

The knowledge creation process and factors influencing knowledge creation in developing academic products and service systems in Universitas Terbuka (Indonesian Open University)

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Sub-theme: Planning and Management: Institutional Planning, Change Management, and Knowledge Management in Open Education Institutions.

The development of the service system and academic products in the Indonesian Open University (Universitas Terbuka/UT) should be done continuously so that Universitas Terbuka/UT can provide effective and efficient services. The development of academic products aims to provide good quality academic products and learning support for students. UT continually develops the knowledge to produce those products. Theoretically, the process of knowledge creation involves tacit and explicit knowledge. This research aims to explore factors that influence knowledge creation in developing academic products and service systems in Universitas Terbuka (Indonesian Open University). Research was conducted on 5 teams in the UT Head Office and Regional Offices in the area of developing learning materials using the tablet, research information systems, work procedures at the regional office, and systems of academic services and academic administration services via short message service (SMS). Data was obtained using in-depth interviews with the leaders of the teams. Data collected showed that there are several factors contribute to the effectiveness of the development process: high-experienced team members, small teams, high commitment from team members, high technical skills of the team members, intensive communication, non-hierarchical team member positions, availability of infrastructure and funding, the ability to process feedback, the ability of team leaders to make decisions, informal communication, freedom in expressing and creating ideas, serving team leader, and less involvement from top management to interfere in technical issues. Factors that inhibit the development process are the availability of time of team members, lack of time to meet with all team members, low competence of team members, and the lack of human resources.

Keyword : knowledge creation, tacit knowledge, explicit knowledge, developing product

Introduction

Indonesia is a country with an area of more than 1.9 million km² and has 17,000 islands. Indonesia's population is more than 230 million people. Indonesia also has more than 300 ethnicities and languages. This is coupled with the level of income and income between regions that are not evenly distributed. Thus Indonesia is a country with very high complexity.

Conceptually, organizations need high adaptability to survive in an environment with high complexity. One of the adaptability of an organization is demonstrated by its ability to continuously provide products and service systems that meet consumer demands. It is in such a context that the Open University/The Indonesia Open University (UT) operates.

UT is a government-owned university founded in 1984 with a mission to provide educational services to working people, teachers, and high school graduates. In carrying out its mission, UT is not given a complete infrastructure. UT was asked to share resources with existing institutions, especially in providing tutors for writing teaching materials and exam materials, test venues, practice and practicum locations, and tutorial locations. The current number of UT students is 300,000 thousand students spread throughout Indonesia and abroad. Organizationally, UT consists of Central UT and UPBJJ which are spread across 39 regions.

To carry out this mission effectively and efficiently, UT must be able to develop a system that can produce academic products and service systems that can meet the needs of students and stakeholders in a sustainable manner. Therefore, UT's ability to develop academic products and service systems is an important agenda for UT. UT is required to always produce academic products and service systems that are inexpensive, easy to use, or accessible to students who are in urban, rural, mountainous, and coastal areas.

Based on observations, UT is very intense in developing academic products and service systems. The academic products developed are printed, non-printed, and network-based teaching materials. While the service system developed is a service system that uses an information system as its basis. Academic product development activities are carried out at Central UT while service system development activities are developed by Central UT and UPBJJ.

From the results of observations, researchers obtained an overview that product and system development at Central UT was generally carried out by a team formed by the Chancellor or head of UPBJJ. Team members range from 3-8 lecturers with different expertise. For the development of the service system, non-lecturer members are also involved. The product development process and service systems rely on information systems. In this development, the main obstacle encountered was the problem of time availability which made coordination difficult among Team members.

The research was conducted with a qualitative approach. The research was conducted on 5 teams in the UT Head Office and Regional Offices in the area of developing learning materials using the tablet, research information systems, work procedures at regional offices, and systems of academic

services and academic administration services via short message service (SMS). Data collection was carried out using in-depth interviews with the team leaders and observation. Interviews were conducted in April 2013 at UT Center and UPBJJ UT Bogor. The interviews focused on team membership, management involvement, and support, the knowledge creation process including the use of experience in the knowledge creation process, factors that support the knowledge development process, and factors that hinder the knowledge creation process. Data processing is done by grouping how the processes of sharing tacit knowledge, creating concepts, justifying concepts, building archetypes, and cross leveling knowledge are carried out in the development of academic products and service systems at UT. Then an analysis of the factors that influence the knowledge-creation process is carried out.

This research was conducted to explore the steps of knowledge creation and the factors that influence the knowledge creation process in the development of academic products and service systems at UT.

Theoretical foundation

The process of developing knowledge began to receive attention when Chris Argyris and Peter M Senge published their work on learning organization in 1983 and 1990. The definition of LO from Senge (1990) is "... an organization where people continually expand their capacity to create the results they truly desire". .. Since then LO has become an important subject of study in management. In different terms, Nonaka and Takeuchi (1995), introduced the term organizational knowledge creation, namely the capability of the company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems. Nonaka and Takeuchi's explanation clarifies Senge's opinion that individual capacity development is carried out through the process of creating, disseminating, and placing knowledge in products, services, and systems. In the opinion of Garvin and Schermerhorn, LO consists of several main components, namely the creation, distribution, storage, and use of knowledge (Garvin, 2000; and Schermerhorn, et.al. 2011). Thus knowledge creation is part of the learning organization.

Furthermore, Nonaka and Takeuchi (1995) explain that knowledge consists of two dimensions, namely tacit and explicit. Knowledge creation is carried out by carrying out four models of knowledge conversion, namely socialization, externalization, combination, and internalization. Based on these four conversion models, Nonaka and Takeuchi introduced a five-phase model of the organizational knowledge creation process, namely sharing tacit knowledge, creating concepts, justifying concepts, building archetypes, and cross-leveling knowledge.

Rhodes, et.al. (2008) in research on MNCs in Taiwan found that the factors that influence organizational knowledge transfer are IT systems, structured learning strategy, and an innovative organizational culture. Meanwhile, Kasper, et.al. (2008) found that organizational knowledge sharing influenced by the degree of decentralization of knowledge management highly influences the intensity of cross-site knowledge sharing and the importance of communities of practice within the company decreases with the decreasing intensity of knowledge sharing across the site. Chermin and Nijhof (2005) found that the most important factor in the creation of new knowledge is knowledge sharing and reflective learning on the job. To carry out knowledge creation,

organizations need to have the ability to obtain sharing and manage information both within and from outside the organization. Barton (1995) stated that an organization's ability to innovate is influenced by the organization's ability to recognize, obtain, and use information from outside.

To carry out this process, the role of IT is very important. "... for organizations to learn, they must engage in knowledge acquisition, information distribution, information interpretation, and organizational retention in adapting successfully to changing circumstances". (Schermerhorn, et.al . 2011). These systems (IT systems) facilitate the rapid acquisition, processing, and sharing of rich, complex information and enable people to manage knowledge for competitive advantage (Cummings and Worley, 2005). Another influential factor is human resources, "human resources, including appraisal, rewards, and training are designed to account for long-term performance and knowledge development; they reinforce the acquisition and sharing of new skills and knowledge. (Cummings and Worley, 2005).

As part of the LO, the knowledge creation process is influenced by factors namely organizational structure, information systems, human resource development, organizational culture, leadership, and organizational climate. (Cumming and Worley, 2005; Mullins, 2005; Marquardt, 2002; George, 1997; Schermerhorn, 2011; Robbins and Judge, 2011).

Based on the description above, it can be concluded that to be an adaptive organization, an organization needs to have the ability to create, distribute, store, and use knowledge. The process of creating knowledge is carried out through the stages of socialization, externalization, combination, and internalization. The knowledge creation process is influenced by the components of organizational structure, information systems, human resource development, organizational culture, leadership, and organizational climate. The process will take place well if the organizational climate provides support. The environment provides support in the form of support and encouragement to overcome fear and shame associated with making mistakes, norms that legitimize the making of mistakes, and norms that reward innovative thinking and experimentation. (Garvin, 2005).

Findings

The structure of the presentation in this sub-chapter begins with a description of the five-phase model of the organizational knowledge creation process, namely sharing tacit knowledge, creating concepts, justifying concepts, building archetypes, and cross-leveling knowledge at UT. After that, it is presented about the factors that support and hinder the process of knowledge creation at UT.

Sharing tacit knowledge

Tacit knowledge is obtained from experience and has settled in one's memory. Tacit knowledge is generally in the form of experience so it is not easy to explain it back through words. Sharing tacit knowledge is carried out through face-to-face meetings. In this process, initially, a lot of information is shared, so steps are needed to select the information that is suitable for the purpose.

From the results of the interviews, information was obtained that the team members had various experiences, technical expertise, and backgrounds that were appropriate to the project to be worked on. Each team member has experience and knowledge that can be used to create knowledge. To start the dialogue process, the team leader usually gives an initiation or initial draft of the project. In the process of face-to-face dialogue, team members share their experiences and views. This experience is obtained in working at UT, and outside UT, as well as from learning outcomes. Through this process of sharing tacit knowledge, understanding is obtained between team members and an understanding of the details of the project. They also provide input and improvements to the drafts or initiatives that have been submitted. This sharing process is not only done once but many times. The team met several times. Every progress is discussed together, both face to face and via the Internet. To complement the results of the dialogue, the teaching materials development team also uses students to provide input about online teaching materials.

Creating Concept

The creating concept stage is the stage of bringing together tacit knowledge with explicit knowledge. The process of sharing tacit knowledge produces a lot of information. Not all of this information is useful for knowledge creation. The team will select data and information that is relevant to the objectives taken. Based on the results of the interviews, four things were used as the basis for making the selection, namely (1) based on the rational considerations of the team members; (2) based on user or stakeholder input; (3) based on experience; and (4) based on benchmarks with other products made via the internet.

The concept is prepared by the steps of a team member preparing an initial draft or design as initiation material to be discussed and given input and then it is decided to use it. The concept formulation process is carried out in stages from the core team level and then in an expanded dialogue process or carried out simultaneously in team meetings. To confirm that the concept is correct, the team benchmarks again via the internet or discusses with communities in cyberspace. Some asked for reinforcement from their superiors that the draft was correct.

Justifying Concept

Concept justification is the phase where the team agrees on which concept to use. The basis for doing justification is generally the effectiveness and efficiency of the product and conformity with the vision of the organization. Justification can be based on quantitative standards or judgments based on organizational values and norms, as well as mutual agreements.

Based on the results of the interviews, there are two models of justifying concepts at UT, namely the first justifying concept through mutual agreement and the second through the intervention of the leadership. A concept that has been developed needs to be agreed upon when the product or system concept that has been designed is declared complete or meets the requirements.

Justifying concepts carried out through agreement by team members. The standards used to agree on concepts are generally based on technical considerations. In the teaching materials development team and research information systems team, input from users and other parties who are more skilled as well as benchmarks with other similar products are additional considerations. For the concept of products related to services, generally, the leadership's input is an important consideration, because the service system will generally be integrated with existing systems.

Building an Archetype

After the concept is agreed upon the next step is to build a model or prototype. This process is a process of combining explicit knowledge in the form of concepts with existing explicit knowledge such as technology and other infrastructure to make concepts real. In this process, the team must involve parties related to this project.

From the results of the interviews, the building archetype was carried out with a team or core person who developed the initial prototype development design, then provided input, and perfected the prototype design. Completion of the prototype is done by involving the client by the potential product users. Refinements were also made by comparing existing products by browsing the internet.

From the interviewed teams, information was obtained that what was done when designing the prototype was (1) choosing the right gadget; (2) checking infrastructure readiness; (3) preparing the trial procedure design and its use; (4) conducting trials of data entry (in the development of research information systems); (5) cooperate with units that will later use the product.

When designing prototypes, weaknesses are sometimes found in the concept, so the concept also needs to be revised. At the time of the revision, the steps on the justifying concept were repeated.

Cross Leveling Knowledge

When the academic product and service system has been created, the product must be launched. Every development and use of academic products and service systems always involve other departments such as finance, human resource development, quality assurance, lecturers, and leaders and also involves organizations/other parties outside the organization. Other departments need to know because they will use or be involved in the product or system. While outsiders need to know because they are likely to be users of the product.

Cross-Leveling Knowledge is done face to face and using internet media. The scope of UT's work area is wide so the Cross Leveling Knowledge process is often not carried out all at once but in stages and uses a mixed mode of face-to-face and with the media. In multilevel cross-leveling knowledge, the process is carried out on a limited group of people, then these people do it on a wider range of people. To increase its effectiveness, this process is usually combined with media such as websites, e-mail, and telephone. The sms development team provided guidelines which were then sent to regional officers. Meanwhile, in the research application development team,

blasting guidelines are provided to users (lecturers) via email. A forum is also provided to provide feedback on the product. Feedback is used as a material for product improvement.

Factors that support the knowledge creation process at UT

The success of knowledge creation cannot be separated from the organization's support for the team. These factors are (1) team members have adequate technical capabilities. The adequate ability of team members makes it easier to develop concepts and prototypes because they have knowledge and experience about the products being worked on. This facilitates the occurrence of knowledge sharing. The ease of knowledge sharing encourages the creation of new knowledge (Chermin and Nijhof, 2005); (2) Granting authority to the work team. Non-hierarchical team. The work team is given the authority to form their team, determine their work methods, determine partners, and manage work time. Leaders only provide policies, especially goals, budgets, and deadlines. The rest is left to the team to carry out. This is by Kasper's findings (Kasper, et.al., 2008) (3) Leaders provide tolerance if errors occur in the development of products and service systems, so that the team becomes more creative in finding new ways or products. The importance of tolerance is also conveyed by Garvin (Garvin, 2005). According to Garvin, tolerance for mistakes is part of organizational culture. (4) Leaders support by providing the necessary facilities, funds, and human resources. Even if you have to bring in experts from outside UT, the leadership always provides support. This is also by the findings of Barton (1995) that the innovation ability of an organization is also determined by its ability to obtain knowledge from outside. (5) motivating in the form of praise and compensation, this is by the opinion of Cumming and Worley (Cumming and Worley, 2005) that assessment and compensation need attention, and, (6) the availability of reliable IT infrastructure. It functions as the backbone of the knowledge creation process. This is by the opinion expressed by Schermerhorn (2011) and Cummings and Worley (2005).

While the inhibiting factors are (1) the problem of difficulty in coordination. Team members are lecturers or administrative staff who work in other units. They are assigned to a team to carry out a certain project without leaving their main tasks, so the team leader often has difficulty scheduling team activities. (2) the time allocated by team members to work in teams is less, thus reducing product quality or requiring a longer time to finish it. (3) information was obtained from the team at UPBJJ that there were team members who lacked vision, so their contribution to the team was small.

Conclusion

This study attempts to describe the process of creating knowledge at UT by using the concept of a five-phase model of the organizational knowledge creation process, namely sharing tacit knowledge, creating the concept, justifying concepts, building archetypes, and cross-leveling knowledge proposed by Nonaka and Takeuchi. The knowledge creation process seeks to "unload" the accumulated experience of each team member to serve as the basis for developing academic products and service systems through a process of sharing tacit knowledge. Through sharing tacit knowledge, the team develops concepts, agrees on concepts, and turns these concepts into prototypes. During the preparation of this prototype, many factors need to be taken into

consideration, such as the economy and implementability of the products and systems being prepared. These considerations are important because the resulting products and systems will be integrated with existing systems. The final stage is introducing products, procedures, and matters relating to these to stakeholders.

In carrying out this knowledge-creation process, there are supporting factors and inhibiting factors. Supporting factors include (1) adequate team technical ability. (2) The team is given adequate authority. (3) there is tolerance in the event of an error in development; (4) there is support for facilities, funds, and human resources; (5) provision of adequate motivation and compensation and, (6) availability of reliable IT infrastructure. While the inhibiting factors are (1) the existence of difficulties in coordination. (2) lack of time allocated by team members; and (3) there are team members who lack vision, so their contribution to the team is small.

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