center. The redirection cash flow from "waste holder → waste company" to "waste holder → WMC → waste collection company, and waste treatment company" enables to integrate some waste management costs (e.g. waste holders register, domestic hazardous waste collection, advising, and awareness raising activities) into waste collection fee as the administrative costs, which disencumbers the the municipality's budget from those expences. The two main differences of the advanced OWCS compared to the regular OWCS are the redirection of the cash flow, and separation of the waste collection, and waste treatment services [2].

The principles of waste collection service pricing set in the local waste regulation, and tenders evaluation model of the waste collection service concession procurement are the key factors which create the base for the fair, and transparent formation of the waste collection fees. Another key factor is the qualification criteria which limit the circle of tenderers, and in association with the other requirements and conditions of the concession contract assure the quality of the waste collection service. Beside the mixed municipal waste, source sorted paper waste, and bio-waste can be involved to, and centrally collected within the OWCS. Thus, the OWCS, especially the advanced format of it, has given a set of administrative tools to a local authority to organise the environmentally sound, and economically fair municipal waste management on its territory.

A new model for a fair, and transparent formation of the municipal waste collection fees, including the tender evaluation model of the OWC procurement is introduced in the current paper. Also the main tender specifications, and qualification criteria of the OWC procurements which would

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improve the quality of the OWC service are briefly overviewed, and reasoned. Since the OWC is a public communal service, the main principles of the public procurement including fair competition, contribution to the environmental sustainability, transparency of the evaluation criteria etc., must be applied to the OWC public procurements.

II. The practice of the OWC procurements in Estonia

Since 2004 when the local authorities in Estonia started to change over from the free market model to the OWCS, the waste collection service public procurements have been continuously accompanied by trials, contentions, and complaints. It has been a common practice that as soon as a public procurement in any local authority has been announced, one or another waste company, a potential tenderer sues the municipality. Over 150 adjudications regarding the OWCS can be found in the Database of the Court Decisions, most of them solving cases the waste company versus municipality [3]. The concealed reason for this kind of counteract is to maintain the market share, and delay the implementation of the OWCS.

It is obvious that the waste collection public procurements result in the tight pricing competition between the tenderers, and the municipality's control over the waste collection fees. In many cases the subject of the claim are tender specifications which are referred as stipulations limiting the circle of the tenderers, and the evaluation model which make the result of procurements. The most common evalutation criteria in the OWC procurements is 100% price criterion, meaning the lowest price offer wins the procurement. Since the waste collection service involves a set of fees for different types of containers with different numbers of emptying, all the evaluation models which do not consider the whole cost of the waste collection service, in other words the sum of money collected from the waste holders, can be qualified as inadequate type of tender evaluation model for this kind of service because they only reflect the pricelist of the different parts of the service not the whole cost.

The most common evaluation model practiced in the OWC procurements is the merit-point system (MPS), in which different weighs of value are given to different types of containers, thus affecting the tenderers' pricing stategy. For example, if more merit points are attached to the smaller containers (e.g. 80 to 240 litres) compared to the bigger containers (e.g. 600 to 800 litres) then naturally the pressure is on the collection fees of the smaller containers. This may result in the situation where the collection fees of those containers are lower than their net value, and the collection fees of bigger containers which earned less merit points are remarkably higher than they would be in the free market. Then the whole pricing policy bases on the cross-subsiding between small, and big containers, meaning the users of the big containers will pay for the waste collection of users of the small containers. In a settlement of high population density the whole scheme works in opposite way: higher merit points are attributed to the bigger containers, and lower weighs to smaller containers. The most drastic examples of the MPS practice are cases where the collection fee of a smaller container is higher than that of a bigger container (e.g. 2,70 € for a 240 litres container versus 1,94 € for a 600 litres container) [4]. The whole scheme is at variance with the polluter pays principle, and gives enough ground for sueing the procurements. Therefore a strong need for an adequate evaluation model which enables a fair, and transparent pricing policy has been present already for few years.

Another issue regarding the OWCS in Estonia is the size of the waste collection districts. The restriction arising from the Waste Act on the number of inhabitants a waste collection district may involve is 30,000. There are only 5 cities out of total 215 local authorities which number of inhabitants exceeds 30,000 (Tallinn, Tartu, Narva, Pärnu, Kohtla-Järve) [5]. Most of the waste collection districts in Estonia are formed on the basis of the administrative territory, and 70% of municipalities have less than 4,000 inhabitants. Only in few regions the municipalities have cooperated to form conjoined waste collection districts which then comprise a reasonable number of inhabitants. There are 6 regional cooperation organisations (Central Estonian WMC, Eastern Estonian WMC, Rapla County WMC, Valga County Environmental Services Centre, Hiiumaa County Council, Communal Services Center of Harju County), which have successfully formed conjoined waste collection districts, and few other cooperation attempts between some municipalities to form overboundary waste collection districts, comprising altogether approximately 300,000 inhabitants in about 30 districts from about 100 municipalities [4]. Thus, the average size of a conjoined waste collection district is 10,000 inhabitants, which is still far smaller than eligible. The bigger waste collection districts are obviously more attractive to the tenderers, and motivate to offer lower waste collection fees at the public procurements.

III. Tender specifications, and the OWC contract conditions

The common practice in Estonia is that the conditions and requirements of the OWC contract to be signed between the municipality (or the authorised non-profit organisation), and the public procurement winner waste collection company are mostly described as the tender specifications. The usual qualification criteria involve fullfilling the tax duties, and abcence of criminal or professional records. Commonly the possession of the waste collection/treatment licence, experience at the waste collection market (usually at least equal to the service volume of the waste collection district), and sometimes the sertificate of the environmental quality management (ISO, EMAS or equal) is required.

The conditions of the OWC contracts may vary at a large scale from municipality to municipality from detailed description of the waste collection service, and strict technical requirements to a very general conditions that the municipal waste must be collected from households and treated

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somewhere [4]. The conditions introduced, and reasoned below are suggested by WasteBrokers LLC. Those conditions may rise the waste collection fees but are necessary for the municipality in order to gain better control over the waste collection service. The following list of the conditions is not final, only the major conditions are disserted. Most of the requirements have arisen from the practical experience of the OWCS, step by step evolved from execution of one or another OWC contract.

A. Technical specifications

1) waste trucks must be passed through the technical inspections, and be technically in order;
2) waste trucks may not be older than e.g. 10 years, or must meet the the EURO IV requirements;
3) waste trucks must be provided with the utilities/repellents to clean up any waste spilled during emptying containers or driving, also the absorbent to clean up any liquid waste;
4) waste trucks must be provided with the GPS-device, mobile phone, and camera;
5) waste trucks must wear the label of the company, and the drivers must wear the uniform;
6) waste containers hired out must meet the standards, be labeled, and in fine condition.

It is natural that only trucks which are legally, and technically in accord may participate the competition. In order to contribute to the sustainable development, and reduce the environmental impact of the waste transportation, the requirements ot the exhaust gases are imposed. The equipment for spillage clean up mitigates the pollution risk. The GPS-device, mobile phone, and camera are necessary in case of conflicts between the waste holder and waste contractor, e.g. if the container contains improper waste, and is left unemptied, the contractor can immediately contact the client, and inform about the situation, and also record the situation with the camera. GPS-device enables to track the itinerary of the waste truck. The containers hired out by the contactor must meet the requirements of the local waste regulation, and be labeled with the requisites of the contractor.

Most of those criteria rise the quality standard of the waste collection service, which may result also in higer waste collection fees. For example, a GPS-device, phone, and camera are not essential for the waste collection service, but facilitate solving any communication problems increasing the satisfaction of the clients. The environmental requirements which are stricter than set in national or EU legislation serve mostly the objectives of sustainable development.

B. Service quality

1) customer service must be available by phone, e-mail or counter service;
2) reaction to the complaints, orders or subscriptions may not take longer than e.g. 3 working days;
3) contractor must inform the client about any circumstances which make the waste collection impossible, such as absence of access to the waste container (the container or gate is locked, the gatewasy is impassable), improper waste in the container like bio-waste in the paper container, broken container etc.;
4) contractor must provide the waste holder with the necessecary number, and types of waste contaienrs for each waste classes, and adjust the container emptying frequency according to the waste generation of the paricular waste holder;
5) contractor must clean up any spillage caused during emptying the waste container or waste transportation.

The service quality stands mostly on the conditions set on the OWC contract. Since the waste company gains the monopoly for the period of the OWC contract, there is no pressure of competition like it was at the free market conditions, and the exclusive position may result in a loose quality of the service. In the very first OWC contracts, merely any requirements were set on the customer service, and communication. For example the implementation of the OWCS in Tallinn pilot districts was accompanied by extensive displeasure of the waste holders caused by the miscommunication, and poor quality of the customer service. Although the containers are not involved to the OWCS, in the case of need the contractor must be capable of providing the waste holders with the containers. It is also natural, that after waste collection the area is still clean and free of any spillage caused by the emptying waste containers or transportation of the waste.

C. Reporting

1) contractor must keep minimum for three months all the recordings, files, e-mails, and photos regarding the communication with the clients;
2) contractor must periodically (monthly/quarterly/annually) fill a detailed report about the waste collection service performance which presents the volume and weigh of the waste collected and treated, milage of the waste trucks, number of emptyings per each type of containers, overview of the complaints from the waste holders etc.;
3) contractor must keep the waste holders register, and periodically update the database. The register comprises the following data: addresses, and names of the waste holders; status of the waste holders (incorporated to the OWCS, exempted from the OWCS); number, and types of the containers for each waste classes; emptying frequency of the containers; overdues, and indebtnesses; other records;
4) contractor must inform the municipality about any violation of the local waste regulation requirements which the contractor finds out.

The demand for maintaining the records for a certain period helps to solve any conflicts or misunderstandings between the contractor and municipality or waste holder. The detailed reporting about the waste collection service in particular waste collection district give the municipality not only overview about the waste collection service but also a good input data for the next public procurement. The more precise input data

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about the service is given in the tender specification, the more fair is the competition, and the more judicious tenders will be made. The waste holders register is a good virtual tool for supervisory and statistics if the data is periodically updated.

D. Additional conditions

The prices of those services which are not involved to the OWCS but are inseparable for the regular waste collection such as the rental of the waste containers, unlocking the containers or gates with the waste holder's key, manual transportation of the containers from a certain distance (10 or more metres) to the closest possible stop of a waste truck, washing the containers etc., are fixed.

Many local authorities have demanded the bank deposit or accredidation letter from a bank to warranty the accomplishment of the contract conditions. However none of the municipalities have ever tried to put this type of warranty into practice. Thus it may be a pretty much useless condition which only rises the price offer because it is costy to the tenderer.

The contractor may not rise the waste collection fees without the permission of the municipality. The waste collection fees will be risen only if the direct expences (such as the price of fuel, gate fee of the waste treatement facility) of the waste collection service have increased. This condition can be implemented olnly if the compnents of the waste collection fee are clearly defined or separable. Otherwise the condition is not objective. Another option practiced widely is the fixed pricing for the whole contract period without any possibility to rise the collection fees.

The collected waste must be delivered to the waste treatment facility determined by the municipality. This condition is taken from the Waste Act literally, but interpreted arbitrarily by both the municipalities, and waste companies, and has been one of the reasons for prosecutions. As the waste companies have declared, this condition is limiting the freedom of enterpreneurship. The municipalities who have not appointed a particular waste treatmet facility but outlined the condition generally cannot gain any control about the recycling or recovery of the municipal waste later during the concession period neither.

By the end of the contract the contractor must give over the upgraded database of the waste holders register, and not counteract to the next contractor overtake the waste collection district. The contractor has to update the data of the waste holders register, and give it over to the municipality.

IV. The Equations for Waste Collection, and Treatment Fees

The equation for OWC service fee, including formulas of waste collection fee, and waste treatment gate fee introduced below is worked out by WasteBrokers LLC basing on different common tenders evaluation models. The formulas are used for evaluation of the tenders at the OWC service public procurement. All the components of the waste collection, and treatment service (collection, and administration, transportation, and treatment) are taken into account separately which enables to change/recalculate them independently during the period of contract. The evaluation model for waste collection service has been practiced in some of Estonian municipalities, and has given clearly positive results in terms on transparency of the price formation, and comparison of the tenders. The whole set of eqution (collection, and treatment service separately) has not been practiced yet, but the legislative prerequisites are created in the local waste regulations of few municipalities [6,7,8], and the evaluation model will be implemented in the next round of the public procurements which will be held before the current waste collection contracts end, perspectively within next few years.

Only the equations for mixed municipal waste fee is introduced below because the paper waste is usually collected free of charge if the waste collection company retains the possession of the paper waste, and the equations for the source sorted bio-waste are identical, ant the amounts of this waste are marginal.

A. The collection fees

The tender evaluation criteria at the public procurement of the OWC service concession is 100% price criteria. The tenderers offer the collection fees (€) for the different size groups, and types of waste containers indicating separately the calculated percentage of transportation costs within the collection district, and transportation from the collection district to the determined waste treatment facility. Then the annual waste collection fee is calculated for each group of containes multiplying the collection fee by the number of emptyings per year, and the annual cost of the collection service is calculated as follows:

$$K_A = (K_{M1} \cdot E_{M1}) + (K_{M2} \cdot E_{M2}) + (K_{M3} \cdot E_{M3}) + (K_{M4} \cdot E_{M4}),$$

where

K_A – total annual collection fee;
K – collection fee for particular type of container;
E – number of emptyings of particular type of container a year;
M1 – type of container, e.g waste bag with volume of 50...100 litres;
M2 – type of container, e.g small two wheels container with volume of 80...400 litres;
M3 – type of container, e.g four wheels container with volume of 600...1,100 litres;
M4 – type of container, e.g container without wheels, deepload containers etc. which need special mechanism for their emptying.

The best tender is the one which sum of the annual collection fee (KA) is the smallest. The grouping of containers may differ in municipalities depending on what kind of containers are more or less used. The technical parametres such as age of the truck, service quality, reporting, customer service or other determined as the tender specifications, and qualification criteria are not subject of evaluation.

B. The treatment service fee

The evaluation criterion at the public procurement of the

municipal waste treatment service is 100% price criterion. The tenderers offer the gate fees (€/t) for treatment (recycling, and recovery operations) of the mixed municipal waste, and indicate the location, and distance of the treatment facility from the collection district. Then the combined gate fee is calculated as follows:

$$CF = L + S \cdot T / w, \text{ where}$$

CF – combined gate fee (€/t);
L – gate fee at the treatment facility (€/t);
S – the shortest distance for fully loaded waste trucks between the treatment facility, and collection district (kilometres);
T – transportation cost, constant 1 €/km;
w – weight of the load, constant 8 tons.

The best tender is the one which combined gate fee (CF) is the smallest. The technical parametres such as the rate of recycling or recovery, annual capacity, and other environmental requirements determined as the qualification criteria are not subject of evaluation. The combined gate fee enables to consider the transportation costs in the collection fee, and are used only for evaluation model. The contractor will receive only the offered gate fee for his service.

C. The OWC service fee

The final OWC service fee of a mixed municipal waste container is calculated as follows:

$$T_m = K_m + k \cdot m \cdot L \, (\cdot J_m), \text{ where}$$

T_m – the fee (€) for collection, and treatment for waste contained in particular container (€);
K_m – the collection fee (€) for the waste contained in particular container which includes the costs of waste transportation from waste generation site to the waste treatment facility, costs of fuel, logistics, preparation of the waste collection, and other costs of waste collection company directly linked to the OWC service, except the costs of other additional services not involved to the OWCS such as rental of the container, unlocking the container or gate, transportation of the container from further than 10 metres, container wash etc;
k – the coefficent of the volume weight of the mixed municipal waste (t/m^3) which is determined separately for each municipality, and procurement (usually in range of 0.13-0.17), and which the municipality has right to change if during the concession contract occurs that the real volume weight differs from the agreed one;
m – the volume of the container (m^3);
L – the gate fee for the mixed municipal waste (€/t) at the determined waste treatment facility;
J_m – adminstration fee coefficent which the WMC/municipality has right to apply in case of implementation of the advanced OWCS; it is a cost-based coefficent, which includes the municipality's/WMC/s expenses directly linked to the administration, and organisation of the OWC, such as salaries of the officers, keeping, and development of waste holders register, accountancy, and bookkeeping of the OWC, including rescontra, and incasso, logistics, customer service, and call centre (either within WMC or procured).

V. Conclusion

The formation of the waste collection fees within the OWCS, especially within the advanced OWCS have to be transparent, and fair. A set of equations for the waste colletion fees worked out by the WasteBrokers LLC enable municipalities to implement the comprehensive tender evalutation model at the OWC public procurements, which creates the equal opportunities to the tenderes, and facilitiates the tenders evaluation process. The implementation of the formulas result in transparent waste collection fees, which each component is clearly distinguishable, and economically justified. Strict requirements of the OWC contract assure the quality of the waste collection service, and municipality's control over the waste collection fees. The advanced OWCS enables to integrate some of the administrative costs of the public waste management into waste collection fee thus freeing the municipalities budget from those costs.

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Jana Põldnurk, née Kivimägi, planned, and developed the organised waste collection scheme in Tallinn City Government while working at Tallinn Environmental Department Waste Management Division as a chief specialist in 2003-2006, and as the head of the division in 2007-2010. She worked out the conditions, and requirements of the OWCS public procurements including the tender specifications, qualification criteria, and tenders evaluation model. As the head of the division, the waste management planning, development,

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Selected Indicators of Ethics Perception in the Czech Republic Business

Petra Horváthová, Martin Černek, and Kateřina Kashi

***Abstract*—**Ethics and related morale is continuously the subject of frequent discussions of philosophers, economists, managers, entrepreneurs and politicians. Czech society (but not only this one) and with it connected business sector has undergone significant changes in the last twenty years. Therefore, the research problem in this paper presents current situation and the position of ethics in business and managerial work. It is dealing with unsystematic and inconsistent approach, and a view of what ethics in business and social practice actually is. The paper also deals with the level of ethical climate as a global problem in Czech society, which permeates through all social structures. Therefore, main objective of this paper is to contribute to the knowledge, understanding, current status, level of perception's awareness of ethics and morality in business and social spheres based on both theoretical analysis and resource bases, and own empirical research.

***Keywords*—**Business ethics, Czech society, pilot survey, qualitative analysis.

I. Introduction

IF the main aim of entrepreneurship is to maximize profits then it is impossible not to encounter in practice the irresponsibility, performance orientation and motivation, increase need of money and consumption etc. We meet with ethics resp. with its disobeying practically every day. Large-scale media and mass media are informing us daily about law violations, but also about the facts and situations which are not clearly stated in law but they are generally known and violating these rules/laws is considered unethical and immoral.

Many managers and business owners are asking themselves whether there is any sense in dealing with ethical and moral aspects of business. It is generally said that you either behave consistently ethically and morally, but in this case you do not have much chance of success at the market, or you are successful, efficient, and competitive, simply you are earning money, but ethics is a luxury for you, it is a luxury good. Ethics, morality and success in business do not mix. This is then related to overall increase in corruption, economic crime and other social and socio-pathological phenomena. However, now in a time of falling economic results of enterprises and overall companies' deterioration, enterprises and companies are more interested in ethical aspects, tracking the causes and consequences of its absence not only in interpersonal relationships, but especially in the business and commercial sphere. The importance of applying ethics in business and management is discussed very often, different views are presented as to why and how much is ethics in business important, why ethics is a necessary prerequisite for the future development in all areas of social existence. The importance of business and management ethics is becoming more urgent and necessary as the globalization's process is coming to its peak. Here, we are dealing with overcoming up to now respected opinions and searching for ways to form new interpersonal relationships and creating more dignified business environment. Tendencies, trends and topicality of this problematic are suggested by the fact that many various ethical conferences, seminars, trainings, symposia etc. are being organized. At the same time they discover and promote approaches which state that especially linking business ethics and enterprises' social responsibility belongs among one of the competitive advantages on the market and represents the image of corporate culture [1].

This pilot survey follows and in fact complements current, already executed investigations in the field of business ethics and social practice. We work on the assumption that it is not possible to comprehensively and methodologically cover the problem only based on a single study or partial empirical research. Therefore, it is necessary to perceive the results (findings) as complementary. The structure and content of the research is based on the work of [2], [3], [4], [5], [6], [7], etc.

II. Material and Methods

Executed research, data processing and overall interpretation represent a qualitative approach. Due to the content type, objectives and overall purpose of the empirical investigation the following technique was selected – questions about attitudes (questionnaire). As it was already mentioned, the questions that could not have been evaluated quantitatively are interpreted verbally. During the evaluation logical methods of scientific work were used, including exploration method based on semantic operationalization (abstraction,

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specification, generalization, analysis, synthesis, induction and deduction).

307 respondents participated in the empirical pilot research (survey). Basic condition for participation in the survey was permanent employment of the respondent (economically active). Because of the researches' problem objective the respondents' experience with ethical aspects in working environment is fundamental. Individual questionnaires were delivered personally through instructed assistants. This research sample surveyed *129 men* (42%) and *178 women* (58%).

The educational structure of respondents: in standardized empirical research the educational structure of researched sample belongs among fundamental history data. Thus inductively is drawn the a priori relationship between the respondent's education and inherent values by the credibility of data provided. This structure shows that only 3.6% of respondents have primary education, 30.3% secondary education and more than 66% of respondents have a university education, which should be perceived as positive.

The distribution of respondents by region: It is more than understandable, given the place of the personal distribution of questionnaires, that half of the respondents are from the Moravian-Silesian Region. However, the percentage of respondents from other regions is by no means insignificant. For methodologically ideal case (statistically representative sample) it would be necessary to ensure sufficient number of respondents in all regions, so that it would be possible to create an overall picture of the study population. It would also be interesting to see the relationship between individual representation in the regions and their testimonies. However, in this study this was not the aim.

III. Results

Based on the empirical survey (questionnaire survey) respondents were asked a total of 25 research questions that tried as much as possible to explore given issue. Research questions were divided into two thematic areas. *First set of questions* identify common ethical aspects associated with business operations. *Second set of questions* already survey the ethical aspects of business in the respondents' own department.

A. Ethical Aspects of Business in General

Question No. 1. Do you think it is important to consider ethics in business?

The vast majority of respondents *95%* agree that it is important to consider ethics in business. Other research also confirms that the interest (especially from stakeholders) to ensure that the businesses behave and act ethically is eminent. Likewise it can be assumed that vast majority of the population would claim that it is important to deal with ethical aspects of business, nevertheless the overall level (practice) shows completely different facts.

Question No. 2. Do you think that businesses in the Czech Republic behave ethically?

The results show that more than *60%* of respondents believe that businesses in the Czech Republic behave rather unethically. Only *18%* of respondents claim that firms behave rather ethically. *14%* unequivocally say that businesses in the Czech Republic do not behave ethically. *5%* of respondents are not able to assess the situation. Only two percent say that business conduct is ethical.

Question No. 3. What do you think about the situation of ethics in business in the Czech Republic?

The question was formulated in terms whether the situation of ethical climate in business in Czech Republic is improving or worsening or remaining the same. *18%* say that the situation is still the same, it does not develop. It is also interesting that *14%* of respondents feel that the situation of ethics in business is getting better. *10%* of respondents cannot evaluate this situation and only two percent of respondents do not care, they are not interested at all in the issues of business ethics.

Question No. 4. According to your opinion what is the situation in the Czech Republic in terms of compliance with business ethics in comparison with other countries (European Union)?

Here, of course, it can be assumed that respondents can credibly and adequately assess the situation of business ethics in comparison with other countries. Nevertheless, even this information provides some relevant facts. More than half of the respondents perceived the situation in comparison with foreign countries as rather worse. *15%* of respondents believe that this situation is certainly worse. *13%* consider this level as comparable and the same number of respondents could not adequately assess this problem. Further, none of the respondents chose (on the scale) the possibility that the ethics situation in comparison with foreign countries is definitely better. However, *4%* of respondents reported that the ethics situation in the Czech Republic seems to them rather better than abroad. Of course, this fact would have to be more developed and it would be necessary to find out why the respondents have this opinion, more precisely based on what.

Question No. 5. Which companies in your opinion often behave ethically?

57% of respondents think that the level of ethical climate is better in multinational companies and organizations, which basically corresponds directly with the results of Question 4. *21%* of respondents are not able to assess the situation. *13%* think that state enterprises with public participation are more likely to behave ethically. *9%* say that ethical behavior is more common in private companies and enterprises.

Question No. 6. Do you think that ethical behavior in business has some importance (benefits)?

65% of respondents say unequivocally that ethics in business activities is important. More than a quarter of the people surveyed have some doubts about the importance of ethics in business, but they still think it is needed. Five percent of respondents are not able to assess the importance and the value of ethics in business. *3%* percent of the people surveyed have a doubt about the importance and benefit of ethics in

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business. Only one percent stated that ethics in business has no meaning or benefit. However, even this one percent is significant due to the examined problematic and thematic interest.

Question No. 7. What do you think derives from ethical business? (max. 5 options)

Here, the respondents reported specific benefits associated with ethics in business. For better clarity and focus it was possible to only state maximum five reasons. Among the major reasons belong: *company reputation, strengthening corporate culture, keeping skilled employees, competitiveness.* Other less significant reasons are**:** *increasing product quality, sales growth and profit growth.* Interestingly, the respondents did not mention as the main reasons for ethical business: reducing risks in the company, reduce costs, increase employees' work efficiency, etc. The results correspond with the results of previous surveys and other research.

Question No. 8. Do you agree with the opinion that ethical behavior is beneficial for company in a long term?

More than half of respondents *54%* state, that ethical behavior is definitely beneficial for company in a long term. *35%* of respondents are not directly convinced about this fact. *6%* of respondents state that even in the long term perspective the ethical behavior is not beneficial for company. Two percent of respondents are not able to assess this situation. In case of low percentage representation of negatively perceived opinions these responses are significant. It cannot be proven how the answers would look like if the question was given for a short time horizon.

Question No. 9. What are the biggest ethical problems in the Czech Republic? (max. 5 options)

Here again, respondents had the opportunity to present up to five most serious ethical problems in business today. It was more than likely that respondents would indicate currently the most acute ethical issues. Here, clearly and understandably "reigns" the problem of *corruption* and *bribery (86%).* Then follows: *unfair treatment of employees, unfair sales and marketing practices, financial fraud, non-commercial conditions or poor quality products and services.*

Question No. 10. What do you consider as the main factors of successful business in the Czech Republic? (max. 5 options)

The respondents consider as the greatest factor (condition) of successful business in the Czech the quality of the product. However, it is interesting that in the previous question 9 poor quality products and services represent only *21%*. Furthermore, it is about prestige and reputation of the company, innovation, clear corporate strategy, network of contacts and friends or corporate culture. Ethics in business as a factor of increasing success in business is seen only by *18%* respondents. The possibility to write their own factors for success in business was utilized by only two respondents, their answers were: production flexibility and quality marketing strategy. Although the percentage is not very significant, it provides very interesting and practical opinions and suggestions.

Question No. 11. Based on your opinion in what area (sector) is unethical behavior taking place most often?

Based on respondents it is clear, and it is quite understandable and logical that the unethical behavior is taking place in *profitable* sector. Nonprofit sector is based on respondents participating in unethical company's behavior by more than *17%*. Eight percent of respondents do not know or they are not able to assess this situation. The results are more than comprehensible because the environment where all of the company's activities are aimed at profit's creation and achieving expected "bottom line" the unethical behavior will be taking place more often. Everywhere where *"you dealing with money"* the people have a tendency to behave differently than in situations in which the people have a free choice of decision and where you cannot lose anything.

Question No. 12. Based on your opinion in what area (sector) is the unethical behavior taking place most often?

It is the same question as the previous one, however in this case it is asking for the ratio of unethical behavior or companies, organizations or institutions from the point of view of its ratio on its management. More than half of respondents state that unethical behavior is taking place more often in organizations with *state* participation *57%*. On the contrary, *24%* of respondents are convinced that especially *private* sector is the place with the biggest ethical problems. *11%* states that the highest level of unethical behavior is in the public sphere. The rest of the respondents *8%* cannot evaluate this situation.

Question No. 13. In what industry (sector) do you think is the highest level of corruption? (max. 5 options).

The highest level of corruption is obviously seen in the *political sphere 78%* since it is a sphere which represents the largest share of all decision-making and management processes within the state apparatus. Politics and its representatives have a major impact on the fundamental level of morality in society. Another problem sectors are: construction *65%*, health services *50%*, transportation *43%* and industry *42%*, etc. Due to our problematic it cannot be overlooked that *12%* of the respondents see corruption also in professional sport. Given the characteristics, importance, factors and the role of professional sport in society, which we discussed in detail in the theoretical part, these results are quite understandable.

*Question No. 14***.** Which feasible change would improve the ethics of the business in the Czech Republic?

More than half of the respondents claim that a fundamental change to increase the overall ethical and moral climate in the Czech Republic must be made in a people's way of thinking. Further, a lower percentage changes seen are: consistent law enforcement *(14%)*, compliance with existing standards and regulations *(12%)* and consistent control *(9%).* Other less significant changes seen are: amending, supplementing existing laws or changing people. Even the results of this survey somewhat correspond to the results of other studies.

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B. Ethical Aspects of Business Activity at Your Workplace

Question No. 15. How many employees does the company where you work have?

By asking this anamnestic question we are examining and in fact confirming the relation between the number of employees and the rate of ethics in an organization. Generally it is stated that the more employees organization have the more unethical practices are taking place. It is given especially by organizational structure, certain level of personnel complexity and anonymity, several levels of delegating authority, fulfilling working and functional roles etc. The highest number of employees *(30%)*, work in an organization, which has up to 10 employees. *22%* of respondents work in an organization with 11 to 50 employees. Because of place of questionnaire's distribution (Moravian-Silesian region) it is understandable that more than *16%* of respondents work in an organization that has more than 500 employees; they are most probably industrial companies. Further, *13%* respondents work in an organization with 51 to 200 employees and *12%* work in organization with 201 to 500 employees. Only *7%* of employees work (do business) individually.

Question No. 16. How can you describe your company?

This question is finding out the origin of organization's ownership. Main aim of this question was to find the connection between ethics level in organization and its origin. In the context of question 4 we can assume that with growing level of foreign capital the ethics level is higher. However, this cannot be proven without further analysis. In our case *61%* of respondents work in an organization with purely Czech capital. *30%* work in an organization which is a part of a multinational corporation and *9%* in a company with foreign investor.

Question Nr 17. Do you consider the behavior of your business to be ethical?

It is interesting that more than half of the respondents *51%* considered the behavior of firms, organizations in which they work rather ethical. *30%* of respondents believe that they are working in a company that is clearly behaving ethically. *12%* of respondents admitted that the company in which they work, behaves rather unethically. *6%* percent is convinced that their company certainly does not behave ethically. One percent of respondents are unable to assess the situation, they do not know.

Question No. 18. Are values and rules of conduct clearly defined in your company?

45% of respondents say that their company has clearly and transparently determined values, rules of conduct and behavior. *28%* of respondents state that the organization has probably these values and rules stated somewhere. Similarly, *17%* of respondents say that the organization for which they work does not have clearly defined values and rules of behavior. *8%* is sure that their organization does not have these rules.

Question No. 19. Do any internal ethical regulations exist in your company?

This question confirms predetermined hypothetical assumption that respondents perceive the presence of written and clearly defined rules of conduct and unwritten, informally abided forms of behavior and communication as contradictory. Although in a previous question almost half of respondents stated that organization in which they work have clearly determined values and rules of conduct; one quarter thinks that that they probably have these rules but almost *60%* report that their organizations have only unwritten code of ethics and one fourth of respondents is not sure. *15%* of respondents are aware of the fact that they do not have any formal ethical rules or standards. Aforementioned Code of Ethics is registered by only less than two percent of respondents.

Question No. 20. Do penalties/punishments for violating ethical rules exist in your company?

The logic is that if an organization does not have any formal ethical rules or clearly stated values of behavior, it cannot require obedience of these rules nor it can punish possible violation of these rules. Less than *40%* of respondents stated that their organization has an existing punishment for violating ethical rules. *33%* are not sure and *28%* say that they do not execute such penalties/punishments. It can be assumed that if the employees do not have any official rules, standards or set values of ethical conduct, they will rather comply with general, internal, informal ways of communication and habits.

Question No. 21. Has your company ever dealt with violation of the Code (rules) by penalties or punishments?

Here you can get a number of possible interpretations. *43%* of respondents stated that they were not aware about any penalties or punishments given by the organization to the violators of the Code. *32%* respondents state that their company has never handled such a violation. Only *18%* of respondents stated that their company has dealt with the violations of Code by some penalties or punishments. The respondents had the opportunity to mention specific measure(s) which were used in their company. Proposed solutions for violating the Code, the respondents reported only two options: dismissal *4%* and fine *3%*.

Question No. 22. Have you ever been a direct witness to situation in which your colleague behaved unethically?

We admit that this question might be perceived by respondents as very sensitive. However, we noticed that *38%* of the respondents witnessed unethical behavior of their colleagues. Almost *60%* of respondents did not encounter such problem. Due to the presented theoretical relationship and background it cannot be overlooked that *3%* of respondents do not know what it means to act unethically. This fact confirms so far presented opinions that citizens really do not know what exactly ethical and unethical behavior is.

Question No. 23. If you were a witness to this or you would find out about this, what would you do?

This question directly responds to the positive answer of the respondents for question 23. Almost *70%* of respondents say that if they witnessed or found out about colleague's unethical behavior they would have pointed it out to him/her. Only *10%* of respondents would notify their supervisor. *21%* of

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respondents would not bother with this issue at all. The question is what behavior and based on what would be more appropriate; how to react, how to respond, what behavior is expected by the colleagues and what by supervisors, and most importantly what does the person expect from himself/herself.

Question No. 24. In your opinion, how should be potential unethical behavior of employee handled?

Here, respondents could choose from a variety of possible solutions for unethical behavior in the organization. Interviewees answered very cunningly in most cases, *almost 64%* said that the solution of impropriety should be chosen according to the nature and gravity of the offense. You cannot punish various unethical behaviors by one universal way. Less than *13%* of respondents would solve unethical conduct of an employee by talking to them about it. Only *8%* of respondents would solve this issue by financial penalties. However, practice shows that especially financial penalty is the strongest stimulus in behavior change, especially in Czech national environment.

Question No. 25. Have you ever come across the CSR concept (Corporate social responsibility of companies)?

This last question was supposed to find out general knowledge about realized corporate social responsibility concept of companies and organizations; this concept is a specific practical application of ethics in entrepreneurial and managerial activities. Although CSR concept is not any novelty even in Czech environment, more than half of respondents *56%* do not know what CSR concept means. On the contrary *34%* state that they know what it is and only *10%* of respondents state that it is a part of strategic approach of their organization.

IV. Findings and Recommendations for Practice

Based on the results of own research and according to previously realized and in content similar research it can be stated that from various reasons we are still encountering large level of unpreparedness of company's and organization's management for certain innovation in ethic environment. Based on long-term observation of own practice, personal contacts and contacts with other academics it can be stated that main reasons for lack of interest in ethics in business from the management point of view are:

Insufficient, general knowledge about content, meaning, sense and place of ethics in economics, business and managerial work. This fact was also confirmed not only by this empirical study but also by other research studies.

Company's management is afraid of implementing ethics into company's culture. They cannot imagine what is connected with implementing ethics into business (advantages, benefits but also costs and expenditures). They are resisting uncertain, not examined forms of innovations and changes.

By implementing ethics into business, in fact, we are violating working but also life style of management (well-known practices of leading and managing). It is necessary to completely change, adjust existing way of communication, organization and management.

Management is risking the disapproval and impatience with the results of ethical tools implementation into company culture from the view of shareholders.

Management is worried that they will not be able to mobilize and positively stimulate employees for a needed cooperation.

Management very often encourages creative abilities of their subordinates and they overestimate organizational meaning of their own routine work.

Management is mostly concentrated on observing effects, processes and outputs which can be quantified. It is very difficult to calculate, show and summarize the level of moral, polite and correct behavior. Ethics and morale are not a part of aggregate macroeconomic model which has its own exact, mathematical basis (maybe unfortunately).

Implementing ethics into business requires complex and systematic approach, but the problem is to create it and personally ensure it. In the practice an approach based on resolution such as: "…so from now on we will behave ethically and morally! " definitely does not exist.

Management lives under the assumptions that everything about what they have to make a decision, they also understand; it is very often happening even in super effective organizations where this is considered as the most important phenomenon. Only "enlightened" management can publicly admit that they are not specialists for all areas pertaining to the functioning and operation of the company.

The management is not personally convinced that ethical behavior is going to pay off. This is completely logical and understanding approach, meaning that each cost (investment) of company is spent in order to receive later profit or return from it.

Management, in its ethical behavior, is not supported by a general public. The problem, which ostensibly should not have an influence on ethics level in organization. Nevertheless, if the feedback, public support, transparent need and willingness of company to be a part of ethical environment are missing, then the business subject does not have any interest in these changes.

In order to increase the level of ethical climate in companies and organizations it is necessary that the management (if interested):

- takes responsibility for processes of developing company's ethics, culture, business negotiation ethics and behavior of whole organization,
- uses consultancy and external company's services for ensuring company's policies and programs development,
- is more responsible for implementing ethical principles and standards into entrepreneurial activities of company,
- systematically monitors ethical state of company,
- is responsible for creating internal documents (code of ethics), directives and principles of business ethics,
- is responsible for ethical behavior training for employees,
- is the contact person in case of ethical problems and

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dilemmas,

- investigates in the context of violating ethics, complaints and sanctions,
- accepts and solves remarks of company's management and employees in the area of ethics,
- updates implemented company's ethical documents,
- plans, organizes, manages and controls projects in the area of ethics and social corporate responsibility,
- controls the compliance between company's values, objectives and strategy with projects in the area of ethics and CSR,
- ensures measurement, evaluation and reporting of organization's ethical state,
- is communication, organizational, operational link among employees, stakeholders and company's management in the area of ethics and CSR,
- integrates ethical aspects to other subsidiaries after merger or acquisition.

V. Conclusion

From the executed empirical investigation we have found partial, specific findings:

Almost absolute majority of respondents say that it is *very important and significant* to deal with ethics in business and management activities. Similarly, the respondents contended that ethics in business *has its justifiable benefits*. They also believe that ethical behavior will *pay off* to the companies and organization in the long term horizon. It is more than positive that respondents evaluate the role and the importance of ethics in social practice; however, it still remains more or less as the "sympathy" for ethics. Another, not entirely academic, but an apt expression is that everybody talks and discusses about ethics and its importance but nobody really does anything about it, more precisely nobody does anything that would at least partially improve this situation.

Respondents consider the behavior of enterprises in the Czech Republic *rather unethical*. It is also very worrying that respondents perceive this situation in the future as *deteriorating.* It is difficult to say what has caused this situation. Certainly, the level of current political corruption and instability, ongoing economic recession, overall deterioration of interpersonal relationships etc. contributed to this problem. This impression is also confirmed especially in the comparison with foreign countries; it is not only the business environment that the respondents evaluated at much higher level. Here comes into consideration the fact, how would the respondents react or what they would most probably mention in case of "heretical" question, such as: "By what specific activities, attitudes or behavior did they contribute to increase ethical behavior at their workplace or elsewhere?, or "What did you (yourself) do to make whole picture of ethics in society different, better?".

Respondents claim that the situation in the context of ethics in business continues to deteriorate, and the Czech Republic's businesses are behaving *rather unethically*. The evaluation and assessment of the level of ethics in organization, in which the respondents work, are less critical. They claim that their own company is behaving ethically. A certain inconsistency of these observations can be attributed to a certain level of anonymous answers. Respondents have the tendency to answer general, social questions more sincerely. Within the context of assessing their surrounding and specific environment the respondents are more tolerant.

In the context of ethics in companies and organizations, it was found that the ethical and moral level is *higher* in *international* or *multinational corporations*. As already mentioned, the degree of ethical climate in foreign companies is generally perceived at higher level. This is among other things due to a certain long-term social, political, economic and cultural development.

Over sixty percent of respondents work in an organization with purely Czech capital. This with the respect to the fact that higher level of ethics in foreign companies has certain value. From this information we can derive that if the respondents worked in an organization with mostly foreign capital (investor) we could assume higher level of ethics, resp. perception of level and ethic's evaluation.

From the series of questions it was found out that there is a higher occurrence of unethical behavior in *profitable* and *state organizations***.** By state company we understand organization in which the state is at least co-owner. The private and state sectors are colliding here. In this environment the respondents perceive the highest level of unethical behavior.

Potential benefits of ethical behavior of companies and organizations fully correspond with other, previously carried out research and studies. Among the major reasons for the introduction of ethics in business, according to respondents is: *company reputation, strengthening corporate culture, keeping skilled employees, competitiveness.* Other less significant reasons are: increasing product quality, sales growth and profit growth. How much are these reasons justified and important for effective company's operation remains a question.

Among the major ethical problems not only in the business environment, but in society as a whole, respondents perceive: *corruption* and *bribery*. This belongs (with respect to various social environments) to the most common socio- pathological phenomenon. Further problems were also registered: unfair treatment of employees, unfair sales and marketing practices, financial fraud, failure to comply with terms and conditions or poor quality of products and services.

The highest level of corruption is obviously seen in the *political sphere 78%*. Others troubled sectors include: construction *65%*, health services *50%*, transportation *43%* and industry *42%*, etc. this basically corresponds to the current Corruption Perception Index (CPI) with a rating of 4.4. The rate of this index ranks the Czech Republic in the EU and other developed countries at the bottom of the trend.

More than half of the respondents claim that a fundamental change to increase the overall ethical and moral climate in the

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Czech Republic is in the *way of thinking, politics, and people 57%*. This is largely associated with the political culture in general. So, the way the leaders present their image of ethical and moral patters of political life, the same way we, the citizens follow this pattern. Next, a lower percentage in changes is: *rigorous enforcement of law, respect for existing norms and laws and consistent control*. Interestingly, the improvement in ethics in Czech society is not, based on the results, a question of time (continual development of social changes) but necessary, fundamental, radical change is required.

As the greatest factor (condition) of successful business in the Czech respondents consider the *quality of the product*. Interesting is that in the previous question No. 9 poor quality products and services are with only 21%. Furthermore, it is about *prestige and reputation of the company, innovation, clear corporate strategy, network of contacts and friends or corporate culture*. The survey results only confirm the need, importance and sense of increasing company cultures in companies and organizations. This corresponds with necessary need to implement various ethical tools into business sphere. Actual business *ethics* as a factor of increasing success in business sees only *18%* of respondents.

Ethic rules, values or better the presence of ethical codex are *rather an exception* in the analyzed companies. Potential sanctions and penalties for breaching something which basically does not exist is very difficult. Research indirectly confirmed dependence between company's size and code of ethics. In large companies (approx. more than 300 employees) the presence of internal ethics document can be assumed more often. At the same time, the relation between code of ethics and company's origin is proven. The more the foreign capital is present the higher is the probability of ethical codex existence.

Business entities in the Czech Republic deal with violations of ethical rules and standards with difficulties. Respondents, themselves admit in most cases that they are not aware that their employer, supervisor, or management had ever dealt with ethical code violation. This may be due to the fact that de facto none ethical wrongdoing occurred or the issue is not specifically addressed. Only in exceptional cases unethical behavior was punished by a penalty, or even dismissal. This confirms the fact that some businesses, but also other organizations in the Czech Republic do not know how to proceed when ethical rules are disobeyed. This problematic is especially complicated if specific ethical directives are not implemented.

Next, also very important findings are that more than half of the respondents do not know, what CSR concept (Corporate social responsibility) means or what it represents. But in fact this concept is a typical example of ethics' application into business and managerial work.

APPENDIX

Based on the survey and its results it is evident that a radical change in terms of improving the ethical climate and moral awareness or corporate management is necessary. The situation is urgent. Managers should lead their companies in current market conditions to prosperity. This obviously will not happen without problems which they have to solve responsibly, they have to decide about them and they have to be held responsible for their decisions. Objective, responsible and ethical managerial decisions are complicated. Defined rules (phases) for ethical decision making within the organization can help the managers in their decision making [8], [9].

Applying ethics into business is not a fashionable trend although it can seem like this. It is some kind of "revitalization" of correct, transparent and responsible business which should become necessary condition for success – to become competitive. Managerial ethics increases business' transparency and it helps to overcome uncertainty in decision making about strategic goals in the context of economic and social phenomenon. Mentioned problematic of consumption does not have to be a fundamental social problem if it is "managed" in the context of economic responsibility.

In the context of other surveys we have to, unfortunately, admit that interest of management in implementing ethics into business is rather formal and it has never been high. It is necessary to realize that ethics and morality, more precisely its level is not an issue only for that particular company or institution but it reflects total level of ethical climate of society. It is abundantly clear and understandable that the goal of every company/enterprise is to satisfy the market requirements, fulfill economic objectives in the context of further development or sometimes even survive in the market, efficiently use existing capacity and anticipated sources of new investment and de facto continuous process of innovation support as a means of competitiveness. It is assumed that all this is happening in the context of ethics, morality and good governance procedures. But the reality is somewhat different. Many cases can be found and documented where strictly adhered ethics in business and managerial work "got" the company into bankruptcy, the competitive failure. It is not possible to be so short-sighted that we did not realize that the academic environment provides a place; space and time to deal with ethics, morality, conscience and other noble themes. There is a space to explore and investigate. The fierce market environment and competitive fight where businesses battle for survival is definitely not the ideal environment for an ethical "experiments ".

Nevertheless, we cannot accept the American slogan "Whatever is good business is good ethics." And yet we still believe that it is possible to "do" business fairly, honestly, solidly and still effectively. Due to the very theme and content of the work it is in principle more than undignified, degrading and desperate, that we have to deal and solve the question of ethics and morality. It should be a natural thing!

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There is a clear connection between the problematic of knowledge of management, companies, organizations and total level of morale in the society. Otherwise said, company's management but also their employees are a part of complete reflection of morale profile of a given company. From this point of view the analysis of ethics in business is fundamental.

Company's management responsibility creates some added value in the life of whole society. It increases not only the total level of a domestic company's good name, but in current, globalized, geo-economic place and also the position in international context. It cannot be ignored or underestimated if the companies realize their social role, significance and in what rate do they participate on total increase of national wealth. Logical connection among wealth, company's prosperity and wealth and prosperity of society is evident. Nevertheless, it should not be done for any price. In ethics and morality the liberal statement: laissez-faire cannot be applied. As a success in business we should not consider only production prices increase and company's cost decrease. If we talk about responsible and wanted results from business, then we think about all organization's activities which do not reduce their duties in case of satisfying the stakeholder's interests.

Ethics and its meaning in business and managerial work have been discussed for quite a long time; in our country as well as in many other developed economies. The meaning of ethics, resp. the interest in it is growing. This is especially due to the development of science, technology and information technology, which in the context of globalization presumes development of international cooperation. This development and building mutual relations is not possible without systematic ethical base.

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Misappropriation of Assets: Tales of Two Cities

Nafsiah Mohamed, Rozaiha Ab Majid, Rosmawati Haron, Betsy Jomitin, Nor Bahiyah Omar

Abstract – This paper presents the findings of a study comparing the results of survey on the possibility of assets misappropriation occurrences between two city councils. Data for this study were collected from two city councils in Malaysia. The results shown unethical behaviors are perceived as legal in both city councils. This study contributes significantly to the literature by presenting evidence on the likelihood level of misappropriation of assets to occur in local authorities. The findings from the survey and an interview revealed that misappropriation of assets were indeed a concern to the selected local authorities.

Keywords – Local Authorities, Misappropriation of assets, Fraud, City Council

I. INTRODUCTION

Local authorities are administrative offices that govern small areas in a state. Local authority plays a key role in indigenous economic growth and implementation of national development plans and policies of the government [1].Ultimately, the success of the local authority lies in the hands of its employees. However, the increasing number of fraud cases reported had long overdue wake-up call and local authority really needs to take considerable actions to put its house in order.

Fraud can occur at various levels of the organization. The wave of corporate scandals, beginning in 2001- 2002 with Enron, WorldCom, and others, led to the recognition that deficiencies too often existed in the governance and internal control systems of all types of organizations. Reactions to these deficiencies have resulted to Sarbanes-Oxley, and internal control audits under Section 404 which has witnessed to an increase in attention to the issues of governance, internal control, and fraud detection by auditors, management, and the broad investment community. While there have been many high-profile cases in the corporate world, the governmental and not-for-profit organizations are also not immune from major fraud.

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As challenges grow, the community in the public sector somehow has vague impression on the limit of acceptable and unacceptable behavior [2]. In a study conducted by [3] misappropriation of assets is indeed a concern in Malaysia's local authorities. In the study, the findings have shown an alarming sign of misappropriation of assets which has been classified to (highest score):

1. Vehicles; and internet connection
2. Computer equipment
3. Stationery
4. Telephone usage

It is also found that unethical behaviors are common sight among the employees and some perceived that the activities are legal. The consequences of this act are the employee's personal enrichment and the organization's losses [4].

Given the critical importance of this issue, this research has two-fold aims. This paper will examine opinion of employees on the issue of assets misappropriation and to explore the opinions of local authority employees on the issues. It is hoped that the findings are capable to offer certain highlights to the management of local authorities that such unethical behavior might survive. As such, appropriate actions can be outlined in order to curb the problems so that loss in assets and revenues can be reduced.

II. PREVIOUS STUDIES

Local authorities in Malaysia are given wide powers within the Local Government Act of 1976 [5] and are generally, under the exclusive purview of the state government. Its functions among others are, to plan and develop its area, to provide basic amenities, collect and manage waste and garbage. It has the power to collect taxes, to create laws and rules and to grant licenses and permits for any trade in its area of jurisdiction. The mission, objectives and functions of local authority have, in fact, undergone various degrees of reform, especially under the influences of various, complex changes in public policies, development strategies and initiatives [6].

The prevalence of serious misconduct in government and public sector, of which local authority is grouped under, was 56% [7]. This problem can also be observed from public disclosures of widespread questionable, negative and illegal acts of public officials [8] and increasing number of complaints received by Public Complaints Bureau. According to the bureau website [9], the statistics showed that the number of complaints received increased from 2941 in 2007 to 4059 in 2008. It seems that until September 2009, 9709 complaints have been recorded which is twice as many as the total complaints received in the previous year.

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Unfortunately, the victims most affected by acts of misconduct and misappropriation were the taxpayers with most, if not all, of tax imposed on them.

III. RESEARCH METHODOLOGY

We have elected two local authorities in order to fulfill our research aims. We choose to employ convenience sampling for the selection of local authority, which we made based on the descriptive results found by [3] and [10] in their studies. Their results have shown similar outcomes on misappropriation of assets regardless of total assets and total employees employed in local authorities all over Malaysia. This research was constructed through 2 phases; survey and interview. The questions relating to the studies were structured in Likert Scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

IV. ANALYSIS AND FINDINGS

We have distributed a survey to 300 employees; however, only 62 returned were usable.

Scenarios 1, 2 and 3 addressed the issues of the possibility of occurrences of misuse of assets through the perspectives of the respondents. The findings may provide evidence on the possibility of the occurrence of misappropriation of assets at the City Council under study.

A. Scenario 1: A council employee used a council vehicle to transport his/her children to and from schools

Result of Scenario 1 presented in Table 1 showed that 63% of the respondents from City Council A agreed that situation of an employee used an office vehicle to transport his/her children to or from schools is a common practice. According to the respondents, it is a common sight to see an employee used an official vehicle.

Table 1: SCENARIO 1: *An employee used an office vehicle to transport his/her children to and from schools*

		City Council A %	City Council B %
This is a common practice	Agree	63	56
	Neutral	23	22
	Disagree	13	22
My colleagues are doing the same thing	Agree	53	59
	Neutral	27	19
	Disagree	20	22
I think that is not against the law	Agree	0	3
	Neutral	20	10
	Disagree	80	87
My superior has given me the permission	Agree	10	3
	Neutral	20	31
	Disagree	70	66

Another question on whether the respondents had come across seeing their colleagues doing the same thing, 53% respondents agreed. Interestingly, 80% of them agreed that the scenario was against the law but there was no action taken against the employees. In addition, employees were given permission by their superior to use official vehicles for personal use (63%).

On the other hand, the percentage showed by city Council B is slightly lower as compared to City Council A. 56% of respondents from City Council B believed that the situation is a common practice.

B. Scenario 2: A council employee's daughter used council computer and printer to complete her coursework. She used the council papers when printing her coursework

Scenario 2 is regarding a situation that a council employee's daughter used council computer and printer to complete her coursework and she used the council papers when printing her coursework. 80% of respondents from City Council A considered it as a common practice whereas only 44% of respondents of City Council B agreed. Interestingly, 84% of them agreed that the scenario was against the law but there was no action taken against the employees.

Table 2: SCENARIO 2: *A council employee's daughter used council computer and printer to complete her coursework. She used the council papers when printing her coursework*

		City Council A %	City Council B %
This is a common practice	Agree	80	44
	Neutral	3	22
	Disagree	16	34
My colleagues are doing the same thing	Agree	90	50
	Neutral	3	22
	Disagree	6	28
I think that is not against the law	Agree	3	6
	Neutral	20	10
	Disagree	77	84
My superior has given me the permission	Agree	0	3
	Neutral	33	44
	Disagree	66	53

C. Scenario 3: *A professional council officer conducted private consultancies utilizing council office equipment and materials*

		City Council A %	City Council B %
This is a common practice	Agree	70	31
	Neutral	23	13
	Disagree	7	56
My colleagues are doing the same thing	Agree	53	34
	Neutral	33	9
	Disagree	13	56
I think that is not against the law	Agree	0	0
	Neutral	23	16
	Disagree	77	84
My superior has given me the permission	Agree	3	3
	Neutral	33	25
	Disagree	63	72

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Table 3: SCENARIO 3: *A professional council officer conducted private consultancies utilizing council office equipment and materials*

From Table 2, it can be seen that most of the respondents of City Council A believed that a situation that a professional council officer conducted private consultancies utilizing council office equipment and materials is a common sight at their workplace. However, only 31% of respondents of City Council B have the same opinion.

Based on the analysis of the findings from the three scenarios above, majority of the respondents agreed that the scenarios were common sights at both local authorities. They also agreed that they had seen their colleagues doing that. These results seem to be consistent with the results from [11], where 74 % of respondents agreed that they had personally observed or had first-hand knowledge of wrongdoings within their organization. The analysis of all these three scenarios showed that even though the respondents were aware that the scenarios were against the law, they would still do it if they were given permission by their superior.

This analysis provides evidences of the possibility of seriousness of the issue of misappropriation of assets in a City Council. This may be due to a lot of factors, among others, were opportunity to misappropriate the assets, ineffective internal control system, lack of awareness and level of fraud education among the officers. Remarkably, there were respondents who thought that the cases were not against the law especially in Scenario 1 and 2.

In order to find more evidences on this issue, the survey also inquires on respondent opinions toward the possibility of misappropriation of assets in the future. This could indicate current situation of misappropriation of assets, the appropriateness of existing internal controls and the action to be taken to remedy the situation.

Chart 1: City Council A: *The likelihood of misappropriation of assets occurring in the future*

A total of 65% of the respondents of City Council A believed that misappropriation of assets would very likely to occur in the future, most likely (28%) and not sure (7%). Not even 1% of them believed that the council would not be facing the problem in the future.

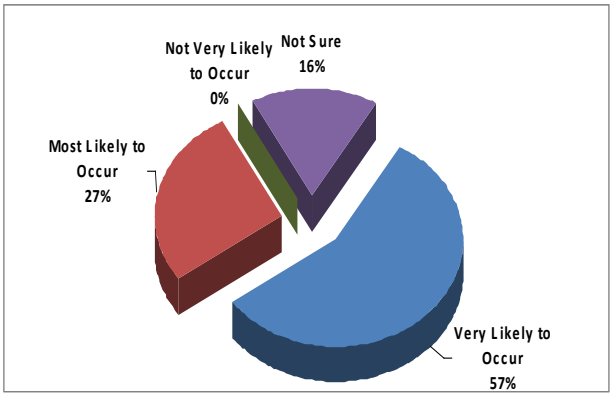
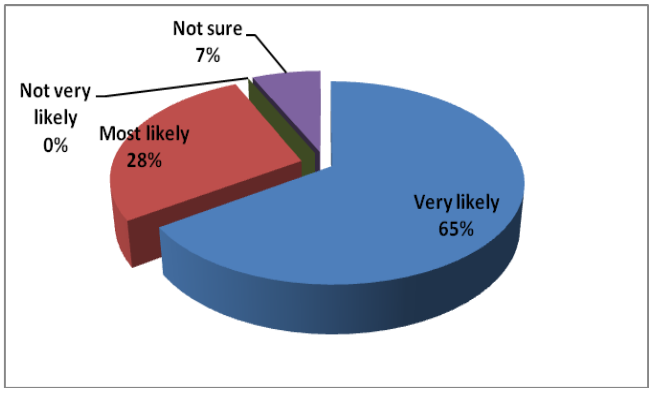


Chart 2: City Council B: *The likelihood of misappropriation of assets occurring in the future*

Respondents of City Council B also considered there is high possibility of misappropriation of assets occurring in the future with more than 85% agreed. A total of 65% of the respondents of City Council A believed that misappropriation of assets would very likely to occur in the future, most likely (28%) and not sure (7%). Not even 1% of them believed that the council would not be facing the problem in the future.



V. CONCLUSION

There is sufficient room to debate whether these two city councils faced problems of assets misappropriation by their employees. Based on the analysis, it can be concluded that there is a likelihood of the occurrences of misappropriation of assets in both local authorities; City Council A and B. Most of the employees of the City Council understood the seriousness of the acts of misappropriation of assets; however they were still doing it. The findings of the research can be an indicator of the level of the seriousness of misappropriation of assets of these local authorities as a whole.

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Challenges in Establishing, Managing, and Operating a Project Management Office

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***Abstract*—** The purpose of this study is to identify the challenging factors leading to the success or failure of the PMO establishment along with recommendation on how to address and overcome those challenges. Lack of a defined project management methodology, project resource contentions, not tracking resources utilization and project managers not being empowered to make needed decisions were found to be the top challenges in establishing a new Project Management Office.

***Keywords*—** *Project Management Office, Project Management, PMO, PMO Challenges, PMO Failure.*

I. INTRODUCTION

According to a research conducted by the Standish Group, only 16% of projects were successful with regard to time, budget, and technical specifications (Crawford, 2001). In a follow up research, the Standish Group had observed an increase in the success rate of projects from 16% to 26% (Crawford, 2001). Amongst the reasons offered for the improved success rate was enhanced project management and use of standard project procedures as a consequence of the implementation of the PMO. According to the State of the PMO 2010 survey, 84 percent of organizations are currently implementing PMO within their organization, a jump of 36% from the year 2000 (PMI, 2012). Organizations with PMO report more projects coming on time, on budget and meeting business goals. Having that said, it is not a straight forward process to establish a project management office within even the smallest firm. According to a research conducted by Gartner Research, Project Management Offices have a failure rate of 50 percent or more on their first attempt of establishment (Crawford, 2001).

II. PROJECT AND PROJECT MANAGEMENT DEFITION.

A project is the organization of people and resources to achieve a defined objective and purpose (Tuman, 1983). According to Pinto & Selvin (1988) a project is characterized by having a defined time for completion, limited budget, well defined and pre-set objectives, as well as a series of activities to achieve those objectives. As for project management; (Kerzner, 2003) defines it as the planning, organizing, directing, and controlling of company's resources to achieve specific goals defined for a particular project. According to the Project Management Institution (PMI, 2000), project management involves applying knowledge, skills, tools, and techniques to project activities to meet or exceed project's stakeholder needs and expectations.

III. PROJECT MANAGEMENT OFFICE DEFITION

The origin of PMO can be traced back to the 1930's (Singh & Keil & Kasi, 2009 p.411) and gained popularity in mid 1990s (Dai & Wells, 2004, p.526). The number of PMOs forming in organizations is increasing (Hobbs and Aubry, 2007; Hobbs et al, 2008; Spelta and Albertin, 2012). Through the literature, there have been various definitions of PMO and its implementations. According to the Project Management Institute (PMI, 2008), a project management office (PMO) is an organizational body or entity assigned various responsibilities related to the centralized and coordinated management of those projects under its domain. The responsibilities of the PMO spans from providing project management support functions to being responsible for the direct management of projects (PMI, 2008)

Authors tried to meet PMI definition of "Project Management Office", never the less, some of its entities were given different names such as Project Office (Kerzner, 2003; PMI, 2004, p.17), Centre of Excellence (Hill, 2004, p.50) or Centre of Expertise (Dai & Wells, 2004, p.524), Program Management Office (Rajegopal et al., 2007, p.27). Some authors noted that a universal definition for PMO is not possible due to the difficulty in customization of individual PMOs to fit all organizational needs (Desouza & Evaristo, 2006, p.415). The responsibilities of the PMO can range from providing project management support functions, to actually

being responsible for the direct management of a project." (2008, p.11)

Several organizations have established a Project Management Offices (PMO) in order to insure successful management and support of projects within their organizations. PMO provides a wide range of functions spanning form designing and maintenance of project procedures to strategic selection and initiation of projects in a matter that aligns with organizational vision and objectives (PMI, 2008) (Kerzner, 2009). The concept of Project Management Office (PMO) as an organizational entity came into shape in the late 1990s. Currently, the Project Management Office (PMO) is a well-established concept around organizations. The evolution of the PMO as a concept and important entity within organizations has continued to evolve to this day since the early days when the US Air Corps and later, the US Air Force, used Project Offices to assist with monitoring and controlling aircraft development projects during the Second World Word and Cold War periods (Benson, 1997).

In a two-year empirical study conducted by Dai and Wells (2004) to investigate the establishment and use of PMO, they found that 113 of 234 responses from a random sample reported having a PMO or similar entity within their organization. According to Dai and Wells (2004), the majority of PMOs were established in the mid-1990s to 2000.

IV. PROJECT MANAGEMENT OFFICE IMPORTANCE

As the number and complexity of projects throughout the business world has increased, the need to have a centralized project coordination functions has gone up. The popularity and expansion of PMO among organizations appears to be related to this (Dai&Wells, 2004). Organizations are increasingly implementing PMOs. Measuring PMO success is difficult, while some researchers adhere to its importance to making a project successful, some research (Stanleigh, 2006) found that 75% of PMOs in the IS domain shut down within three years of formation. Other researchers highlighted the frequent changes to the form of PMOs (Aubry et al, 2010a; 2010b). To determine how a PMO delivers business values, some authors examined the innovation in organizational project management (Dai & Wells, 2004; Desouza & Evaristo, 2006; Hill, 2004; Hobbs & Aubry, 2007; Hurt & Thomas, 2009; Kerzner, 2003; Martin et al, 2007)

In a 1994, the Standish Group conducted a research through which they found that only 16% of projects were successful with regard to time, budget, and technical specifications (Crawford, 2001). In a follow up research in 1998, they had observed an increase in the success rate of projects from 16% to 26%. Amongst the reasons offered for the improved success rate was enhanced project management and use of standard project procedures as a consequence of the implementation of the PMO. According to the State of the PMO 2010 survey, 84 percent of organizations are currently implementing PMO within their organization, a jump of 36% from the year 2000 (PMI, 2012). Organizations with PMO report more projects coming on time, on budget and meeting business goals. According to PMI's Puls of the Profession Survey (PMI, 2012), PMO helps reduce failed projects, delivering projects on/under budget, improve productivity, deliver projects on/ahead of schedule, and increase cost saving. Having that said, PMO case of failure starts when the value of PMO within an organization is being questioned due to the fact of having projects not being completed and delivered within the defined sets of objectives ranging from budget, time, and deliverables. For the PMO to not deliver results is one form of failure; but not communicating PMO results upward is one of the main reason several organizations have the perception of a failing PMO (PMI, 2012). According to the State of the PMO 2011, only 15% of project managers who report to vice president of IT believed their firm acknowledges the value of PMO. In addition, 70 % of respondents to the Global State of the PMO study (2011) said that the PMO's value was questioned among senior management. Furthermore, some authors attributed to PMO performance dissatisfaction to internal politics and power systems (Aubry et. al., 2010A)

V. RESEARCH STUDY

In this study, a group of project management professionals that have been part of an initiative to establish a PMO within a software development firm have been questioned about the challenges they have phased during their effort setting up the new PMO. At the time of the study, it has been over three years since the PMO establishment. The PMO was an initiative sponsored by the CIO to enhance the management and delivery of many struggling and low performing software and IT projects within the organization. In this firm, the project organization is a matrix one in which project managers work with project teams whose resources are pooled from various functional departments such as Software Engineering, Software Quality Assurance, Implementation and Support, and Product Development. The PMO challenges that have been surveyed in this study are:

1. Lack of a defined project management methodology
2. Not tracking project's resources hours and utilization
3. Project managers not managing all aspects of projects
4. PMO is not empowered to make needed decisions
5. Resource contention
6. Lack of a defined project management methodology framework
7. Project managers managing several projects simultaneously
8. Lack of executive and top management support

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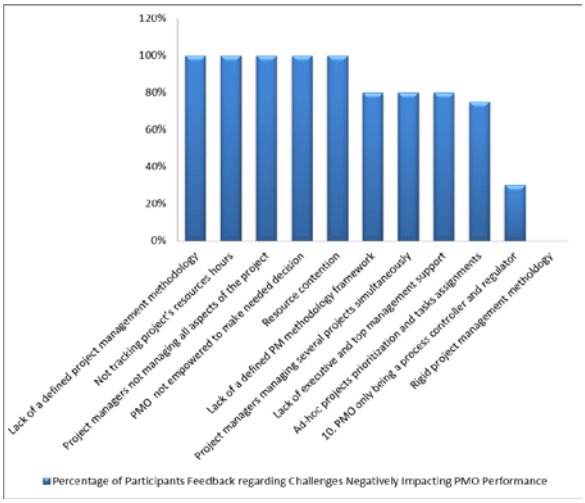
9. Ad-hoc projects prioritization and tasks assignments
10. PMO is only being a process controller and regulator
11. Rigid project management methodology

VI. STUDY RESULTS

The results of the study regarding the challenges in establishing a project management office and leading to either its success or failure are presented in Figure 1.

Figure 1: Study Results with regard to Project Management Office Challenges



VII. ANALYSIS RESULTS

Below is the list of the PMO challenges surveyed in this study sorted by the percentage of feedback reported by the study participants.

1. Lack of a defined project management methodology. 100% of participants reported this as a factor negatively impacting the performance of the PMO.. Not implementing a standard and well defined project management methodology within the project management office is a major contributor to the failure of the PMO. Not having a well-defined methodology and practices leads to inconsistency in managing and controlling projects. Consequently, reporting and visibility into projects status and portfolio becomes a challenge and constantly a moving target that is never attained

2. Not tracking project's Resources Working Hours. 100% of respondents reported this as a challenge in meeting the PMO objectives. For the PMO to be able to provide metrics-based analysis of resources there should be a mechanism and a system to track actual time worked on actual projects and other work. Without this it is impossible to identify the true capacity of a resources working on a project, consequently leading to failure in meeting projects estimated schedule and cost.

   100% of project managers not managing all aspects of the project reported this as a challenge negatively impacting the performance of the firm's PMO. This is mostly a challenge that should be addressed when working in a matrix project organization. The matrix organization structure brings many benefits to an organization through the utilization of cross-functional teams that are working to support a common project. Having that said, a matrix project organization has several challenges. Project managers competing for the same resources can lead to conflicts leading to set backs in project schedule and performance. In a matrix organizations, both the functional manager and the project manager should be in constant and tight communication to insure alignment of project objectives and obligations along with functional departments ones. Resource availability and commitments is one of the most difficult challenges to overcome without a matrix structure.

3. The PMO is not empowered to make needed decision. This is so much related to the need of having constant and persistence top management and executive support to the PMO. 100% of participants have reported this as a challenge negatively impacting the performance of the PMO.
   By not having an active executive support, the PMO is not empowered to make the needed decision. While it is important for the organizations executives to demonstrate their support both at the initiation phased and throughout its lifecycle, it is also equally important for the PMO to be seen as an enabler of the business. The PMO should be felt as an independent body challenging the status quo, rather than as an approving body to all executives' decisions.

4. Resource contention. Resource contention in project management is a conflict over access to a shared resource especially when this resource is needed to complete a task that is on the project critical path. 100% of respondents reported this as a challenge they phased during the start up

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of the PMO within their firm. In most cases, resource contention leads to delays in projects delivery and schedule consequently impacting the effectiveness of the PMO performance. There are several factors that can lead to project's resource contention such as inadequate on incorrect resource forecasting, conflicting resource priority, inadequate information on what and when resources are available, not enough skilled resources, and too many unplanned requests for resources. One of the most challenging reasons leading to resource contention which was dominant in the feedback of this study participants is the presence of a significant disconnect between the PMO and decision makers who assume that there are enough resources for all projects when, in reality, there often are not. Resource contention challenge is highly related and impacted by both challenge 2, 8, and 9.

5. Lack of a defined PM methodology framework
   This challenge is mostly applicable to the PMO that is established within IT and software development organizations since the integration between the Software Development Life Cycle (SDLC) and project management methodology is usually not straight forward. 80% of respondents reported this as a challenge. An overall project management framework with the basic phases and gates and a few key controlling artifacts such as business case, project schedule, status report, etc. should be defined and agreed upon between the PMO and the software development related departments. This is sometimes known as a PDLC (Project Development Life Cycle), and many different SDLCs can fit under the framework, tailored to the needs of the project type.

6. Project managers managing several projects simultaneously. One of the major factors that lead to a perception of PMO failure is not being able to deliver projects as planned. A major factor contributing to this is the PMO managing number of projects more than it can handle. This happens as a result of not being able to prioritize projects according to demand and supply (Challenge 9) and also not being able to estimate the load of a department or team due to the lack of metrics-based understanding of resource capacity (Challenge 2). 80% of respondents reported this as an obstacle phased within the PMO. The number of projects a project manager can hand simultaneously depends on several factors including the organization culture, the maturity of the project and organization teams, project manager skills, complexity of project, and project phase. The PMO should consider all these factors when having its project managers managing several projects simultaneously.

7. Lack of executive and top management support. Not having executive support is one of the major challenges facing the success of new PMOs. 80% of respondents reported this as a challenge they phased. In practice, executive teams are the ones authorizing the establishment of the PMO to address challenges faced within their organization in delivering and executing projects. There are various ways through which executive team should show support to the PMO organization and its members and processes. For instance, top management should attend steering committee meetings, embrace the PMO processes and methodology, and empower the PMO and its PMs by giving them decision making authority. One of the worst things an executive can do is to undermine the authority and power of the PMO by overriding a PMO decision which have been reported to be one of the dominant behavior top executives demonstrated their lack of PMO .

8. Ad-hoc projects prioritization and tasks assignments. Accepting and authorizing new projects to be managed and supported by the PMO should not be performed in an ad-hoc or informal matter. 75% of participants reported this as a PMO challenge. Ultimately, ad-hoc authorizing of projects leads to failure of projects due to the lack of available resources and conflicting priorities. Most of the time, accepting new emergency projects trumps already running projects leading to a serious project block. The process of accepting and prioritizing new projects should be done periodically along with all new projects requests along with the currently running projects.

9. PMO only being a process controller and regulator. The necessity and importance of having a PMO methodology to manage projects should not lead into falling into the trap of being only a methodology controller. 30% of participants reported this as a PMO challenge. The objective of the PMO should be to work on following the methodology in order to aid and guide project management practices to insure consistency of project execution and reduce risks resulting from complex projects and inexperienced project managers. By just blindly enforcing methodology without paying attention to individuality of projects and people, the PMO is risking

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resistance and lack of process embracement among other departments.

10. Rigid project management methodology. It is very important for the PMO to implement a project management process that is flexible especially at the start of PMO implementation. This is important to insure better change manageability within the organization and absorb any resistance of the new PMO and its new adopted project management process. For the PMO to insure proper alignment and collaboration among organization's teams and functions is crucial, and this is not possible to take place if the PMO taking a very rigid approach with regard to the newly defined project management method implemented by the PMO. The PMO should encourage collaboration among project professionals and various functional departments within the organization the PMO is serving. In this study, none of the participants reported this as a challenge which is correlated with the fact that 100% of participants reported the lack of project management methodology as a challenge. In this firm, the fact that there was no standard and defined project management methodology, lead to a form of undesired flexibility in project management.

When asked of the top challenges contributing to the failure or partial success of their PMO organization, the participants have reported both lack of defined and standard project management methodology and not being empowered to make needed decisions as top factors. Table 1 summarizes the details of participants' responses regarding top factors or challenges leading to PMO failure.

The top challenges crippling PMO performance	Participants feedback
Lack of a defined project management methodology	80%
PMO was not empowered to make needed decision	80%
Conflicting projects prioritization	60 %
Ad hoc projects and tasks assigned to resources	20 %
PMO only being a process controller and regulator	20 %
Lack of executive and top management support	20%

Table 1: Top Challenges leading to failure of PMO

Conclusion

The role of the Project Management Office (PMO) in organizations continues to be a topic of great interest to project management practitioners. Yet, for many organizations a struggle exists to define the PMO role, to position the PMO for long-term success, and to leverage the PMO to support achievement of the organization's tactical and strategic objectives.

This study has surveyed the challenges faced while establishing, managing and operating a PMO in a software/IT firm. The surveyed firm had its PMO organization for three years at the time of the conducted survey. The PMO was setup to manage the organization's software development, delivery, and implementation projects. The organization had a matrix project organization in which projects resources were pulled from various departments such as software engineering, quality assurance, technical writers, implementation engineers, and product development. The PMO was setup to report to the CIO. In this study, all the surveyed project management practitioners reported that the PMO was partially successful due to several encountered challenges.

According to the findings of this study, the main challenges encountered while operating and managing the PMO were related to the lack of a defined and standard project management methodology, not tracking project's resources utilization, not being empowered to make project's needed decisions and PMO not being able to manage all aspects of projects due to conflict with functional managers and departments specific priorities. In addition, resource contention with other projects and tasks was reported by all study participants as one of the main PMO challenges. Moreover, when asked to indicate the top three challenges facing the PMO, 80% of practitioners reported the lack of defined project management methodology, and not being empowered to make projects needed decisions as top factors. As for the conflicting projects prioritization, 60% have reported it as one of the top three challenges.

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