IDEA GROUP PUBLISHING

701 E. Chocolate Avenue, Suite 200, Hershey PA 17033, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com

ITP4625

Knowledge Creation Process: Evolving Knowledge Process (EKP) Model

Win Maung
Department of Information Systems
University of Technology, Sydney
PO Box 123 Broadway, NSW 2007, Australia
Email:winmg@it.uts.edu.au

"*Knowledge is experience. Everything else is just information.*" – Albert Einstein

ABSTRACT

Nonaka and Takeuchi (Nonaka, 1995) define knowledge creation as a spiraling process of interaction between explicit and tacit knowledge. However, their theory is to be made concrete to integrate into business process. To do this, the author proposed the Evolving Knowledge Process (EKP) model for a systematic approach for capturing and managing knowledge. The proposed model consists of knowledge resources and knowledge activities for creating and capturing knowledge.

1. INTRODUCTION

The main goal of research on knowledge management is to design processes that an organization can use to learn to improve its ways of working and to create value for its customers and community (Choo, 1999). Such research must address ways to integrate knowledge management into business processes. These activities should not be seen as separate. Nonaka's knowledge creation process is often broad and abstract and needs to be made concrete to integrate into business processes. We propose a systematic approach to knowledge management. This must include a systematic way of finding, selecting, organizing, and presenting information within business processes. This often requires appropriate and effective technology to support the process. In this paper author proposes a concrete process that follows a set of concrete steps. This process is called the Evolving Knowledge Process (EKP) model.

The EKP model has a sequence of knowledge activities that create and capture knowledge in a business context. The model is finally defined all consists of five activities: knowledge accumulation, filtering knowledge, domain knowledge analysis, knowledge consolidation and knowledge modification. Knowledge resources are captured knowledge object, time & space, filtered knowledge object, transitioned knowledge object and consolidated knowledge.

The paper describes a use-case design approach to show business to consumer process as an example how to integrate EKP model into business process.

2. DATA, INFORMATION AND KNOWLEDGE

It is important to differentiate between data, information and knowledge. Data are just facts and have no meaning unless one understands the context in which the data was gathered. Information has been packed with data in a useful and understandable way. Knowledge is the richness of personal learning, insight and experience. Knowledge provides the background that allows one to make the best decision. Knowledge can be in people's heads (tacit knowledge) or it can be written down or recorded (explicit knowledge).

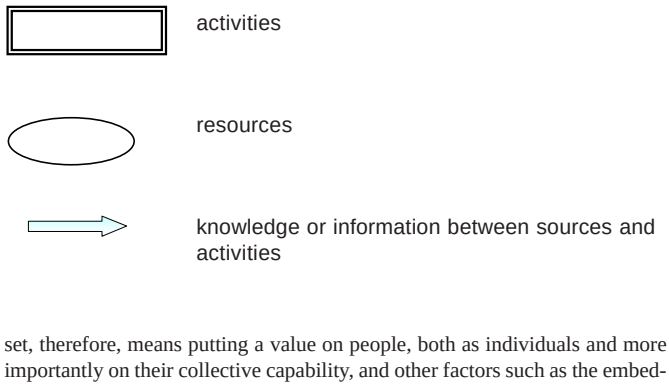
3. EVOLVING KNOWLEDGE PROCESS (EKP) MODEL

The following notations are used to the presents the EKP model, shown in Figure 1. The activities are knowledge accumulation, filtering knowledge, domain knowledge analysis, knowledge consolidation and knowledge modification and resources are captured knowledge, time & space, filtered knowledge object, transitioned knowledge object and consolidated knowledge.

Knowledge Asset: Knowledge asset is some combination of context sensing, personal memory and cognitive processes. Measuring the knowledge asset, therefore, means putting a value on people, both as individuals and more importantly on their collective capability, and other factors such as the embedded intelligence in an organization's computer systems (Skyrme 2002).

Explicit Knowledge: Explicit knowledge is codified knowledge, which is usually documented in the form of publication or stored as electronic formats. The explicit knowledge may be collected from internal or external resources. Internal knowledge resources may be various recorded documents or stored databases of the organization. The common resources of external knowledge include external publications, government agencies, consultants and alliances.

Tacit Knowledge: Tacit knowledge is the form of knowledge possessed by individuals and not usually stored. It can only be obtained through sharing the ideas and concepts and collaboration among the group of people. It is especially useful in using previous experiences to analyze existing information and take actions in current circumstances.



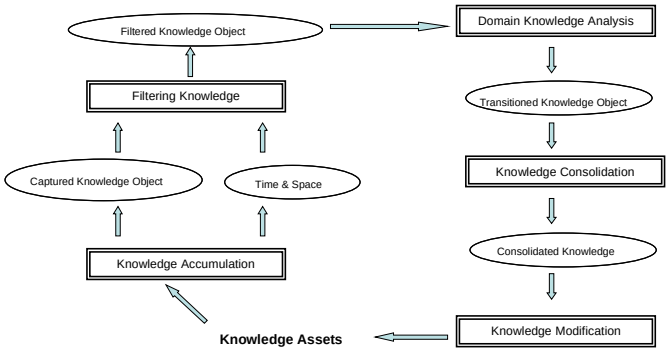


Figure 1. Evolving Knowledge Process (EKP) Model

Knowledge Activities

Knowledge Accumulation: Knowledge accumulation is a process of collection and collation of useful knowledge from various external and internal knowledge assets such as documented processes, structures, strategy, goal setting, direction and resources of the business organization.

Filtering Knowledge: Creating knowledge assets is the task of selecting or filtering information in order to make it relevant to the organization. Figure 2 describes filtering knowledge process. If information is relevant, it is to be retained or memorized in knowledge base. If information is not relevant, it is to be rejected or ignored (Godbout, 1996). Some information may be retained in memory for recall when necessary.

Domain Knowledge Analysis: The process which analyses the given set of tacit and explicit knowledge based on predefined domain rules and norms are called domain knowledge analysis. It first acquires prerequisite knowledge of business domain that is the basic know how of the business and its transformation methods into activities which is the relevant in the specific context of business domain and further uses it to analyze the provided case of application.

Knowledge Consolidation: Knowledge consolidation accumulates transitioned knowledge objects into consolidated form of knowledge.

Knowledge Modification: Knowledge modification is a process of updating or modifying the existing knowledge assets.

Knowledge Resources

Captured Knowledge Object: Knowledge accumulation produces *Captured Knowledge Object* which is a desired level of knowledge use in practice and application.

Time & Space: *Time* is important to situate the business plan in the context of time. *Space* is the location that can be validated in the situation of knowledge.

Filtered Knowledge Object: Filtered knowledge object is the quality of synthesized knowledge and is determined by its accuracy and appropriateness. It can be used to interpret the reality and can provide means for predicting the behavior of resources or person in the business system.

Transitioned Knowledge Object: Transitioned knowledge object is a set of transformed object, which is produced by domain analysis process. It is a new level and/or updated knowledge. This contains sufficient amount of modified and updated form of existing knowledge of business process.

Consolidated Knowledge Object: Consolidated knowledge object is a verified, validated and comprehended transitioned knowledge object for the intended purpose. This knowledge object is embedded into long and short term organizational memory. It can be utilized for analysis of business situation and helping management in taking decisions.

4. DISCUSSION

In this section, the author applies use-case approach to the EKP model in a business process. The paper describes the business to consumer process. In the example, activities and resources of the EKP model are shown the square bracket in italics. A use case diagram shows in Figure 3.

* the system boundary-
  a box that separates the systems from its environment defines the behavior of the system
* each external actor-
  an actor may be person, a computer, or an organization the type of the actor may be shown in guillemets << >> the name of the actor is show with the actor

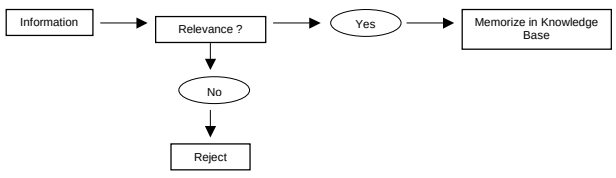


Figure 2. Filtering Knowledge (Godbout, 1996)

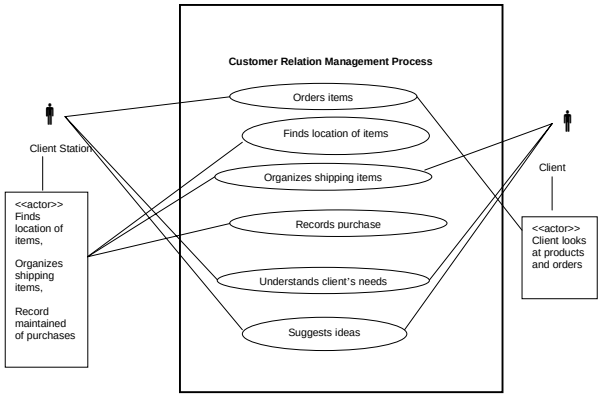


Figure 3. Use case diagram for business to consumer

* each enterprise use case-
  an oval with a name
  one use cases may include other use cases
  several use case may share some actions
  scenarios live inside use cases
* the actor's goal-
  a line between an actor and a use case (no direction) indicates a message into or out of the system

The elements of a use case diagram are-

- system name and boundary
- actors (picture or small box)
- communicate with (line)
- use cases (oval with name)

Business to Consumer (B2C) are systems that provide services when purchasing goods and services from the organization. The computer makes it easier to promote and sell electronically on the Internet. Clients can find what they need on the Internet that is retrieves information. Then they can order item and purchase it. Figure 3 describes the customer relationship management. The objective is to maintain and even raise the level of service to a client through finding out what the clients' current and future requirements will be. The goal is to use information that about the client's requirement to customize services and products to the needs of the clients. Clients can use the systems to follow orders and negotiate changes as new information becomes available.

(a) Client

The organization has a database of client profiles and produces that match these profiles in order to attract clients using the Internet [*knowledge assets*]. Clients find the products [*captured knowledge object*] that they need to buy. They can compare the quality and prices of the items from other organizations [*space*]. Most clients prefer a quick response [*time*] service to information about what they need. They find and consider the item that matches their requirement [*filtered knowledge object*] to order and purchase. Before they decide to order, they have knowledge about that product [*domain knowledge analysis*] which is most suitable for their needs. Then they decide to order the item [*transitioned knowledge object*] and notes [*knowledge consolidation*] the purchase this item [*consolidated knowledge*]. In the future, clients can find new updated item, they can consider new ideas [*knowledge modification*] to order and purchase.

(b) Client Station

The client station supports clients and their requirements using a database such as client information, transactions, supplier information, products and price lists [*knowledge assets*]. When client station receives orders from clients then organization has to find out and contact the supplier [*space*] and respond as quickly as possible to clients [*time*] so that clients can purchase the items. Organization ships the goods to clients and maintains records of purchase of the clients into their database [*knowledge assets*].

Organization can accumulate client requirements such as queries and quotes, customer feedback, FAQs, payment details and orders [*knowledge accumulate*] and service [*captured knowledge object*] as well as suppliers [*space*] and respond time to both suppliers and clients [*time*] in minimum time. To better customer service and good relationship with suppliers, organization has to find out which product is the one most clients prefer [*captured knowledge object*] where can get it [*space*] and how long it take to order to suppliers and respond to clients orders and shipping that item to clients [*time*]. Management can better understanding [*filtering knowledge*] the client needs and developing alternative solutions with the client responding quickly about price and delivery schedules [*filtered knowledge object*]. Organization analyzes and considers providing time and cost saving, exchanging transactions electronically with their business partners to reduce transaction processing costs [*domain knowledge analysis*] and creating new processes that take advantage of new business opportunities such as mass customizations, or joint product design in business [*transitioned knowledge object*] The existing system can be updated or modified to the new system when necessary changes in business processes are made [*knowledge modification*].

4. SUMMARY AND FUTURE WORK

This paper described the knowledge evolving process, which includes capturing filtering and transforming knowledge from explicit and tacit knowledge resources to consolidated knowledge specific to an application. The author proposed the knowledge evolving process model in business organizations, which is based on Nonaka's process, then integrates the model with a business process using use-case approach.

Further research is the application and implementation of this model in a business process. In this case, the author needs to investigate case studies.

ACKNOWLEDGMENT

The work reported in this paper has been funded in Faculty of Information Technology Doctoral Research Scholarship from the University of Technology, Sydney, Australia. The author would like to thank Igor Hawryszkiewycz, Julia Prior and reviewers for their comments on draft of this paper.

REFERENCES

Davenport, T.H and Prusak, L (1998) "Working Knowledge, How Organization Manage What They Know", Harvard Business School Press.

Godbout, M (1999) Filtering Knowledge: "Changing Information into Knowledge Assets", Journal of Systematic Knowledge Management, January 1999. www.it-consultancy.com/extern/systemic/knowfilter.html

Nonaka, I and Takeuchi, H. (1995) "The Knowledge Creating Company", Oxford University Press.

Plotkin, H (1994) "The Nature of Knowledge", Allen Press-Penguin, London.

Sellers, B and Unhelkar, B (2000) "Open Modeling with UML", ACM Press Book, Oxford, UK.

Skyrme, D. (2002) "The Knowledge Assets", www.skyrme.com.insights/11kasset.htm

Soo, C.W, et al (1999) "The Process of Knowledge Creation in Organization", Working Paper Series, AGSM, UNSW, Sydney, Australia. Spring 1999, 00125-145.