IT Initiative for Creative Interactive Teaching Presentation based on IT Blueprint Framework

Maria Seraphina Astriani, Satrio Pradono, and Jurike V. Moniaga

***Abstract*—** The world is evolving, the way of live is shifting into digital age and people are evolving in terms of knowledge because of the present of technology. Traditional teaching methods like we used to have, while we were in school, are now longer accepted by today's learners. We live in digital era, where everyone wants something efficient, effective, dynamic, fast and interactive. Traditional teaching method where the teacher is delivering the materials to students by using presentation slides is no longer interest the students. They demand something more advanced, more interactive and more attractive to gain their attention to learn better. Teacher and school will need to make something interesting by using information technology, like interactive presentation.

***Keywords*—**interactive presentation, interactive teaching, IT Blueprint framework, IT Initiative.

I. Introduction

BECOMING a teacher is not as easy as it used to be. Before, there are no options for the students other than to accept any materials from the teacher whether the teaching style is boring and make the subject is unattractive than it already is. Before, both teacher and students have no references of how to make a better teaching and learning process. Now, since the internet is becoming an integral part of our life as we are depending on it every day, students can see other teaching styles from around the world that they believe it will gain more interest for them. With this condition, teacher needs to improve their teaching style or presentation to be more interactive and creative to gain student's attention.

As the internet playing an important role in our daily live, we cannot avoid our dependency of IT is increasing aggressively. Not only in the education world but people are now realize that to achieved all those things they need is to implement IT system, because IT has a significant impact in our daily life. The main involvements of IT in the company or school are to increase the efficiency, effectiveness, and competitiveness [1] and same approach are used in education world. Comparing with the previous generations of students, the digitally-native students tend to be more active experimental learners, more proficient in multitasking, and strongly dependent on communication technologies for accessing information and for interacting with others. In order to reach the generation's potentials, the previous research has proved that an interactive learning tool is more favorable in order to create enjoyable and interesting interaction to boost student motivation [2].

Since today's students are demanding something more interactive and creative from the teacher because they believe that they will learn much better. Today, most of the education institutions are not supported with a decent Information and Communication Technology or ICT system that can support both the business aspect of the institution as well as the teaching and learning aspect [3]. They still use the old traditional method of teaching where the teaching and learning process is dominated with one-way communication mode. In this mode, the lecturer explains the teaching materials meanwhile the students take the notes and try to comprehend what the teacher has explained and the interaction between teacher and students is missing. The above teaching and learning method is often ineffective and resulting on a condition where the teaching process becomes ineffective and demotivating the student learning [2]. These problems are initiated from the fact that the traditional method is less interactive between the both parties. The current teaching and learning method should be revised to align with the current young people adeptness of technology. Therefore, the problem lies ahead is that there is an urgent need to change the teaching and learning delivering method [4].

II. Method

Student interactivity is defined as the student's ability to response continually [3]. According to Hsu [2], interactivity has long been identified to contribute to successful teaching and learning. Because of that reason to solve the problem, we need interactivity in teaching and learning to create better environment to be more active and dynamic. Below is the method to create interactive learning environment.

Although IT Blueprint based on best practice, making IT Blueprint requires basic methodology that also includes the 5 aspects [3][5][6].

These steps are: (1) what is the vision? Define the vision to know what the goal is; (2) where are we now? Make a self-assessment to get a picture where is our current position for in terms of technology environment; (3) Where are we going to be? This step is to define are there any potential technologies

M. S. A., S. P, and J. V. M are with Bina Nusantara University, Jakarta, Indonesia. M. S. A and J. V. M are in School of Computer Science and S. P is in Computer Science department (e-mail: seraphina.astriani@gmail.com, satrio.pradono@gmail.com, and jurike@binus.edu).

that possible to be used in education to reach the vision. (4) How do we get there? To create Creative Interactive Teaching Presentation, we need to analyze: (a) Requirement gathering, (b) List of features, (c) Implementation plan; (5) how will you know when you get where you want to be? To know where our current position is, we need to make a tool to monitor our steps and time frame.

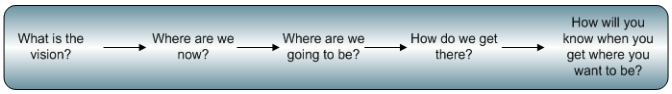

Fig. 1 basic methodology overview

Combining the basic methodology as well as the 5 pillars [7][8][9] as the basis for IT project to translate from the company or school's business processes, IT Blueprint Framework is formed by the following figure:

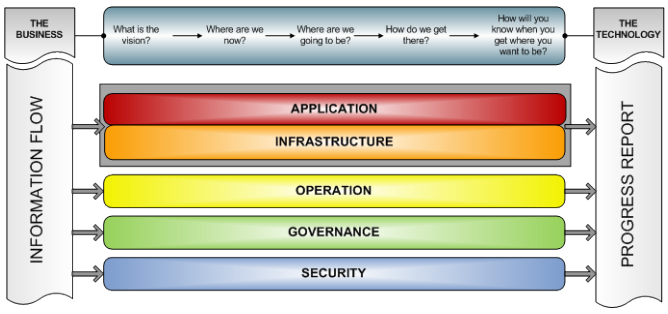

Fig. 2 IT Blueprint framework

IT Blueprint Framework of the above can be seen in the form of input called Information Flow (The Business) and its output is called Progress Report (The Technology). To obtain the Information Flow diagram it is necessary to analyze the company or school's business processes. This diagram will used to support the application and the infrastructure pillar. To see all the changes that occur with the implementation of IT Blueprint, we need Transition Matrix, which will show us the transformation of the IT system from IT project in a specific period of time. In this study, has been compared by researcher [3][5][10], Transition Matrix will have a transitions on the Where are We Going To Be? - Define Future so from the beginning of the IT project we will have a clear picture of the targets that should be done.

IT Blueprint does not require companies to use the most advanced or sophisticated and the most expensive technology to improve efficiency and effectiveness, but more likely to see which one is the most suitable technology and in accordance with the vision and mission of the company or school. In addition, the IT Blueprint also need to know the existing business processes within the company or school [5].

III. IT Blueprint

Approximately 50-80 % of IT projects fail because the project is over budget, needs that are not accommodated and there is no user acceptance. The implementation of technology in IT projects is in the gray area, there are no exact theories that explain this methodology clearly on how the implementation of IT projects in the real world should be done. Insufficient time or funds, unacceptable requirement, technology, governance, testing, and poor project management are always be the scapegoat in project failure. Why project failures are keep happening? Because operate without a full and clear Blueprint [11]. The fundamental difference between IT with other engineering disciplines is the lack Blueprint [11].

Traditional development is characterized by the following [3]:

- Requirements continuously change, adding time and cost
- Multiple versions, are required to deliver all requirements, taking years to deliver the final product
- The user interface inevitably does not work as people work, requiring constant tweaks and enhancements to get it right
- The business is forced to change its business practices to suit the technology, not the other way around.

The IT Blueprint fits into traditional development lifecycles and methodologies and also works equally well with new and existing applications. IT Blueprint can deliver [11]:

- Communication of functional and non-functional requirements
- A clear line of sight between strategy and application behavior
- Choice of the right technology solution
- Vendor accountability to the IT Blueprint
- Certainty of outcome
- On budget, on time and usable technology
- The application works properly on the first time

Referring to the previous research on the benefits of manufacturing and IT Blueprint [3][5][12], the IT Blueprint will continue to play as a leading role in implementing IT projects. This study will focus on ways of making IT Blueprint in general as a foundation to build IT projects within different company or school and it will produce a different IT Blueprint and by having and implementing this, the company or school will have a strategic solution as their IT project.

To start developing the IT Blueprint, organization’s vision is needed as the base of IT Blueprint methodology.

Business process will be translated into information flow in the system. In future, the information can be obtained more quickly with centralized data [3].

Comparison of the figure below will give clearer picture for what we don’t have now and what will we have in the future.

To conclude all the future targets, transition matrix is created to let the organization know on which way they transform.

ISBN: 978-1-61804-238-5

Consolidate			Integrate System
System		Interactive Presentation	
Requirement	Data & Environment Preparation		
	Period I	Period II	Period III

Fig. 3 Transition Matrix

IV. Implementation

Based on IT Blueprint framework, as a starting point, vision is required to set our target. Vision is the key to deciding the "where are we going to be" [5].

After the vision is determined: "Creative Interactive Teaching Presentation", the next step is defining current IT conditions. The things to do on this step are list all the IT devices and understand-analyze current IT situation. SWOT, SWOT matrix (IFAS, EFAS), and CFS can be used as a tools to help defining current conditions [12]. This is the example of the IT current conditions: each class room has 1 computer (LCD monitor, keyboard, mouse, RAM, hard disk, graphic card, HDMI port, etc.) and 1 projector.

Based on the current IT situation, future will clearly defined as listed below

Before	After
Presentation slides	Interactive presentation
Navigate using tools: mouse, keyboard, or presentation remote	Navigate using motion gesture
Can not move freely (because need to use the tool(s))	Can move freely
Less enjoyable	Enjoyable
Less interesting	Interesting

Fig. 4 comparison

Analyze from figure 4 and current IT situation, it will give clearer picture of what we don't have now and what will we have in the future.

Infrastructure	
Needs / Target	Solution
Device for detect motion gesture	Motion capture device
Network	Connect computer with motion capture device
Platform environment	Computer with required specification of motion capture device
Applications	
Needs / Target	Solution
Create interactive presentation	Interactive presentation software that can detect motion gesture
Software Development Kit	Computer with motion capture device SDK

Fig. 5 needs and targets example

Information flow diagram created after define the business process. It joint the future needs (application) and business process to represent the flow of information for future application [12]. This is the example feature of information flow diagram: Hand gesture: shove left, then call next_slideshow() function. To help define the tasks, Hierarchical Task Analysis (HTA) can decompose tasks to subtask / subgoal [13]. Following is the example of HTA:

0. Navigate Interactive Presentation Slide
1. Check the system
    - 1.1. Check display
    - 1.2. Check device indicator
2. Stand approximately 1 meter towards device
3. Navigate and operate slides
    - 3.1. Choose presentation slides
    - 3.2. Navigate the slides
        - 3.2.1. Shove left
        - 3.2.2. Shove right
        - 3.2.3. Shove up
        - 3.2.4. Shove down
    - 3.3. Choose
        - 3.3.1. Pinch
        - 3.3.2. Close palm
        - 3.3.3. Open palm

IT Initiative will help the way to achieve targets. IT initiatives is a roadmap of what should education institutions implement for meet the future IT. The Each IT initiatives are sort based on urgency, important, cost, and time, and categorized by people, process, and tools. This is the final result for IT Blueprint. Based on this IT Blueprint, they will know which one they should implement first, if they have the budget [12].

These are the example of IT Initiative based on Transition Matrix:

	!	^	$	~
Motion capture device	!!!	^^^	$$	~
Network - cable	!!	^	$	~
Complete the computer specifications	!!	^^	$$$	~~

Fig. 6 IT Initiative - Infrastructure

	!	^	$	~
Interactive presentation software	!!!	^^^	$$$	~~~
SDK	!!!	^^^	$	~

Fig. 7 IT Initiative - Application

	!	^	$	~
Installation	!!	^^^	$	~
Software training	!!	^^	$	~

Fig. 8 IT Initiative - Operation

	!	^	$	~
Disclaimer	!	^	$	~~

Fig. 9 IT Initiative - Governance

	!	^	$	~
Real-time PC protection	!	^	$	~~

Fig. 10 IT Initiative - Security

ISBN: 978-1-61804-238-5

!	^	$	~
! = Less Important	^ = Not to Urgent	$ = < $99	~ = Less than 1 week
!! = Important	^^ = Urgent	$$ = $100 - $499	~~ = 1 week – 1 month
!!! = Very Important	^^^ = Highly Urgent	$$$ = > $500	~~~ = more than 1 month

Fig. 11 legend of IT Initiative

To create the interactive presentation software, researcher using Microsoft Kinect device and Kinect for Windows SDK to implement motion gesture to navigate the slides. Minimum specifications of computer (infrastructure) to runs this interactive presentation are Dual Core 2.55GHz Processor, Dedicated USB 2.0, and 2GB RAM. And the minimum requirements of the software (application) are Windows 7 (32 or 64 bit), .NET 4.0 Framework, Kinect SDK Beta, and Microsoft DirectX SDK.

Figure 12 illustrate the application environment of interactive presentation.

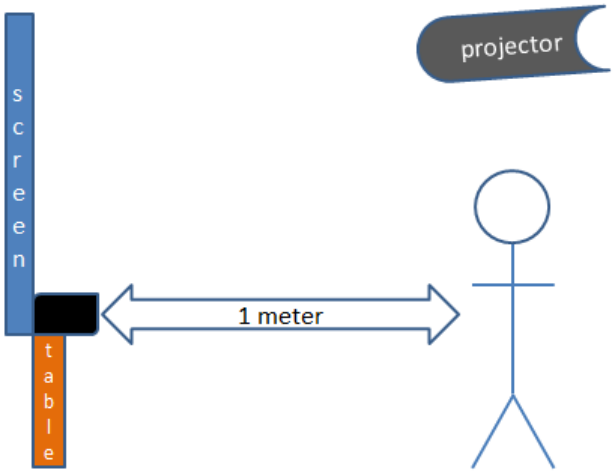

Fig. 12 application environment

V. Conclusion

Teacher needs interactivity in teaching and learning to create better environment to be more active and dynamic. By using creative interactive teaching presentation, teacher can improve their teaching style or presentation to be more interactive and creative to gain student's attention.

To develop a success interactive presentation application, the implementation of IT Initiative in IT Blueprint framework is needed to reduce the failure the IT project.

References

[1] S. Fahmy, A. R. Hamdan, and A. Deraman, "IT in Education Organization: A Strategic Planning Approach", *Informing Science + IT Education Conference*, Ireland, 2002, pp. 441-449.

[2] Hsu, H. J., The Potential of Kinect as Interactive Educational Technology, *2nd International Conference on Education and Management Technology: IPEDR 13*, 2011.

[3] Astriani, M., S., Pradono, S., IT Blueprint and School, *Proceedings of the 10th WSEAS International Conference on Computational Intelligence, Man-Machine Systems and Cybernetics, and Proceedings of the 10th WSEAS International Conference on Information Security and Privacy*, Jakarta, Indonesia, 2011, pp. 160–167.

[4] Bennett, S.; Maton, K.; Kervin, L., The 'digital natives' debate: A critical review of the evidence, British Journal of Educational Technology 39 (5), 2008, pp. 775–786.

[5] Astriani, M., S., "IT Blueprint – Jembatan Bisnis dan Teknologi", *Binus Information Communication and Technology Conference*, 2011.

[6] Cassidy, Anita. *A Practical Guide to Information Systems Strategic Planning*, 2nd Ed. Auerbach Publications, 2006.

[7] Community Colleges Computer Services. *Information Technology Master Plan*. Community Colleges of Colorado, 2006.

[8] Orange County Community College. *SUNY Orange: IT Governance Information Technology Master Plan*. SUNY Orange, 2005.

[9] de Vries, M et al. Evaluating and Refining The 'Enterprise Architecture as Strategy' Approach and Artefacts. *South African Journal of Industrial Engineering*, vol 20(1), 2009, pp. 31-43.

[10] M. S. Astriani, S. Pradono, and J. V. Moniaga, "IT Blueprint Using IT Initiative Implementation in Book Store to Support E-commerce," *The 3rd International Workshop on Soft Computing and Disaster Control*, 2003, pp. 15-19.

[11] P. R. Kuruppuarachchi, P. Mandal, and R. Smith, "IT project implementation strategies for effective changes: a critical review", Logistics Information Management, 2002, vol 15, pp. 126-137.

[12] M. S. Astriani, S. Pradono, and H. Saragih, "IT Blueprint for Education Institution", Jakarta-Indonesia, *Advances in Computing, Control and Telecommunication Technologies (ACT), 2010 Second International Conference*, 2010.

[13] Diaper, D., Stanton, N. (2004). *The Handbook of Task Analysis for Human-Computer Interaction*. *Lawrence Erlbaum Associates*. Mahwah, New Jersey..