



Development IT Adoption Method for E-learning in Merged University

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ABSTRACT

This research presents an overview to develop an IT adoption method for e-learning in a Merged University. The development of IT adoption method in the Merged University is done by adjusting the gap between three elements: IT maturity level (in this case IT for e-learning), category adopter of each Merged University and IT adoption criteria of individual actors of adoption. The maturity level of IT maturity level refers to Gartner, Hype Cycle, and Priority Matrix. Classification groups refer to adopter categories according to Rogers. The adoption model uses UTAUT model. For the process, a priority calculation method utilizes Analytical Hierarchy Process (AHP). IT adoption method for e-learning in a Merged University has been tested and can be applied Telkom University, formed from four universities.

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1. Introduction

Today, the merger strategy is one of the solutions for University towards the realization of the World Class University (WCU), where the number of universities in Indonesia has reached [1]. The merger strategy is relatively more effective than internal development or the establishment of new University from the beginning [2]. Many things that must be a concern when the university going to the merger process, one of them during the process of IT adoption for e-learning. Merged University should be more selective in choosing IT for e-learning to be adopted, where e-learning technology has been widely applied by Universities in Indonesia. One form of selection that needs to be done is to know and assess the extent to which an IT reach maturity [3]. Aside from the level of IT maturity, Merged University also must notice the impact of differences in the application of IT are adopted by each Merged University, that is has been the establishment of character and the criteria for the adoption of IT in the individuals in each Merged University. This needs to be considered because it can cause problems when IT decision process to choose the most appropriate for adoption at the Merged University, if wrong in the selection of IT for adoption, there will be inefficiency of resources and decreased personal productivity that will not give the desired results for the Merged University [4].

2. Literature Review

2.1. IT Maturity Level

IT maturity level is used to see how changes in information technology from time to time. Gartner divides the level of maturity in information technology into seven levels, namely embryonic, emerging, adolescent, early mainstream, mainstream mature, legacy and obsolete [5]. For able to see levels maturity of IT, estimate how long it took to reach maturity, and help the organization decide when to adopt the IT [6], it can be used Hype Cycle diagram released by Gartner consultants as shown in Figure 1 [7].

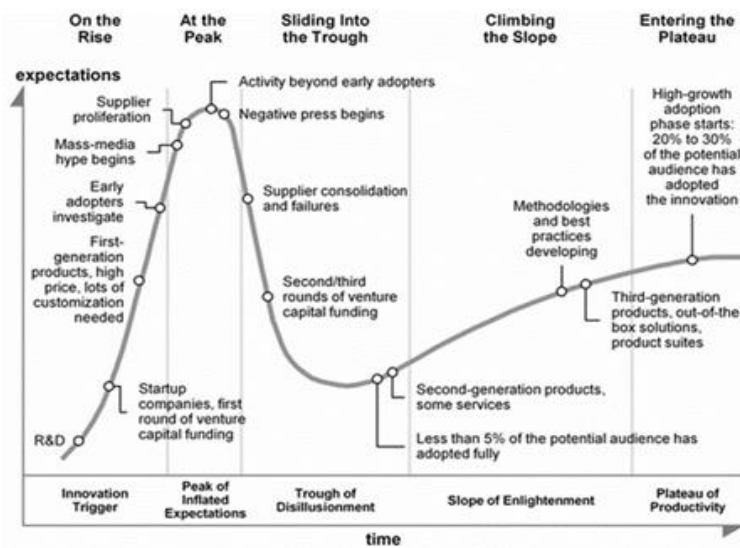


Figure 1 Matrix Hype Cycle along The Cycle and Phase [7]

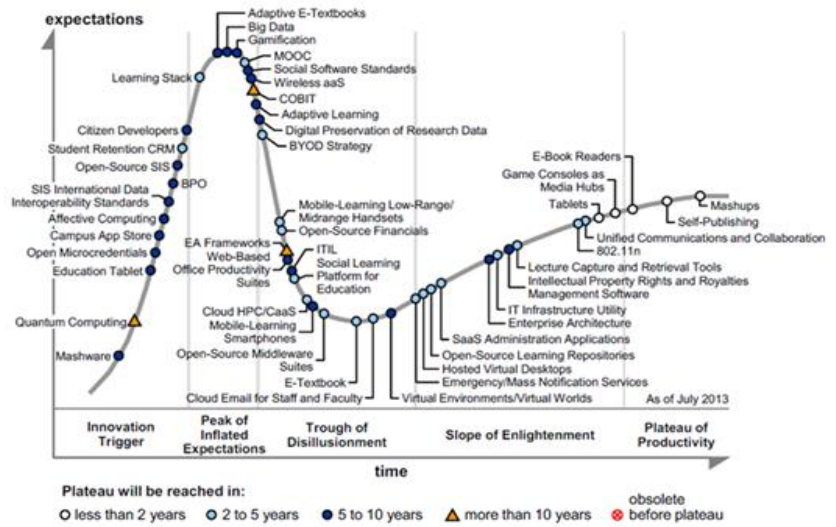


Figure 2 Matrix Hype Cycle 2013 for E-learning [8]

Besides Hype Cycle in Figure 2, Gartner also issued a Priority Matrix as shown in Figure 3 to prioritize IT for e-learning that is developing and appraise the IT opportunities in terms of relative impact on University [8].

benefit	years to mainstream adoption			
	less than 2 years	2 to 5 years	5 to 10 years	more than 10 years
transformational	Tablets	Cloud HPC/CaaS MOOC	Adaptive Learning Big Data Citizen Developers Enterprise Architecture	Quantum Computing
high	Self-Publishing	Cloud Email for Staff and Faculty Emergency/Mass Notification Services Hosted Virtual Desktops IT Infrastructure Utility Learning Stack Open-Source Learning Repositories Open-Source Middleware Suites Social Learning Platform for Education Unified Communications and Collaboration	Adaptive E-Textbooks Digital Preservation of Research Data Intellectual Property Rights and Royalties Management Software Mashware Open Microcredentials SIS International Data Interoperability Standards	
moderate	E-Book Readers Game Consoles as Media Hubs Mashups	802.11n BYOD Strategy E-Textbook Lecture Capture and Retrieval Tools Mobile-Learning Low-Range/Midrange Handsets Open-Source Financials SaaS Administration Applications Student Retention CRM	Affective Computing BPO Campus App Store Education Tablet Gamification ITIL Mobile-Learning Smartphones Social Software Standards Virtual Environments/Virtual Worlds Web-Based Office Productivity Suites Wireless aaS	COBIT
low			Open-Source SIS	EA Frameworks

Figure 3 Priority Matrix [8]

2.2. Adoption Concept

Adoption is a decision to implement an innovative and for sustainability [9]. Another definition said that the adoption process is a process that involves decision-making are influenced by many factors [10].

2.3. Adoption Shape Curve Classification Method

Adopter curve shape classification method pioneered by Rogers [11]. This method is based on the innovation to see the speed groups in adopting innovation within a certain period as shown in Figure 4.

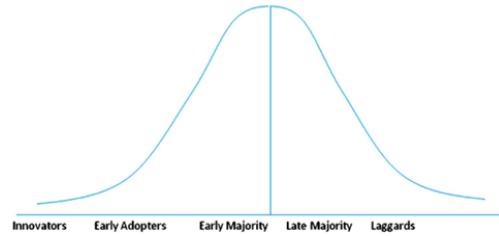


Figure 4 Adopter Shape Curve Classification Method [11]

Related between the adopter categories and levels technological maturity can be seen in Figure 5 [12].

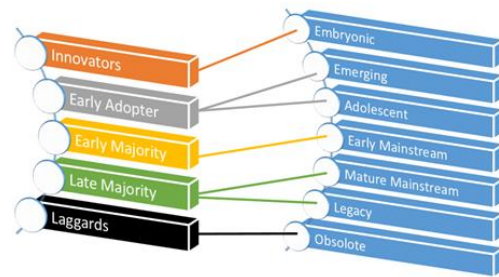


Figure 5 Adopter Category and Technology Maturity Level.

2.4. UTAUT Adoption Model

Unified Theory of Acceptance and Use of Technology (UTAUT) was one of current IT adoption model developed by Venkatesh, and colleagues [13]. UTAUT incorporates features of the eight theory are the successful adoption of leading technology into one theory. In this research, UTAUT model is used as criteria and sub criteria in process of adopting.

2.5. AHP Method

AHP is one method to help arrange a priority of the various options by using several criteria (multi-criteria) with its main input is human perception.

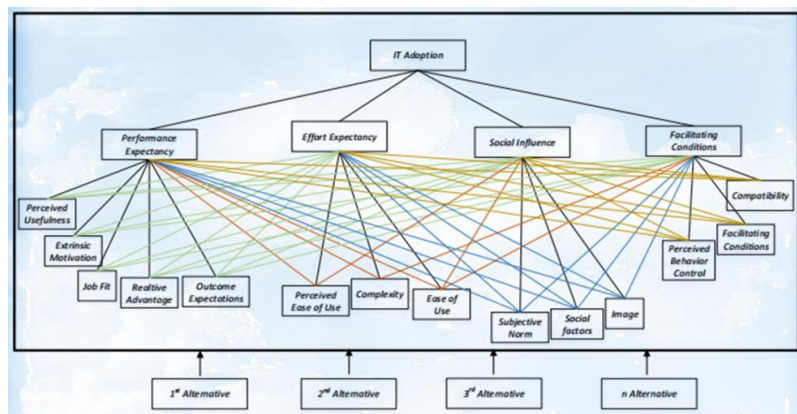


Figure 6 Criteria of Hierarchy and Sub-Criteria in The Process of IT Adoption

The hierarchy of complex problems or unstructured split into sub-problems and then organized into a hierarchy is shown in Figure 6 [14].

3. Analysis and Development

3.1. Analysis of IT maturity level

University did not escape of the utilization of IT development to support existing business processes. In the procurement and use of IT, University must not only assess the trend of the market alone, but must consider the extent to which technology can mature or stable, resulting in the provision of funds, time, and energy is not wasted. To be able to describe the level of IT maturity can use Hype Cycle diagram with the X-axis represents the maturity level of IT and the Y-axis describes the visibility. For view the IT opportunities in terms of impact for University it can use Priority Matrix 4x4.

3.2. Development of IT Adoption Model in Merged University

This research aims to develop an IT adoption method for e-learning in Merged University.

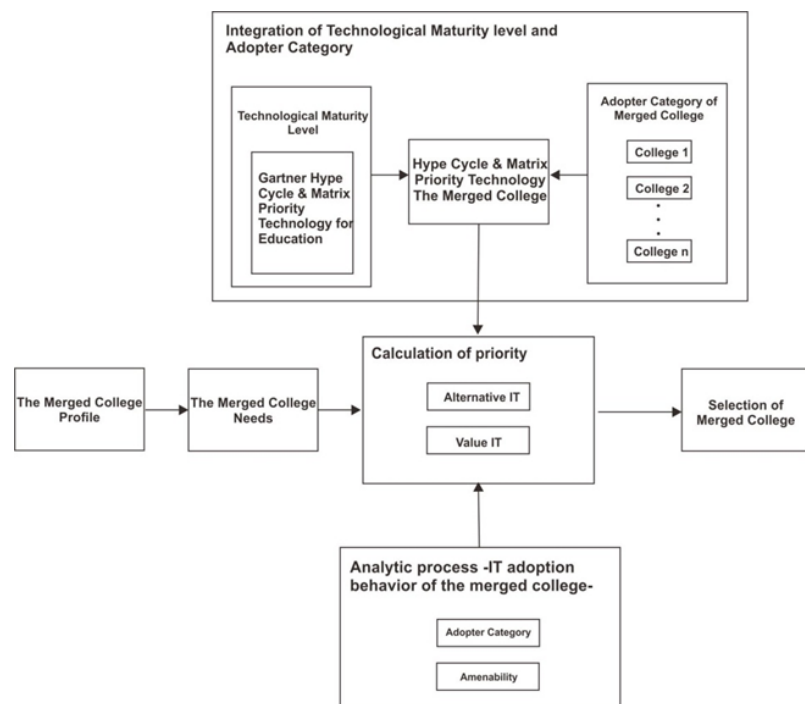


Figure 7 Proposed IT Adoption Method for E-Learning in Merged University

The development of IT adoption method is conducted by adjusting the gap between the level of IT maturity, adopter categories and criteria for the adoption. Proposed IT adoption method for e-learning in the Merged University can be seen in Figure 7.

4. Evaluation of Research Result

4.1. Telkom University Profile

Telkom University is a merged University of IT Telkom, IM Telkom, Polytechnic Telkom and STISI Telkom.

4.2. Evaluation Method

The evaluation method is developed refers to models with observational field studies based on questionnaires and interviews. Validity and reliability of the questionnaires were obtained by Cronbach’s Alpha analysis to a sample of 15 people. The result of data processing obtained with Microsoft Excel version 2017.

4.3. Population and Sample

The total population is this research are all lecturers, students, and academic support staff. Samples in this study were 103 people that are representative of the faculty, lecturers, students and academic staff respectively with using simple random sampling technique [15].

4.4. Integration of Maturity Level & Adopter Category

Based on the analysis result that category adopter of IT Telkom, IM Telkom, Polytechnic Telkom and STISI Telkom as Merged University dominated by two categories, namely the Technology Enthusiasts / Innovators and Early Majority group of pragmatists. Therefore, the alternative IT that should be chosen is IT that has the maturity level at the embryonic level and early mainstream level in the hype cycle and are in the category of transformational and moderate based on the priority matrix. The IT for e-learning that belongs to the conditions mentioned previously are tablets, game consoles as media hubs and mashups technology.

4.5. Analytic Process of IT Adoption Criteria

For IT adoption criteria of Telkom University community, the criteria that the top priority is the achievement of IT support to learn with the weight of 41.47%, ranking second is the criteria of ease of use with a weight of 29.59%, ranking third is the criteria obstacles or barriers that would appear with a weight of 13.04%, and the final ranking is the social influence with weight 15.91% as shown in Figure 8.

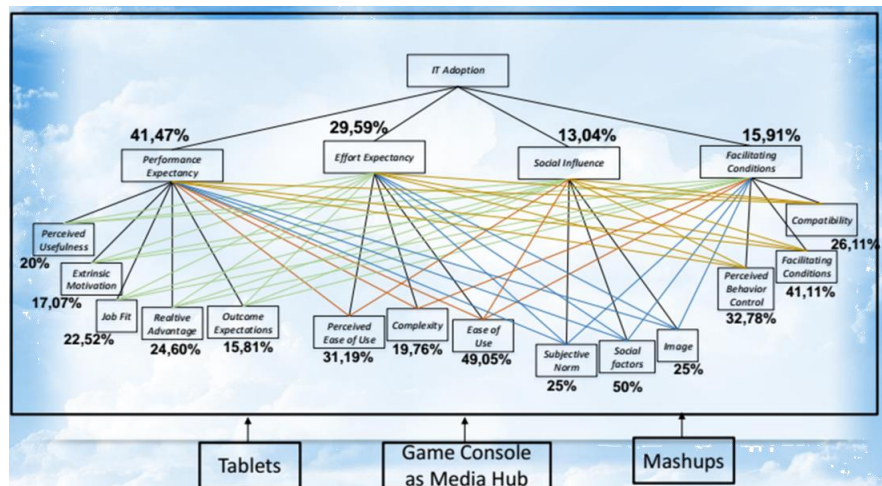


Figure 8 IT Hierarchy adoption Telkom University

4.6. Calculation of Priority

Prior to the calculation of IT priorities, performed first alternative IT evaluation process conducted by interviewing the IT Manager of Telkom University. The evaluation results can be seen in Table 1.

Table 1 IT Evaluation Result

Sub Criteria	Tablets	Game Consoles	Mashup
Support on improvement of work performance	√		√
Support on work motivation	√		√
A match with work	√		√
Support on improvement of the workings			
Expectations of positive results	√	√	
Effort to learn how to use			√
Complexity to understood and used			√
Ease when using the technology	√		
Pressure from most people	√		√
Factors culture / habits	√	√	√

IT priority calculation results in Telkom University found that the tablets be the first priority with a value of 74.72%, then mashups occupied the second priority with a value of 56.10%, and the last is a game console as a media hub with a value of 16.33%. Final scoring is done to determine the priority of the three alternative IT pre-selected (based on the maturity level of IT and adopter categories). The higher score is the more in accordance with the criteria and sub-criteria of individual actors of adoption of IT at the Telkom University.

5. Conclusion

The development of IT adoption method for e-learning in the Merged University is done by aligning the gap between IT maturity levels, each adopter category Merged University and IT adoption criteria of individual actors of adoption. IT adoption method for e-learning in the Merged University has been tested and can be applied to an object of research, namely Telkom University. This research has successfully developed IT adoption method for e-learning in Merged University to optimize IT adoption decision process is based on the maturity level of IT, adopter categories and criteria for IT adoption.

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