



International Conference on Islam in Malay World IV
(Seminar Antarabangsa Islam di Dunia Melayu IV)

**Strategy of Technology Utilization in Supporting the
Implementation of Knowledge Management in
Educational Institution**



19-21 September 2014

Kelana Beach Resort (Baitul Hilal), Port Dickson,
Negeri Sembilan – Malaysia

STRATEGY OF TECHNOLOGY UTILIZATION IN SUPPORTING THE IMPLEMENTATION OF KNOWLEDGE MANAGEMENT IN EDUCATIONAL INSTITUTION



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Abstract: *This article discusses the strategy of technology utilization in supporting the implementation of knowledge management in educational institution. The implementation of Knowledge Management is believed to be one of the important capital to realize the organizational excellence, including educational institution. The discussion method used as a model of analysis in writing this paper is a qualitative analysis through observation and study of literature approach. The results of analysis and discussion show that optimizing the implementation of Knowledge Management needs to gain the support of technology, in which utilization strategy is designed based on the viability, effectiveness, and efficiency through technology management concepts that refer to the primary purpose of education institution, namely improving the quality of human resources.*

Keywords: *Knowledge Management; Technology, Technology Management*

INTRODUCTION

Education plays a larger role to achieve a fundamental change in the way people live and act. Education has a central and strategic role especially regarding to the development of the quality of human. This shows that educational institution as education providers need to have a competitive advantage.

The cycle of value creation in Knowledge Management (KM) as a former of organizational advantages, starting with the process of resolving problems in the implementation of the organization performance. In this process, the organization is not only processing information from the outside in order to solve the faced problems, and adapt to a changing environment, but it actually is to create new knowledge and information from within the organization, in an effort to define the problem and solution in the process, as well as to rebuild the environment (Nonaka and Takeuchi, 1995).

Chong & Yeoh (2005) identified knowledge management as a process to improve the skills and expertise of employees supported by information technology. According to Brink (2003), the condition of an organization's technology contributes to the development of knowledge-sharing activities of employees. Conditions in the context of knowledge sharing technology can be defined as the level of technological capabilities in facilitating knowledge sharing activities. Ramdhani, Jamaluddin, & Aulawi (2012);

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and Ramdhani (2005) stated that the implementation of Knowledge Management in educational institutions need to be supported by the technology utilization.

Knowledge Management is basically linking activities between learning, change and innovation. Technically, KM emerged as technological encouragement that allows people to record in text, writing, and images and so on. KM can also be regarded as a technique to build learning environments, where people within it have been motivated to learn, utilize existing information, and ultimately want to share the knowledge produced (Nugroho and Mochtar, 2006).

The supports of technological facilities in an organization have an important role in encouraging knowledge sharing activities in the organization. The development of today's technology enables the availability of a convenient facility for saving, searching, and knowledge communication. An example of technological facility support in the organization is through providing groupware, on-line database, intranet, and virtual community.

LITERATURE REVIEW

Technology Management

Ali (2007), states that technology is the application of science systematically to exploit the nature surrounding and control the symptoms that can be managed by humans in the process economically productivity. While Noegroho (2010) states that technology is set to help the human activity and reduce the uncertainty caused by the causality covering in achieving goal.

Technology management is a discipline that bridges engineering and science to the field of management aimed at planning, development and applications of technology in order to achieve strategic and operational objectives of an organization (Nazaruddin, 2008).

The scope of technology management can be viewed as a management process. To reduce the risk of complexity and uncertainty, an organization needs technology planning, in both short term and long term. The organization need technology development that makes the organization views utilization opportunity and technology creation, and is able to capture this opportunity better than other organizations. The organization needs to develop a way to observe and utilize technology resources. More broadly, the scope of technology management can be seen in Figure 1.

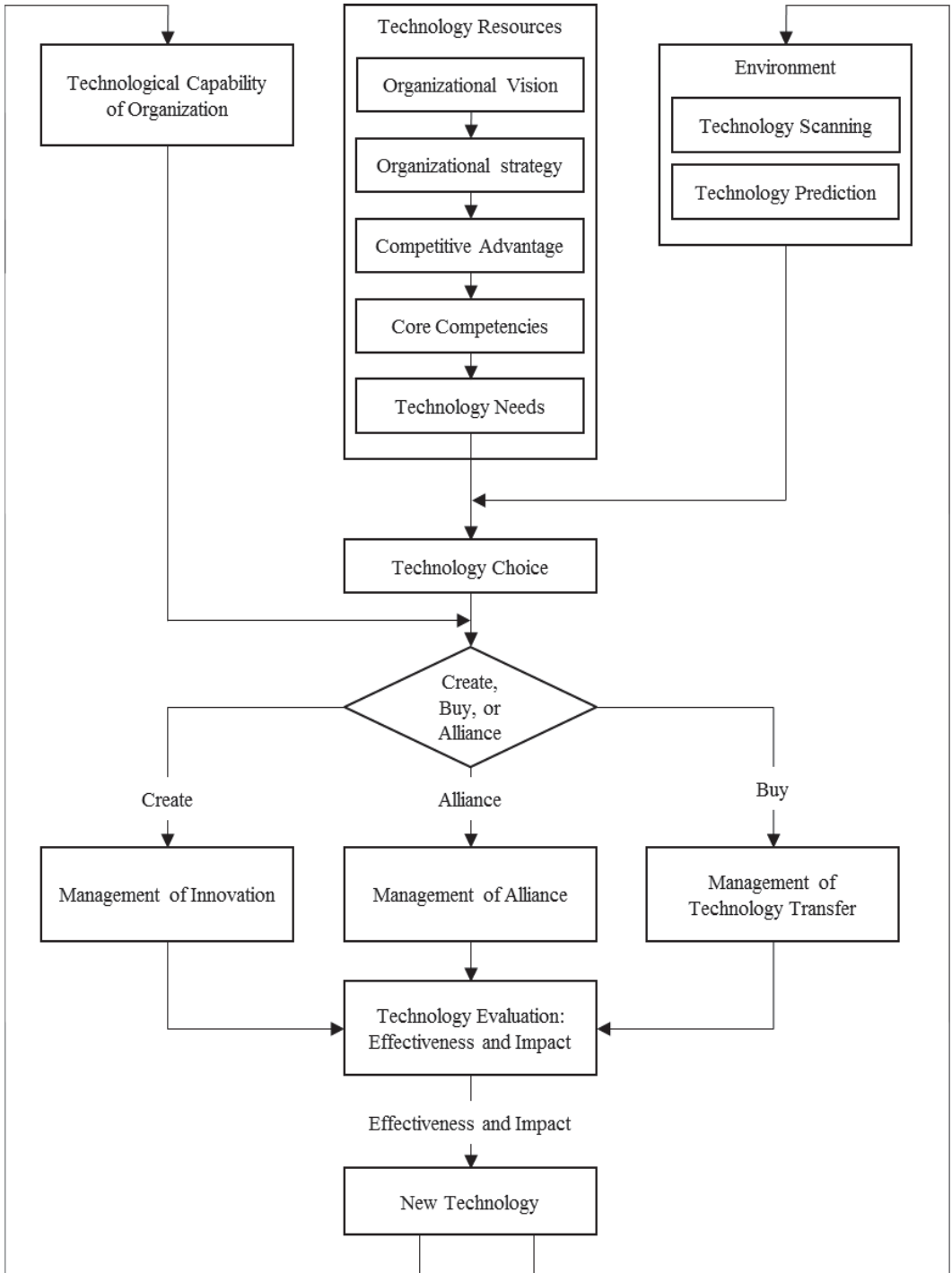


Figure 1: Scope of Technology Management (Nazaruddin, 2008)

Furthermore, Nazaruddin (2008) states that technology can be seen as a human ability that includes:

1. The technology contained in machinery, equipment, and products (object embodied technology)
2. The technology contained in human such as knowledge, attitudes, behaviors and skills (human embodied technology)
3. The technology contained in the organization and management (organizational embodied technology)
4. The technology contained in the documents (documents embodied technology)

Technology Utilization

Information technology is the infrastructure (hardware, software, useware) system and method to acquire, transmit, process, interpret, store, organize, and use data in meaningful ways. Therefore, the use of technology provides much convenience in managing information in the form of saving, reloading, and updating information (Warsita, 2008). Technological support is often a success prerequisite of knowledge management, technology functions to facilitate communication among employees without being limited by distance and time differences, support the flow of knowledge that can be accessed quickly and easily, and to facilitate cooperation among members of the organization.

Technology Function

The fast and cheap development in technology encourages organizations to utilize this technology to improve organizational performance. Organizations can effectively and efficiently acquire and use this technology to support the organizational activities (Wahjono, 2010).

Meanwhile, the functions of information technology in education can be divided into seven functions, namely: (1) as a knowledge repository; (2) as a learning tool; (3) as an educational facility; (4) as a standard of competence; (5) as administrative support; (6) as a tool for school management; and (7) as an educational infrastructure (Warsita, 2008).

The main purpose of technology in education, which is often called as a learning technology/ educational technology is to solve the problems of learning or facilitate learning activities. Learning technology functions as software (software technology) in the form of systematic ways to solve the more sophisticated learning problem and have a wide place in education (Warsita, 2008). Thus, the practical application of learning technology in solving learning problem has a concrete form with the learning resources that facilitate students to learn.

In KM, the main function of technological infrastructure is to facilitate knowledge sharing and to store explicit knowledge that is existing in a digital format to the organization's knowledge repository. Knowledge repository can be accessed via the intranet or internet. Meanwhile, the transferring tacit knowledge is more effectively done through personal interaction, even it is still done through on-line, then the tacit knowledge must first be converted into explicit knowledge in the form of digital data, then can be distributed through new media and networks available (Tobing, 2007).

METHODOLOGY

The discussion in this article uses a qualitative analysis, which connects the observation and the author's experience with the study of literature relevant to the topics discussed in this paper.

Strategy of Technology Utilization

The rapid development of science and information technology pushes educational institutions to produce excellent human resources. The advancement of information and communication technology (ICT) in education opens up new horizons for the opening of opportunity (access) and improving the quality of education at all levels, lines, and type of education (Munir, 2010). Based on the survey results, it is revealed that the use of technology has a positive and significant impact on the implementation of KM (Ainissyifa, 2012).

Educational institution/ school is one of the chains in the national education system, because this organization gives additional value to learners through a scientific transformation process. Education is a principal activity of educational institution/ school, which include activities creating added value for students as the graduates or output of educational institutions/ schools.

Transformation process of added value from input to output in the education system always involves structural and functional components, which play an important role supporting the operational continuity of the education system. Components or structural elements that make up the education system consist of: learners, educators/ education, capital, material, energy, information, managerial, and others. While the functional elements or components consist of: supervision, planning, control, coordination and leadership, all of which are related to the management and organization.

An educational system is always in an environment, so that the environmental aspects such as: the development of technology, social and economic, as well as government policies will greatly affect the existence of the education system. Schematically, the education system can be described as shown in Figure 2.

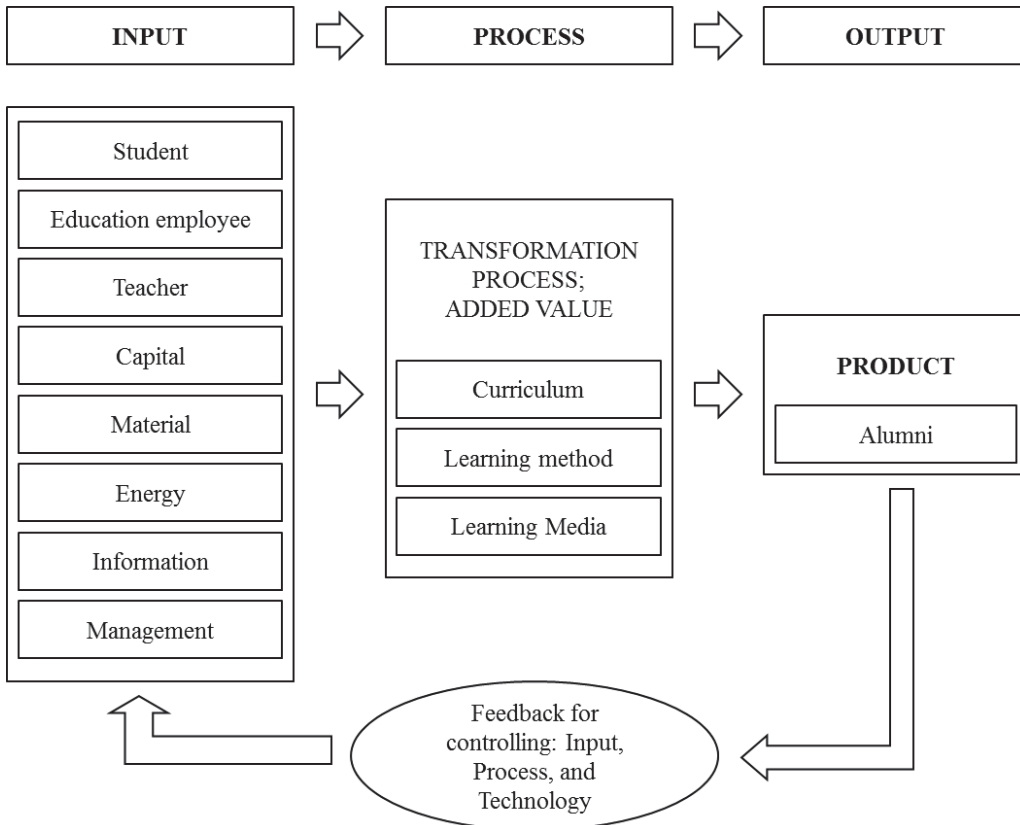


Figure 2: Scheme of Education System

An education system is in an environment that contributed to the existence of the education system. Environment is not a static phenomenon in nature but always dynamic and changing all the time. Organization's ability to anticipate environmental changes and adapt to the new environment is key to the success of the management of educational institutions/ schools. The leaders of educational institutions/ schools should also consider environmental factors in which the education system exists.

There are two main sectors of the environment that are beneficial to consider the education system analysts, namely: economics condition and the state of technology. Economic conditions will affect the cost of inputs and the value added (intangible) output/ graduates produced, so that the analysis of the education system need to consider the factors of economic conditions. The state of technology also greatly affects the behavior of the educational system, where if circumstances change technology will change and improve the effectiveness of the educational process, so that the output quality of the education system will increase.

As it has been described that the ability of educational institutions/ schools to adapt to the environment is the key to success in managing education. One form of the ability to adapt to the environment is adopting a new technology to replace the technology owned. Schematically, the need to adopt the technology is shown in Figure 3.

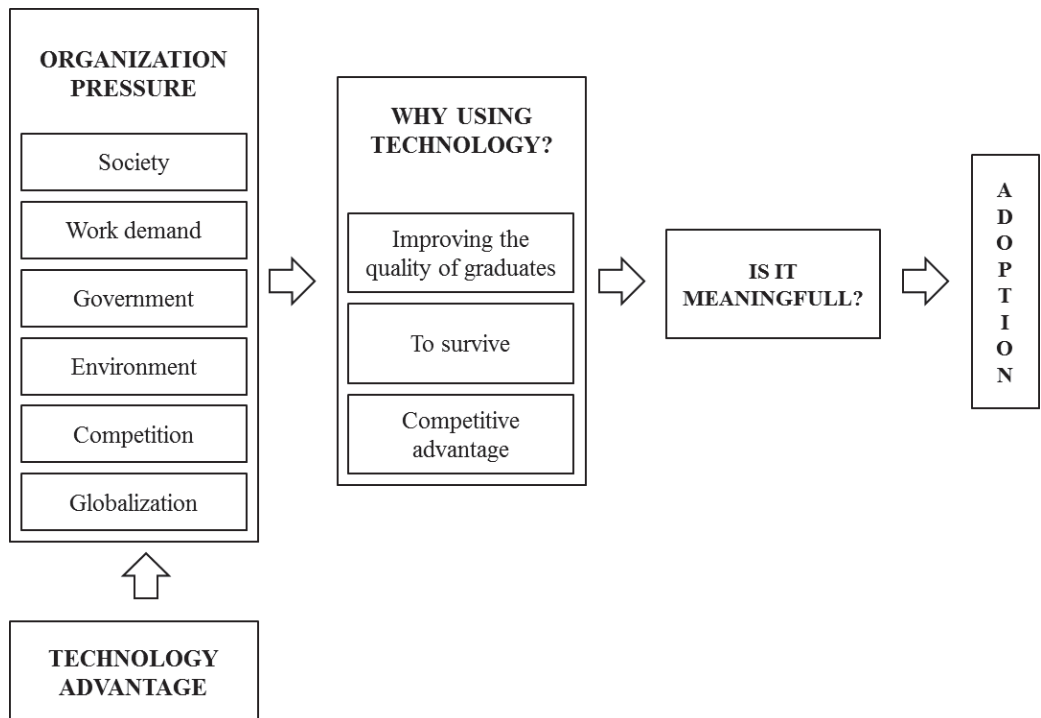


Figure 3: Need to Technology Adoption

The factors which should be reviewed and how the desired appearance are determined subjectively by the user (community/ parent of learners). To be able to generate a model of education with a high level of quality, the educational institution/ school always follow the needs and wishes of the people and the government that are always dynamic, evolving towards improving the graduate of educational institutions.

When educational institutions/ schools want to always satisfy the wishes of people and the government as a way to obtain learners (as a consequence of the wish to survive and the advancement of an educational institution), the educational institution/ school should always perform adjustment on methods, technology processes, organization, supporting facilities, and the others to fulfill the will of people as the users.

Before the educational institutions/ schools try to apply technology, the educational institutions/ schools need to conduct environmental audits (Nazaruddin, 2008) that would explicitly consider both external and internal factors. This audit is necessary to determine the position of educational institutions/ schools today so that they can formulate what they desire in the future. In order to assess these factors there are six basic questions that can be used as guidelines, namely:

1. Why should adopt technology?
2. Whatkind of technology neede?
3. Whether develop or acquisite technology?
4. When is the acquisition of technology done?
5. Where is technology installed?
6. How is technology introduced?

When it seems necessary for technology to be adopted as part of the educational process, then the steps of technology adoption are done, which generally consists of five phases.

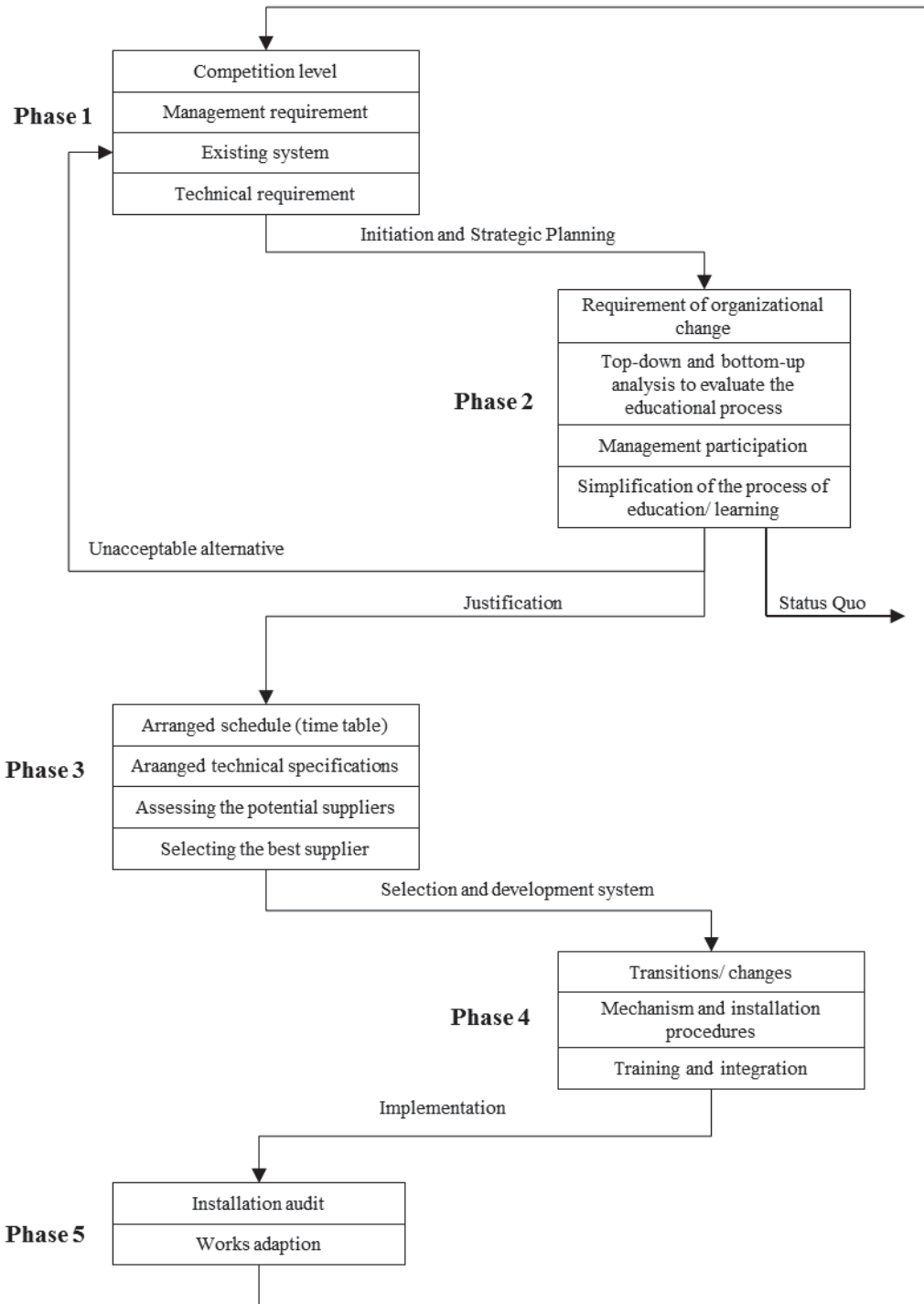


Figure 4: Planning Process, Acquisition, and Application of New Technology

Phase 1 Initiation and Strategic Planning

In this phase the main objective is to identify the areas of education in which technology will be used. At this stage the assessment is done on:

- (a) Formulation of educational priorities.
- (b) Commitment from the management.
- (c) Feasibility study in education

Phase 2 Feasibility and Justification Study

When the field of education in which the technology will be applied is considered to be feasible it is necessary to continue to assess the feasibility of technology. In this case, it needs observe characteristics of available technology in terms of both hardware and software aspects.

Phase 3 Selection and Development

The main objective at this stage is to prepare the contract and determine what should be ordered. For that we need:

- (a) Arranged schedule (time table).
- (b) Araanged technical specifications.
- (c) Assessing the potential suppliers.
- (d) Selecting the best supplier.

Phase 4 Applications

At this stage it is necessary to prepare the working environment and good operating condition so that applications can run smoothly and can avoid the negative impact caused by the use of these technologies. Thus, the objective to be achieved at this stage is for the system to function optimally. It is necessary to do:

- (a) Phase transitions/ changes.
- (b) Mechanism and installation procedures.
- (c) Training and integration.

Phase 5 Post-Application

This stage is the final stage which aims to ensure the continuity of operations and try to prepare for the next cycle of change. So that it needs to do:

- (a) continuous upgrading.
- (b) easy transition.

Furthermore, according to *United Economic and Sosial Commision for Asia and Pasifik* (UNESCAP) in *AltasTechnology Project*, technology can be viewed as a combination of four basic components isintegrated dynamically in a process of transformation. The fourcomponentsare engineered facilities, human capabilities (*abilities*), information (*fact*), and organization (*frame works*) (Nazaruddin, 2008).

In a process of transformation, the four components necessary technology simultaneously. There is no process of transformation that can be done without any of the components. These four basic components of the act as follows:

1. Facility engineering called **technoware**, an object-embodied technology. Engineering facilities include equipment (*tools*), equipment (*equipments*), machinery (*machine*), transportation equipment (*vehicles*), and a physical instructor (*physycal infrastructure*).
2. Ability of human, called **humanware**, a person-embodied technology. This includes the ability of human knowledge, skills, policy (*wisdom*), creativity, and experience.
3. Information called **inforeware**, a document-embodied technology. The information is related to the process, procedure, technique, method, theory, specifications, observation, and relationship.
4. Organization called **orgaware**, an institution-embodied technology. The organization includes management practices, linkages, and organizational arrangements.

The four components of technology are related to each other. The relation among the four components as follows:

1. Technoware is the core of the transformation system. Technoware is built, prepared, and operated by humanware.
2. Humanware is a key element of the transformation operation. Humanware uses infoware in carrying out the transformation operation.
3. Inforeware is also used by humanware in making decisions and in operating technoware.
4. Orgaware directs and controls inforeware, humanware, and technoware in operating transformation operation.

Furthermore, according to Nazaruddin (2008) that the strategy technology utilization follows the six logic simple steps, as follows:

1. Description of the mission and scope of activities at educational institutions/ schools, policy and objective.
2. Analysis of the external environment (technology trends, competitive dynamics, and others) to find opportunities and threats to educational institutions/ schools.
3. Analysis of the resources available to change (human, financial, technological assets, stakeholder's will) to find the strengths and weaknesses of educational institutions/ schools.
4. Formulation and evaluation of possible strategies, which will be based on the fulfillment of the policy of educational institutions/ schools and the selection of the chosen strategy.
5. Determination of required resources to apply the strategy, and how the lost sources can be recovered.
6. If all sources required can't be obtained, or if the risk faced is too high, the policy of educational institutions/ schools is revised and the whole processes are repeated.

The role of technology in developing the strategic interests of the institution/ school:

1. An element of a reactive planning mode.
2. Leading planning process proactively.
3. Becoming a direction of corporate strategy, involving foundation, school, and parents of students.

Another important thing of technology utilization in educational institutions/schools requires the institution to build a system that has the ability to estimate the value, plan, develop and implement technologies that will affect the future of educational institutions/schools. Educational institution/school should also organize the acquisition of technology internally through research and development; and externally through cooperative research and development, licensing, and more.

CONCLUSION

Technology utilization provides strong support for the implementation of knowledge management in educational institution to improve its excellence. The use of technology is changing rapidly; provides opportunities to select the main strategies of educational institutions/schools, but at the same time, it provides a risk for educational institutions/schools. Therefore, management of educational institutions/schools should be able to take responsibility for aligning technology with strategy development related to educational institutions/schools, taking into account aspects of the capability, effectiveness, and efficiency through technology management concepts with reference to the primary purpose of education institutions, namely the improvement of human resources quality.

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