Business Model Framework for Knowledge Intensive Organizations

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***Abstract*—with arrival to knowledge economy and align with increasing in knowledge intensive organization, knowledge and intellectual capital become strategic assets of organizations. Today's organizations are operating in dynamic business environments, so they must have new business model that is knowledge oriented and could support them in competitive environment. This trend leads increasing number of organizations that are engage in knowledge management (KM) to improve competitive advantage. This paper starts with reviewing the exiting knowledge management frameworks to selects a framework that consist several element of KM. Also we briefly describe business models based on our purpose. The aim of this study is to develop a business model based on elements of knowledge management framework. The suggested business model is useful for knowledge intensive organization; applying such a framework could be helpful in improving the competitive position in dynamic business environment.**

***Index Terms*—Business model (BM), knowledge management (KM), framework, knowledge intensive organization.**

I. Introduction

Along with era of knowledge economy, knowledge and intellectual capital are now bases of a new source of wealth for organizations and are engines of economic and social development [1]. Knowledge intensive organization is developing quickly. These organizations create and appropriate value in unique ways and because the complex and multifaceted competitive landscape that they inhabit is very much unlike that of industrial firms [2] and many organizations started to implement knowledge management strategy (as well as including technology innovation strategy) in order to acquire knowledge superiority, core competencies and unceasingly promote own competitive advantage and market position [3].

In order to survive in the currently competitive and global business environment, most enterprises are struggling to change their existing business processes into more agile, product- and customer- oriented structures [4].

They have to resist with environmental changes, in order to gain a sustainable advantage, they need to use suitable business model. A business model is the combinations who, What, when, where, why, how and how much an organizations uses to provide it's goods and services and develop resources to continue its efforts [27]. Under the influence of knowledge economy and dynamic environment many current business model are not suitable therefore organizations must continuously develop and adapt their business model.

As a result, managers of knowledge intensive organizations need simple method of mapping competition in order to identify the best opportunities, to devise new business models, and to direct growth initiatives [2].

The structure of the paper is as follows: First, KM is defined and different framework for KM is presented.; then, the business model is described and based on our purpose BMO is selected to be altered for knowledge intensive organizations; in the next step the research method applied in this study is demonstrated; finally, the business model suitable for knowledge intensive organizations and based on KM cycle is suggested.

II. Knowledge Management

In order to respond to new challenges in the rapidly changing external environment, modern management needs to use knowledge from various sources [6]. Many organizations are claiming to have implemented Knowledge management. They currently engage in knowledge management in order to leverage knowledge both within their organization and externally to their shareholders and customers [7]. Most organizations will use a combination of knowledge management solutions as part of their enterprise wide knowledge management strategy [8].

Knowledge management is a process that helps organizations identify, select, organize, disseminate, and transfer important information and expertise that are part of the organization's memory [9]. Knowledge management characterizes a deliberate and systematic approach to ensure the full utilization of the knowledge base of an organization.

Tuyera illustrated the importance of knowledge management and benefits to the organization: 1.strengthens an organization of business foundations, 2. Increase revenues, 3. to share best practice, and share and transfer knowledge, 4. Fosters competitiveness and innovation [10].

A number of researchers have improved knowledge management frameworks. These frameworks can be broadly classified into two categories: descriptive and prescriptive frameworks. The descriptive frameworks attempt to characterize the nature of KM phenomena, whereas prescriptive frameworks prescribe methodologies to follow

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in conducting knowledge management [11].

TABLE I: A SAMPLE OF KNOWLEDGE MANAGEMENT FRAMEWORKS

Framework	Description
HUBER(1991)	Knowledge acquisition, Information Distribution,Information interpretation,organizational memory
Wiig(1993)	1. Exploring knowledge and its adequacy (survey & categorize knowledge, analyze knowledge & related activities, elicit, codify & organize knowledge), 2. Assessing value of knowledge (appraise & evaluate knowledge and related activities)
Nonaka (1994)	1- Socialization (tacit-to-tacit) 2 - Externalization (tacit-to-explicit) 3-Combination (explicit-to-explicit) 4- Internalization (explicit-to-tacit)
Nevis,E.C,Dibella,A.J, GOULD,J.M (1995).	1. Knowledge acquisition -- The development or creation of skills, insights, relationships.2. knowledge sharing- the dissemination what has been learned. 3. Knowledge utilization, The integration of learning so it is broadly available and can be generalized to new situations.
Alavi(1997)	1. Acquisition (knowledge creation and content development), 2. Indexing 3. Filtering, 4. . Linking (activities 2, 3, and 4involve screening, classification, cataloging, integrating, and interconnecting internal and external sources), 5. Distributing (packaging and delivery of knowledge in form of Web pages 6. Application (using knowledge)
Maha Muzumdar (1997)	Knowledge acquisition /generation, knowledge formalization, knowledge Deployment, knowledge utilization.
Liebowitz , Megbolugbe, (2003)	The knowledge management cycle includes the following steps: knowledge identification and capture, knowledge sharing, knowledge application, and knowledge creation
Burkhard, Eppler (2007)	1-knowldge types what? 2- KM functions why? 3- Target group for whom? 4- Situation when?

Many of the knowledge management frameworks focus only on the knowledge cycle process or tasks, and don't cover every parts of organizational knowledge management. For a framework become suitable for organizations and they can receive competitive advantage of knowledge management, the recommendations exit in knowledge management literature: 1) knowledge management tasks must be prescribed and should include such activities as finding,, verifying, storing, organizing, sharing, and using knowledge, 2) there should be a distinction between explicit and tacit knowledge and each needs to be handled appropriately , 3) single-loop learning should be part of the framework[7]. Table I identify and review of knowledge management frameworks that have been reported in the literature.

Many researchers have described several frameworks of knowledge management even if no Framework cover all elements and are applied to all organization, but lee and kim framework covers all elements of knowledge management and can be used for several organization. This framework has a holistic approach that considers the activities necessary; include additional elements of knowledge management as people, culture, leadership and technology. This framework includes knowledge worker, organizational knowledge, information technology and process knowledge management as shown in Fig 1.

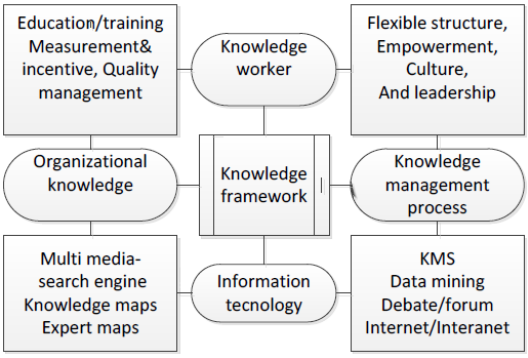

Fig. 1. Objects and organizational approaches [12]

III. BUSINESS MODEL

Knowledge intensive organizations are developing quickly, it's necessary that they create new business model for their organization. "A business model is nothing else than a description of the value company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenues streams [13].

Many researchers have introduced several business models and demonstrated components of business model. Business model include of many component but there does not exit a business model that applied for every organization.

Voelpel has introduced a business model, and his idea important parts of business model are:

1) New customer value proposition (which could also involve new customer base
2) A value network (re)configuration for that value creation;
3) Leadership capabilities that ensure the satisfaction of relevant stakeholders [14].

Business model components from viewpoint of Alt and Zimmermann include elements such as mission, process, legal issues and technology into their framework [15].

Linder and Cantrell propose a comprehensive business model. To outline your organization's operating business model follow these steps:

A. Identify all your Sources of Revenue.

Lay out the key factors underlying your ability to attract

and retain each revenue stream. These are your value proposition.

Lay out the key factors that enable you to deliver your value propositions profitably and consistently these make up your delivery model and your funding model.

B. Lay out the Leverage Able Assets, Capabilities, Relationships, and Knowledge that Result [16].

Osterwalder suggest adopting a framework which emphasizes on the following four areas that a business model and he split the four pillars of the business model ontology into nine interrelated business model building blocks.

1) Product: value proposition
2) Costumer interface: target costumer, distribution channel and relationship
3) Infrastructure management: Value Configuration, Capability, partnership
4) Financial Aspects: cost structure, revenue model [17].

Among well- designed business models, Business Model Ontology (BMO), presented by Osterwalder in his PhD thesis (2004), not only covers his previous studies and components that are mentioned by other researches, but also focuses on relationships between components. The level of description in this model is accommodating with our research goal to develop a generic mode for knowledge based organizations.

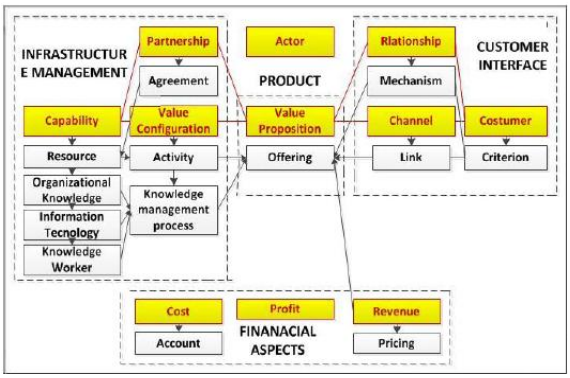

Fig. 2. Business model framework for knowledge intensive organization [18]

Based on our proposition BMO could be useful for knowledge intensive organization with some modification in infrastructure section. We would describe this section as follow:

C. Value Configuration

Value configuration block describes what abilities are necessary to provide its value proposition and maintain its costumer interface. [17]. Activities are at heart of what a business does. They are actions a company performs in order to create and market value and generate profits [17]. Activities are the basis for create value or products and services in general organizations, but activities produce new knowledge in knowledge intensive organizations. Therefor prominent activities are knowledge management process in these organizations. In fact the value chains or value configurations in knowledge based organizations focus on create, capture, refine, store, manage and dissemination of knowledge. Knowledge management is processes that clarify knowledge creation cycle (Table II).

Culture, leadership, debate/forum, and flexible structure influence on knowledge management process. There must be strong executive leadership, clearly expressed goals, user involvement in the system, and deployment of an easy-to-use that provides real value to employees [9]. For implement knowledge management process, organizational culture must be suitable. Therefore managers should re-examine their organizational culture, , because a culture that arouses employees' organizational commitment and encourages employees to participate in decision-making is most likely to increase willingness to share knowledge[18] An expanded community of practice (CoP) could pool the knowledge distributed across the organization and allow the accumulated knowledge to be shared and utilized enterprise-wide[19].

TABLE II: KNOWLEDGE MANAGEMENT CYCLE [9]

Create Knowledge	**Knowledge is created as people determine new ways of doing things or develop know-low, or external knowledge** is brought in
Capture knowledge	New knowledge must be identified as valuable and be represented in reasonable way
Refine knowledge	New knowledge must be in context so that is actionable
Store knowledge	Useful knowledge must then be stored in a reasonable format in a knowledge repository
Manage knowledge	The knowledge must be kept current. It must be reviewed to verify that is relevant and accurate
Disseminate knowledge	Knowledge must be made available in a useful format to anyone in the organization who need it

D. Capability

A capability describes the ability to execute a repeatable pattern of actions. Capabilities are based on a set of resources from the firm or its partner. [17] Organizations rely on their resources to create and propose value to customers. In knowledge intensive organization's resources include Knowledge worker, Organizational knowledge, and information technology that are necessary for these organizations.

1) Knowledge worker

The success of many Knowledge management systems has been attributed to the active involvement of the people who contribute to and benefit from using knowledge [9]. An organization cannot create knowledge without individuals. The organization support creative individuals or provides a context for such individuals to create knowledge [20].

The individual knowledge worker is the fundamental unit for knowledge creation, storage, and use within an organization [6]. An organization should identify their knowledge worker for fostering new knowledge. Commitment is one of the most important components for promoting the formation of new knowledge within an organization. There are three basic factors that induce individual commitment in an organizational setting: "intention," and "autonomy," and a certain level of environmental "fluctuation'' [21].

Education-training, empowerment, measurement and incentive, quality management influence on potationals of knowledge worker. Empowerment will recognise the potential in the social and individual for knowledge creation and sharing, in which the tacit as much as the explicit aspect

of knowledge is engaged [21]. Managers who wish to increase the incentive to share knowledge should first establish a harmonious atmosphere that fosters interpersonal congruence among employees' and encourages employees to work closely together [18].

2) Organizational knowledge

There are two types of knowledge in the organization; knowledge comprises both tacit knowledge and explicit knowledge. The critical success factor for implementing knowledge management is knowledge architecture. The knowledge architecture is designed to capture knowledge and thereby enable the knowledge management processes to take place [22]. The component of knowledge architecture are people (knowledge worker, writer, owner) process (the processes that knowledge workers use to achieve the organization's mission and goals) behaviors, technology, and content (the corporate knowledge base that is captured electronically) [22].

For creation new knowledge in the organization must be knowledge maps. A knowledge map generally consists of two parts: a ground layer that represents the context for the mapping, and the individual elements that are mapped within this context [23].

Knowledge map demonstrates the list of demands, information resources, knowledge creation resources and their real positions [22]. So important goal of knowledge map is creation knowledge and identify knowledge worker.

3) Information technology

Information technology is one of the elements for success implementing of knowledge management. This element helps to create knowledge and share them between workers. Information technologies and knowledge management initiatives are developing quickly and organization managers are facing challenging decisions for selecting information technology.

Turban [9] has illustrated knowledge management systems are developed using three of technologies:

1) *Communication technology* allows users to access needed knowledge, and to communicate with each other. Internet and intranet help to develop relation between workers in the organization.
2) *Collaboration technology* provides the means to perform group work. Organization worker can use this technology for sharing information and developing their knowledge. Via this technology, groups can work together in in different places and different times.
3) *Storage and retrieval technologies* originally meant using a database management system to store and manage knowledge. Search engine and data mining are storage and retrieval technologies. Data mining the extraction of hidden predictive information from large databases, is a powerful

New technology with great potential to help companies focus on the most important information in their data warehouses[24] search engine locating and retrieving necessary documents from vast collections accumulated in corporate repositories[9]

IV. Conclusion

Knowledge management will become more pervasive in organizations in coming years and for keeping sustainable advantages in competition market it is necessary for organizations that select and develop a share view of their business concept. Having a well- designed business model is essential for today's knowledge based organizations.

In this paper we proposed new business model based on knowledge management framework that is suitable for knowledge intensive organizations. We actually developed our model based on BMO framework and we expand the infrastructure pillar based on knowledge management framework.

Our proposed business model has four important components that constitute the essential business model issues of a company. We developed infrastructure management pillar based on comprehensive knowledge management framework. The value configuration component in our model is based on knowledge management cycle that leads to create and share of knowledge in organization. We also believe that resources in knowledge intensive organizations are somehow different from common organizations and could be divided in to 3 major categories: knowledge workers, organizational knowledge and information technology. Knowledge intensive organizations can accommodate their business model based on this suggested framework to gain competition advantages.

References

[1] A. Bustani, A. Molina, J. Cantu, and H. Moreira, "A knowledge-based development model: the research chair strategy," *Journal of Knowledge Management*, vol. 13, no. 1, pp. 154-170, 2009.

[2] N. Sheehan and C. Stabell, "Discovering new business models for knowledge intensive organizations," *Journal of Strategy and Leadership*, vol. 35, no. 2, pp. 22-29, 2007

[3] J. Wang and J. Xaio, "Knowledge management audit framework and methodology based on processes," *Journal of Technology Management in Chin*, vol. 4, no.3, pp. 239-249, 2009.

[4] J. W. Park and K. H. Han, "Process-centered knowledge model and enterprise ontology for the development of knowledge management system," *Journal of expert systems with applications*, pp. 7441-7447, 2008.

[5] M. Coles, "business model innovation breakthrough Moves," *Journal of business strategy*, vol. 25, no. 1, pp.16-26, 2004.

[6] J. Lee and R. W. Kwok, "A fuzzy GSS framework for organizational knowledge acquisition," *International Journal of Information Management*, pp .383-398, 2000.

[7] M. Liebowitz, B. M. Caw, and N. Rebeck, "A systems thinking framework for knowledge management," *Journal of Expert Systems with Applications*, pp. 5–16, 2001.

[8] J. Liebowitza and L. Megbolugbeb, "A set of frameworks to aid the project manager in conceptualizing and implementing knowledge management initiatives," *Published by Elsevier Science Ltd and IPMA*, 2003.

[9] E. Turban, E. Mclean, and J. Wetherbe, "Information Technology Management," *Transforming Organization in the Digital Economy*, 2006.

[10] S. Teruya, "An Analysis of the value of implementing knowledge management," *Pepperdine university, United States code*, pp. 173, 2003.

[11] W. C. Holsappele and K. D. Joshi, "Description and Analysis of Existing Knowledge Management Frameworks," in *Proceedings of the 32nd Hawaii International Conference on System Sciences*, 1999.

[12] J. H. Lee and Y. G. Kim, "A stage model of organizational knowledge management: a latent content analysis," *Journal of Expert Systems with Applications*, pp. 299-311, 2001.

[13] P. Giaglis, "A Framework for Understanding and Analysing eBusiness Models," *16th Bled eCommerce Conference eTransformation Bled, Slovenia*, pp. 9 – 11, 2003.

[14] V. L. Tekie, "The wheel of business model reinvention: how to reshape your business model to leapfrog," *Journal of change management*, 2004.
[15] R. Alt and H. Zimmermann, "Introduction to special section- business models," *Electronic Markets11*, vol. 1, pp. 3-9, 2001.
[16] J. Linder and S. Cantrell, "Changing Business Models: Surveying the Landscape," *Accenture Institute for Strategic Change*, 2000.
[17] A. Osterwalder, "The Business Model Ontology - a proposition in a design science approach," *Ph.D. thesis, In Institute 'Informatique et Organization, University of Lausanne, Ecole desHautes Etudes Commercials HEC, Lausanne, Switzerland*, pp. 173. 2004.
[18] Lin, "To share or not to share: modeling knowledge sharing using exchange ideology as a moderator," *Journal of Personnel Review*, vol. 36, no. 3, pp. 457-475, 2007.
[19] Z. Watts, "Online communities as communities of practice: a case study," *Journal of Knowledge Management*, vol. 12, no. 4, pp. 55-71, 2008.
[20] I. Nonaka, "A dynamic theory of organizational knowledge creation," *Organizational Science*, vol. 5, no. 1, 14-37, 1994.
[21] A. Meakins, "A Framework for Practising Knowledge Management," *Journal of Long Range Planning*, vol. 35, pp.49-71, 2002.
[22] J. A. Nouranipour, "Developing an architecture model for enterprise knowledge," *Journal of Management Decision*, vol. 47, no. 5, pp. 730-759, 2009.
[23] E. Burkhard, "Visual representations in knowledge management: framework and cases," *Journal of knowledge management*, vol. 11, no. 4, pp.112-122, 2007.
[24] F. Ogunde, "Data mining as a technique for knowledge management in business process redesign," *Journal of Information Management and Computer Security*, vol. 13, no. 4, pp. 274-280, 2005.
[25] G. Huber, "Organizational Learning: The Contributing Processes and Literture," *Organzional Cience*, vol. 2, no.1, University of texas, pp. 88-115, 1991.
[26] E. C. Nevis, A. J. Dibella, and J. M. Gould, "Understanding organization as learning systems," *Sloan Management Review*, winter, 73-85, 1995.
[27] M. Muzumdar, "organizational knowledge management (OKM) framework and a case study," *Ph.D, kent state university*, pp. 171, 1997.