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- eLearning case study

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Pretesting a survey instrument of adoption elements in network environment on cloud services - eLearning case study

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Abstract—The success factor elements adoption in a network environment on cloud services by Institution of Higher Institution (IHI) is essential to be defined appropriately. Most of the IHI know the advantage in using network environment on cloud services but they still fears to utilize it because of lack of awareness, guideline and experience. In this study, the success factor elements in using eLearning at network environment on cloud services are defined and retrieve from the literature. The elements defined from the literature were validated by the expert at the preliminary studies. The expert came from the institutions that have experience in used cloud services for an identified the accuracy of the elements. The clear elements define are purposed and stated as important elements. The designing of the questionnaire survey are made base on the elements defined. The output were getting onward will be used as elements of designing in proposed a guideline for Higher Learning Institution in selected the correct eLearning network environment by using cloud services. This paper went thru the step at the designing questionnaire survey. The content and construct validity were done by the reviewer expert in the different fields. The experts were checking the validity of the questions. The questionnaire survey was revise base on the comments of the experts. The understanding and reliability of questionnaire were getting as a final stage before distributed to the pilot study. This paper will depict an impact of the questionnaire survey development in getting the comprehensive and understanding the question onward get the smooth process at the pilot test for get the actual result.

Keywords: cloud, questionnaire, content, validity, construct, network environment

I. INTRODUCTION

One of the main agenda of the ministry of higher education is to ensure at early 2015 all the Institution of higher Learning at Malaysia used the eLearning [1]. The increasing of the users and huge of the teaching material,

Institution of higher Learning need a suitable technology and infrastructure to implement the successful network environment [2]. Preparing and managing eLearning network infrastructure is a complex process requires started on how to manage and planning the suitable network infrastructure [3].

The IHI also seriously willing put an effort to increase the awareness for eLearning implementation by provide the appropriate network technology and infrastructure to implement the best quality of teaching and learning activities [4]. They are also committed to implement the eLearning because they believe it is effective alternative approach compare to the traditional classroom method for distributing information. The current financial crisis append complication to IHI to provide the higher quality of learning network environment[5].

The IHI need to find the other alternative for network environment to make efficient learning by reduce the cost of operation[6]. Moving to network environment on cloud services is one of the solution to reduce the cost of maintenance where all the network component are maintain and overseen by the cloud provider. The cloud environment are new in Malaysia and lack of research in the cloud environment were done [7]. The success factor elements adoption are defined to get the important elements in implementing the network environment on cloud services. This paper will describe the process of designing a questionnaire survey from the success factor elements adoptions getting for network environment on cloud services for eLearning. This study are arrange orderly the questionnaire survey as a results provided for pilot study.

II. ELEMENTS ADOPTION

The elements adoption in this research aims to be a recommendation and references for IHI in using the network environment on cloud services for eLearning. Before the elements was proposed, the elements arise for the literatures were taken as important elements in the network environment on Cloud Services. Then the elements was reviewed by the IT expert for provides the groundwork study that covers in

particular statements regarding the initial situation, opinion and problems. The groundwork study was to determine the validation of elements that reach out for propose there research elements.

The important elements of the research are addressed through the research elements are categorized into four categories which is perception, policy, operation and execution. From the preliminary, the sub element related inside the main elements is adopted. The sub elements addresses under the perception are awareness and benefit. Whereas the sub elements under policy are business needs and cost saving. The procedure sub elements are security and implementation is vendor selection. Figure 1 shown the elements adoption of network environment on Cloud Services for eLearning.

Elements adoption of network environment on Cloud Services			
Perception	Policy	Procedure	Implementation
Awareness	Business Needs	Security	Vendor Selection
Benefit	Cost Saving		

Figure 1: Elements Adoption

Base on the elements adoption identifies the solution to address the success factor elements adoption in network environment on cloud services. Each elements will explain below:

a) Perception

The knowledge about network environment on cloud services is required before the IHI migration to the cloud services. Most of the IHI was afraid to lose the valuable of data and information because the cloud infrastructure is behind the safety firewall. Therefore the knowledge and perception of IT officer are importance for cloud network infrastructure design [8]. Realizing the challenges, the IHI tried to find the effective way how to save the data beside reduce the cost setup and operation[9]. Moreover using the network environment on cloud services can help to improve performance and increase the efficiency [10].

i) Awareness

The clarification about network environment on cloud services for the organization is important awareness given before they move to cloud. The top management must give the awareness on using the network environment on cloud services. The understanding about the benefit of the cloud service and how the cloud service help the IHI to be more proactive beside save the cost of operation must reviews. The awareness given from the top management provide the effectiveness way on how to save the data beside reduce the cost and maximize the accessing[11].

ii) Benefit

By using the network environment on cloud services it most economical and helping the IHI to make faster access. By using the network environment of cloud service has convey many benefits to IHI such as scalability, pay per use, availability, usability and integrity[12]. It also can improve performance, the processes and utilize the resources in the organization. Moreover the other benefit is the user will be accessed outside of the campus which faster access.

b) Policy

A policy is the principle guide decisions to achieve rational outcomes for IHI. The policies of the government must in line with network environment selected. Policies are adopted by governance within an organization. The IHI policy stated is important to make smoothing process of management. The categories of the elements in the policy are:

i) Business Needs

Business needs is about identifying and understanding the business goals, strategies direction, business success, challenges and risks. The understanding the overall of cloud business process by the IHI is important before migrate to cloud services. The IHI must decide the investment objective and business needs of their institution. The understanding about the service requirements for each cloud service model also must street up before make the decision. It also must emphasize the requirement for make faster and easy accessing by using network environment on cloud services.

ii) Cost Saving

By using the cloud services there are no cost for hardware setup, maintaining and upgrading. The software upgrading is become a part of the cloud, there is no need to download or install a specific software. However, the internet connection is required. The cost of licensing in different software packages is moved to the cloud service level, so there is no need to upgrade the local system when new service packs or patches are released. In addition, the abilities to transfer from hard-copy to online will be able to reduce the paper usage.

c) Procedure

The procedure in network environment on cloud services is the procedure in the services process. The security is the important success element procedure in the network environment on cloud services:

i) Security

The challenges are to find the suitable of cloud deployment for IHL onward for high security. Moreover, using the cloud services the network can be shared a pool of configurable computer resources likes networks, servers, storage, application and services that can be rapidly provisioned and enable a minimal management effort for services provider[13]. The advantage of cloud services, data can be access from any location, any time, better access to services, decreased expenses, availability, easy to cooperation and easier data recovery(Macedonia, 2014). IHI and service provider must have agreement and control deployed to protect the data, applications and infrastructure in using network environment on cloud services. Moreover, if the client computer crashes, there are almost no data lost because everything is stored into the cloud.

d) Implementation

The implementation is the carrying out of a plan in order to complete course of action. The implementation and execution of network environment on cloud services is based on the vendor selection.

i) Vendor selection

The selection of the vendor or provider for capability to deliver services is the very important factor for Institution of Higher Learning. The Institution of Higher Learning must make sure the vendor or provider capability to deliver the god services. The Institution of Higher Learning must work together with the cloud provider to take the responsibility to make sure all the setup process, maintaining, reporting, management, detection and clarifies the security responsibilities is done properly. The challengers is the Private Institution of Higher Learning cannot depending to cloud provider totally. Privacy have been provided for this purpose, they cannot restrict unwanted access to the data only [15].

III. QUESTIONNAIRE DESIGN

The research data can be obtained in quantitative approaches through questionnaire survey. The questions of survey were design base on the elements getting from the preliminary study. The questionnaires survey which is close ended and likert scale questions. There have a few steps in designing the questionnaire survey.

1) Content Validity

Before the questionnaire is distributed to the pilot study, the content validation of questionnaire question will be conducted. The content validity is to ensure the consistency, liability and coefficients content of the questions[16].The purpose of content validity are to check the linker scale, language, word writing and reliability and understanding of the questions[17]. In this research five experts were selected in the focus group. Focus group was being interviewed with each

of the expert on elements at each of the topic. The focus groups are from the expert knowledgeable and experience panel in the research. The group of expert was check and revises the question to make sure the item and the content was clear and reliable. Apart from that is IT expert that revise the word base on the technical meaning and technical used. Whenever the statistical expert was look at the correlation and combat alpha of the expectation of the output produce base on the questions design. In addition, the eLearning users were also selected for make their opinion about the eLearning in network environment in cloud services.

After all the idea and opinion was taken the content validity ratio (CVR) will be made for produce the appropriate questionnaire for pilot study. The content validity for each item in the questionnaire was determine using content validity ratio (CVR) and was calculate using the formula below:

$$CVR = \frac{N_e - N/2}{N/2}$$

Where CVR = Content validity ratio for item i (the number of items)

N_e = is the number of experts who agreed on the relevance of the item

N = is the total number of panel of expert judges

To calculate the CVR each item must evaluate, the expert must determine either the question is important or not. If the value of CVR less than minimum value then the item must be remove from the list[18]. In this research only 5 experts selected which is the minimum value was $CVR > 0.99$ are selected. When all of the experts say the description is appropriate, the computed CVR is 1. When it is more than half of them, but less than all the CVR goes between zero and .99. Table 2 shown is the ratio value for content validity (CVR) for each item for this research.

Table 2: The example of ratio value for content validity CVR for each items in this research.

Construct	Item	Design	CRV	Remain/Remove
Perception/ awareness	1.0	$(3-2.5)/2.5=0.4$	0.4	Remove
	1.1	$(3-2.5)/2.5=0.4$	0.4	Remove
	1.2	$(5-2.5)/2.5=1$	1	Remain
	1.3	$(5-2.5)/2.5=1$	1	Remain
	1.4	$(5-2.5)/2.5=1$	1	Remain
	1.5	$(5-2.5)/2.5=1$	1	Remain
	1.6	$(4-2.5)/2.5=$	0.6	Remove
	1.7	$(4-2.5)/2.5=$	0.6	Remove

2) Construct Validity

The construct validity was made base on the observations of the IT expert in the content validity. The construct validity is to perceive overall of the validity test. In this research the construct validity was made by remove or remains the item base on the CVR value result at content validity. The statement of items also was rephrasing base on the expert

comment. There also have a few item was placed in another construct of elements.

Table 3 show the partial of construct correction extraction and item instrument success factors base on the value of CVR in this research. There have either the item want to remove, remain, rephrase or located in another construct item.

Table 3: Construct correction and item instrument Success factors elements adoption base on the value of CVR value.

Construct	Item and Explanation	Action
Perception	1.0 Which solutions do you see as the most suitable for IHI according to this possible security Cloud Service for eLearning?	Remove
	1.1 Public Cloud - owned and managed by an unrelated business	Remove
	1.2 Availability of data services by Private Cloud owned and managed Internally Availability of data services	Remain & Rephrase
	1.3 Integrity of services	Remain
	1.4 Confidentiality of data	Remain
	1.5 Loss of service control	Remain
	1.6 Fully outsourced disaster recovery and business continuity	Remove
	1.7 A contingency plan based on internal resources	Remove

*Remove -base on result at Table 2 where CRV<0.09

IV. CONCLUSION

As a conclusion, this paper discusses the process of the questionnaire survey design in this research. The person selected for involved in the design and analyst the questionnaire survey was important to make sure the output is valuable and understanding. The process was made for accurate written format before distributed the questionnaire to the pilot test. After sorting and rearrange the number of the question, the questionnaire was release to pilot test. The pilot test will observation by a few of people from the real study. From the process at the questionnaire design will be able for next process. Hope through this process everyone in the pilot test sampling will understand the questionnaire survey in the same way but can point out the problems answering with the clear item instructions given and understanding for the research issues. Onward the reliability statistical analyses are checking using statistical software. The reliability refers to the results obtained with an instrument and an estimate of reliability to a particular type of consistency but not sufficient condition for validity analysis.

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