Delivering an Interactive Presentation in Supporting of Dynamic Teaching Method with an IT Blueprint Framework: IT Initiative-ITBluTric

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Abstract— **Education and technology have a very close relationship and it cannot be denied. Education is now very depending with technology and always keeps evolving to support each other. Teaching methods are now drastically change because the present of rapid development of technology. The way of teaching is now shifting due to the available technology and the students, parents and the society no longer accept the conventional teaching method, which is one-way communication. Presenting any materials with the help of technology, increase the successful rate of delivery of the materials and also increase the student's understanding. IT Initiative in IT Blueprint framework is one of the method to reduce the failure of the IT project (developing interactive presentation) but it still lack to measure the IT Initiative. The new measurement method in IT Blueprint called ITBluTric is needed to become a success factor while developing the interactive presentation.**

Keywords—Interactive Presentation; IT Initiative; IT Blueprint; ITBluTric

I. INTRODUCTION

Conventional teaching style is not the option anymore for the teacher. Before, must accept any materials from the teacher whether they like it or not. Traditional method is most often criticized in teaching process [1]. Students usually insufficient to do some activities that related to learning process, teaching individualization and intuition is inadequate and not dynamic enough, students do not received a continuous feedback on their achievements, and many more [1]. Since the internet is becoming an integral part of our life as we are depending on it

every day, teacher can find ideas or reference about teaching style that give students more opportunities to gain more knowledge. With this condition, students are enjoying themselves at school and because their enjoying their time, they will absorb more knowledge and lead them to be more active in each lesson.

As our daily life is very dependable on technology, we should accept it that our dependency of IT is increasing very fast. People are now realizing they need to implement IT system, because IT can help us in our daily life. The main involvements of IT in the company or school are to increase the efficiency, effectiveness, and competitiveness [2]. By comparing the current students with the former students, the current students, who are digitally-native students, are tend to be more active experimental learners, critical thinkers, and very dependent on communication technologies for accessing information and for interacting with others [3]. To help them to reach their potentials, one of the research has proved that an interactive learning tool is more favorable in order to create enjoyable and interesting interaction to boost student motivation [4]. With technology, electronic text books that has the multimedia elements: text, pictures, sounds, animations, and films can be created to help all learners have a freedom to study the teaching contents individually. Learners can receive feedback, return or search which contents that are not clear enough, and search for additional information based on their own capabilities and interests [1].

Interactive and creative are something that the students demand from the teacher because they know that they will gain more knowledge through the lesson. Until today, most of the education institutions don't have 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 [5]. One-way teaching styles are often still used by them and teachers are still dominating every lesson. In this teaching style, there is not much interaction between teachers and students or discussion while the students are only taking notes during the lesson. 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 [4]. This condition caused because a very less interaction between the teacher and the students during every lesson. The current teaching and learning method will 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 [6]. Knowledge exchange on teaching process is a very complex process; although Internet makes the information is possible to be exchanged at high speed rates, knowledge sharing and know-how broadcasting is still an open problem that is waiting for suitable solutions [7]. Interactive teaching is a communicative and dynamic teaching, which is a relatively recent process to motivate learning so as to develop critical postures on future engineers concerning the contents they are being taught [8].

To create a better environment in the class, interactive presentation should be added. Developing the IT project, especially on this case: developing the interactive presentation, is not as easy as it thought and a method is needed to make the successful project rate increased. The IT Blueprint method is needed as a guidance, but the problem is how to determine the measurement in IT Initiative process because IT Blueprint do not have any fix rules to determine and sort the pillars (Application, Infrastructure, Operation, Governance, Security) based on urgency, importance, cost, and timeframe aspects. [5], [9], [10]. Based on the research, new IT Blueprint measurement is discovered called ITBluTric and it helps to determine the order of the processes in IT Initiative.

II. IT BLUEPRINT AND ITBLUTRIC METHODS

To create a better environment, interactive presentation should be added in the class. To create the interactive learning environment, we need helps from IT Blueprint framework, especially in IT Initiative steps with the combination of usability metric as the measurement. Below is the explanation of the methods.

A. IT Blueprint

IT Blueprint is based on best practice. But the state of the art of IT Blueprint requires basic methodology which includes these 5 aspects: what is the vision, what are we now, where are we going to be, how do we get there, and how will you know when you get where you want to be [5], [9], [10].
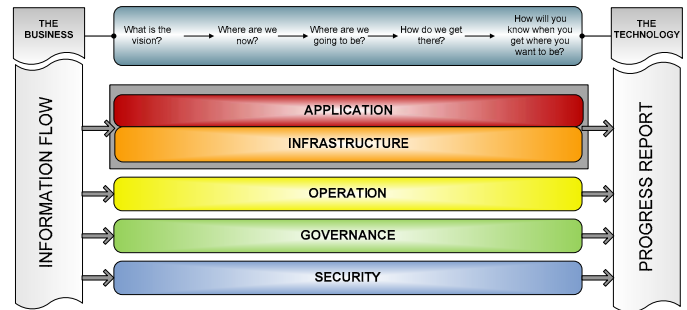
IT Blueprint framework

Below are the explanation how develop an IT Blueprint [6], [9]:

1) Define vision

   While developing the IT Blueprint, vision is one of the key to be set as the target. The key points of vision: need to understand their mission and vision and also the business condition, identify and describe their objectives, goals and scopes, allocate and list all the resources, roles and responsibilities, and interviewing all important staffs, and analyze and identify the business trends, B2C requirements.

2) Define current

   These are the steps to determine current situation of IT: analyze their current IT situation based on application pillar, infrastructure pillar, operation pillar, governance pillar, and security pillar, and make reports based on the current situation.

3) Define future

   Vision and objectives are formulated into the future IT system to support teaching and learning process.

4) Analyze the Business Process

   Business process needs to be analyzed to make a proper IT Blueprint.

5) Define information flow

   The result from analyzing is information flow diagram. It will support application and infrastructure pillars.

6) IT Initiative

   Application, infrastructure, operation, governance, and security pillars are the aspects of roadmap for developing an IT Blueprint to help achieve the goals. These aspects should be included and measured in IT Initiative [5]. ITBluTric should be added as metric for

a measurement to create 5 pillars of IT Initiative based on urgency, importance, cost, and timeframe.

B. ITBluTric (IT Blueprint Metric)

Determining the IT Initiative will be quite complex if there is no metric because each pillar need to be defined based on the requirements and the conditions on each IT project. People will confused and mislead which process should be done on the first place, which process can be delay, and which process should be done sequentially. The fix rules should be added to measure the process in IT Blueprint called ITBluTric. The measurements cover 4 aspects: urgency, importance, cost, and timeframe that should be measured to determine the order of the IT Initiative process that should be done.

TABLE I.   LEGEND

Urgency	Importance	Cost	Timeframe
^ = not to urgent	! = less important	$ = small	~ = less than 1 week
^^ = urgent	!! = important	$$ = medium	~~ = 1 week – 1 month
^^^ = highly urgent	!!! = very important	$$$ = much	~~~ = more than 1 month

1) Urgency

Urgency is something should be done on the first place. If the IT Initiative process has the higher point among the other, it means the process should be done as soon as possible than the other processes. Based on the paper by Jones [11], there are Risk Metric and Software Usage & Consumption Metric to be used to measure the software. Usually if the project have the high risk

$$U = (PT / (PT + ST)) \times 100\,\% \qquad (1)$$

Urgency counted from project time (PT) and spare time (ST). Maximum value of urgency (U) is 100%.

2) Importance

KPI, Non-Functional Requirements, and same on urgency aspect, Software Usage & Consumption Metric should be considered to measure the importance of the process [11]. The quality also take a main part for the IT Initiative on importance aspect [12]. The important the process, the more significant or value it has. If the other process cannot be done or will be interrupted without this process, it means the process are important. Or if the process have the big impact, it can be considered as importance.

TABLE II.   ITBLUTRIC - IMPORTANCE

Importance	Explanation
Less Important	It can be done / have latter
Important	Should be done / have
Very Important	Should be done / have, has big impact, the other process will depends with this process, other process will interrupted if the process not be done

3) Cost

There are many metrics to count the cost: Complexity, Contracts, Cost Center, Cost Drivers, Cost per Function Point, and many more [11]. There is no specific metric method to define the cost metric on ITBluTric because the cost defined by the ability and capability to provide the money and it makes ITBluTric quite unique among the other.

If money can be provided and ready less than 1 day or the decision to spend the money can be decided directly, it categorized with "$" notation. "$$" can be use on ITBluTric if the money are ready less than 1 week or does not require protracted thinking and prolonged corporate meetings. Last, "$$$" notation is required to be used if the money takes a long time to be provided or it need quite tough decision and calculation to be agree to provide the money.

4) Timeframe

Complexity, Function Point, availability can be determined to measure the timeframe [11]. Timeframe usually divided in 3 results: short, medium, long period.

TABLE III.   ITBLUTRIC - TIMEFRAME

Timeframe	Explanation
Less than 1 week	Short timeframe. The process should be done less than 1 week
1 week – 1 month	Medium timeframe. The process can be done up to 1 month after the project started
More than 1 month	Long timeframe. Process needs more than 1 month to be finished. Sometimes, big and complex project needs more than 1 year to complete the whole thing.

III.   IT BLUEPRINT AND INTERACTIVE PRESENTATION

Everybody want to make a successful project, but 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. Why project

failures are keep happening? Because operate without a full and clear Blueprint [13]. The implementation of IT Blueprint when creating the interactive presentation project is a must to make a successful project.

From all the IT Blueprint Framework process, input called Information Flow (The Business) and Progress Report (The Technology) as the output. it is necessary to analyze the company or school's business processes to get the information flow and it will used to support the application and the infrastructure pillar. Transition matrix is to see all the changes that occur with the implementation of IT Blueprint in a specific period of time, we need Transition Matrix. In this study, has been compared by researcher [5], [9], [14], 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 [3].

Below is the comparison figure that will give a clearer picture for what we don't have right now and what will we have in the future.

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

Fig. 1.   Transition Matrix

As the result, transition matrix is created to let we know on which way the transform will flow. Transition matrix is like a bird eye view for the whole planning to create the interactive presentation.

IV.   IMPLEMENTATION

Vision is required to set our target. Vision is the key to deciding the "where are we going to be" [9]. The vision is to create an "interactive presentation".

Current IT situation should be defined by listing the current conditions (each class room has 1 computer (LCD monitor, HDMI port, keyboard, mouse) and 1 projector). SWOT, SWOT matrix (IFAS, EFAS), and CFS can be used as a tools to help defining current conditions [15]. If the current situations have been defined, the future can be clearly projected.
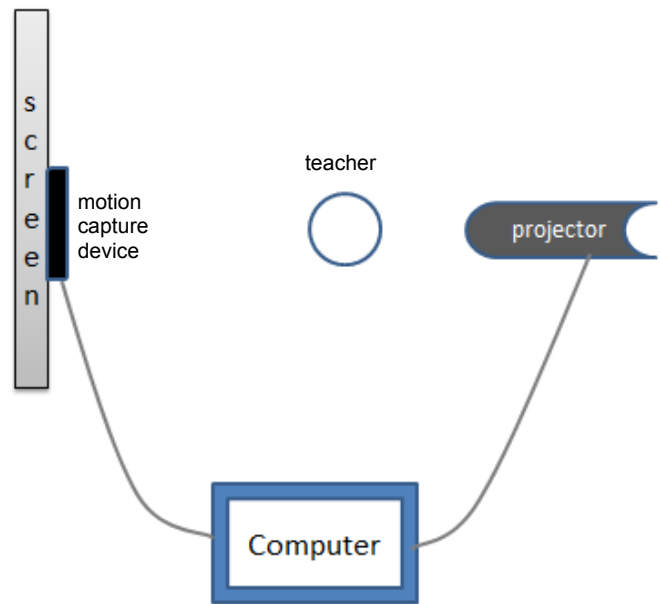
Interactive presentation environment blueprint – view from the top

To detect the hand motion gesture: Microsoft Kinect device and SDK are needed to make interactive presentation software that can help teacher navigating the slides. The computer need the minimum specification: Dual Core 2.55GHz Processor, Dedicated USB 2.0, and 2GB RAM, Windows 7 (32 or 64 bit), .NET 4.0 Framework,   Kinect SDK, and Microsoft DirectX SDK to use the interactive presentation.

TABLE IV.   COMPARISON

Before	After
Presentation slides	Interactive presentation
Navigate using tools: mouse / keyboard / presentation remote	Navigate using hand motion gesture
Can not move freely (because need to use the tools(s))	Can move freely

TABLE V.   NEEDS AND TARGET - APPLICATION

Application	
Needs / Target	Solution
Interactive presentation software	Interactive presentation software that can detect hand movement gesture
Software Development Kit (SDK)	Computer with motion capture device SDK
Compatible driver softwares	Computer with compatible and correct drivers

Infrastructure	
Needs / Target	**Solution**
Device for detect hand motion gesture	Motion capture device that compatible with computer
Platform environment	Computer with required specification of motion capture device
Connectvity	Connect computer with motion capture device

Operation	
Needs / Target	**Solution**
Interactive presentation software can be use	Install and test the interactive presentation software
Guidance to use the software	Create user manual
Knowledge to use the software	Held a software training

Governance	
Needs / Target	**Solution**
Policy	Disclaimer

Security	
Needs / Target	**Solution**
Minimize computer threat	Real-time computer protection

After the business process have been defined, information flow diagram should be created and it represent the flow of information for future application [15]. The features of information flow are enhanced but the hand movement gestures are simpler than the previous research. Tthe navigations in interactive presentation represent by the following actions: "shove right : call previous_slideshow()", "shove right : call next_slideshow()", "open and the close palm : call choose_action()". To help define the tasks to calculate the usability metric, Hierarchical Task Analysis (HTA) which can decompose tasks to subtask / subgoal is needed[16].

0.   Navigate Interactive Presentation Slide
1.   Open the Interactive Presentation software
2.   Check the devices
    1.1.   Check the output on projector
    1.2.   Check the indicator on device
2.   Stand approximately 1 meter towards device
3.   Navigate and operate slides
    3.1.   Choose presentation slides
    3.2.   Navigate the slide
        3.2.1.   Shove left
        3.2.2.   Shove right
    3.3. Choose
        3.3.1.   Open palm
        3.3.2.   Close palm
4.   Exit the Interactive Presentation

IT Initiative will help the way to achieve targets. IT Initiative with ITBluTric is a roadmap of the process should be done (what should be implemented for meet the future IT condition) [15].

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

	^	!	$	~
Motion capture device	^^^	!!!	$$	~
Complete the computer specifications	^^	!!	$$$	~~
Connect computer with motion capture device	^	!!	$	~

	^	!	$	~
Installation	^^^	!!	$	~
User Manual	^	!	$	~
Software training	^^^	!!	$	~

	^	!	$	~
Disclaimer	^	!	$	~

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

The list from Needs and Targets tables counted using ITBluTric measurement. To determine the order of the process in IT Initiative, urgency and timeframe aspects hold a major roles. Usually if the urgency has the higher value, the process should be executed first. Next, if the timeframe of the process is

quite long, it should be come next. Importance and cost aspects could take the timeframe aspect if the importance value is high and if the budget of the process is available. But sometimes the process will be ordered based on the sequence of the process. In Application IT Initiative, Interactive presentation software can not be created if the Driver and SDK not available. In Operation IT Initiative, Installation and Software training have the same level of the aspects (^^^, !!, $, and ~). Because Software training can not be held if the software have not been installed and the User manual been created, Software training should be put on the last.

V. CONCLUSIONS

Teaching method became dynamic while implementing the interactive presentation because teacher can use their hand movement to navigate the presentation using hand motion gesture and not dependable on the computer tools (mouse / keyboard / presentation remote).

IT Initiative in IT Blueprint framework is needed to reduce the failure of the IT project and can help to develop a successful interactive presentation software. Because determining the IT Initiative is quite challenging, ITBluTric as a new metric in IT Blueprint can help to determine the order of the processes using urgency, importance, cost, and timeframe aspects.

IT Initiative have some limitation because it only can be applied on specific organization. If the policy on Cost aspect in IT Initiative is differ among the organization, the order of the process on IT Initiative will also different.

Defining guidance / rules / templates for IT Initiative have a great opportunities for the future research. Since IT Initiative needs to be created from the beginning for each IT project, it will nice if the IT Initiative already have a guidance / rules / templates to be followed to help people reducing their working time while creating the IT Initiative.

REFERENCES

[1] D. Mandic, "Knowledge based multimedia system for teacher's education," Proceedings of the 9th WSEAS international conference on Artificial intelligence, knowledge engineering and data bases, World Scientific and Engineering Academy and Society (WSEAS), pp. 221-225, 2010.

[2] S. Fahmy, A.R. Hamdan, and A. Deraman, "IT in education organization: a strategic planning approach," Informing Science, pp. 441-449, 2002.

[3] M.S. Astriani, S. Pradono, and J.V. Moniaga, "IT Initiative for creative interactive teaching presentation based on IT Blueprint framework," Advances in Educational Technologies, p. 170, 2014.

[4] J.H. Hui-Mei, "The potential of Kinect as interactive educational techonology," 2nd International Conference on Education and Management Technology, 2011.

[5] M.S. Astriani and S. Pradono, "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, World Scientific and Engineering Academy and Society (WSEAS), pp. 160-167, 2011.

[6] S. Bennett, K. Maton, L. Kervin, "The 'digital natives' debate: a critical review of the evidence," British Journal of Educational Technology 39, no. 5, pp. 775–786, 2008.

[7] S. Campanella, et al., "E-Learning platforms in the Italian universities: the technological solutions at the university of Bari," WSEAS Transactions on Advances in Engineering Education, vol.5, no.1, pp. 12-19, 2008.

[8] E.P. Paladini and F.G. De Carvalho, "Dynamic and communicative teaching methods with Artificial Inteligence techiques support," WSEAS International Conference. Proceedings. Mathematics and Computers in Science and Engineering, J. L. Mauri, et al., no. 5, 2008.

[9] M.S. Astriani, "IT Blueprint – jembatan bisnis dan teknologi," Bina Nusantara Information Communication and Technology Conference, 2011.

[10] A. Cassidy, "A practical guide to Information Systems strategic planning," 2nd ed. Auerbach Publications, 2006.

[11] C. Jones, "Evaluating software metrics and software measurement practices," 2014.

[12] A. Abran, R. Al-Qutaish, J. Desharnais, and N. Habra. "ISO-based models to measure software product quality." Institute of Chartered Financial Analysts of India (ICFAI)-ICFAI Books, 2007.

[13] R.K. Palitha, M. Purnendu, and S. Ross, IT project implementation strategies for effective changes: a critical review," Logistics Information Management, vol 15, pp. 126-137, 2002.

[14] 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, pp. 15-19, 2013.

[15] M.S. Astriani, S. Pradono, and H. Saragih, "IT Blueprint for education institution," Advances in Computing, Control and Telecommunication Technologies (ACT), 2010 Second International Conference, pp. 180-184, 2010.

[16] D. Diaper and N Stanton, "The handbook of Task Analysis for Human-Computer Interaction," Lawrence Erlbaum Associates. Mahwah, New Jersey, 2004.