
The role of information brokers in knowledge management

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Abstract

The way of managing the challenges of "information era" by business entities is the litmus for success nowadays. Professional competencies and special skills for managing information and information resources are needed. The paper discusses the role of information brokers as the joining link in facilitating success in the knowledge economy. This role is composed of the roles of surveyors, analysts, creators of secondary information, and finally knowledge disseminators.

Keywords: information, knowledge, information broker, knowledge management

Introduction

In every period of the history human society has faced specific challenges and developed tools to address them. "Information society" and "knowledge economy" are terms used to describe the basic property of the times we are living in now. What are the challenges the human society faces today? What are the instruments that may help in overcoming those challenges?

The rise of information and communication technologies and invention of the World Wide Web has had a large impact on the evolution of society and globalization. The barriers that once hindered our ability to communicate and interact with people across the world have diminished. The modern information society is characterized by exponential growth of the volume of data accessible practically free of charge via the Internet. But the volume itself doesn't represent the whole picture of the challenges the management of a business entity faces today. A list of those challenges includes, but is not limited to:

- Volume of accessible free of charge data. The volume of accessible relevant data grows continuously and has long before now reached the upper limit of human cognitive ability.
- The cost to access the most precious sources. Still, the most precious information is not provided for free. But the cost doesn't include only money paid to obtain it. The cost includes efforts to identify, locate, access, assess and process data.
- Increased need of verification. Nowadays everybody can post information without guarantees of its correctness, completeness, often without a clear description of the context in which the data are obtained and limitation of data validity.
- Dependence on information. Business entities, but not exclusively, are more and more dependent on information and knowledge. Information resources are gradually becoming the most precious resource. Managing information, or the ability to make informed rational decisions, is no longer a hallmark of maturity. Managing

information in a way to guarantee availability of relevant and valid information when necessary, in a needed format is becoming critical for success.

- Globalization challenges the business in many ways by increasing competitions in every facet of economy. But the major challenge is informational – the diversity of languages, cultures, jargons, formats, media, etc. affects the posted information and requires deep understanding to benefit by extracting useful knowledge.
- Dynamics. Last, but not least important is the increasing dynamics of business. Time to make decisions is becoming less and less, limiting the possibility to allocate sufficient resources in data collection and processing.

Exploring "the Big Data" available today to acquire knowledge regarding the processes, motivation and cause-and-effect, in a needed pace, effectiveness and efficiency is the major challenges faced by businesses. This requires understanding human abilities, limitations, and inclinations in seeking information and knowledge. Fundamental understanding of why and how people value information and knowledge is essential to maximizing chances to meet their needs successfully. This paper discusses the role of a recently defined profession of the information broker (IB) as a possible answer to the challenges of the "information era". The IB plays a crucial role in the mediation between information resources and the users of information. This kind of expertise requires special training and professionally oriented education (Christozov, Denchev, Toleva-Stoimenova, & Rasheva-Yordanova, 2008).

This paper is organized in two sections. The first section addresses the concepts of knowledge and knowledge management. The second section introduces the profession of IB and discusses their role in knowledge management processes. The conclusion summarizes the role of IB in knowledge management as a facilitator of success in the modern economy.

Knowledge and knowledge management

Data has commonly been seen as simple facts that can be structured to become meaningful information. Information, in turn, becomes knowledge when it is interpreted, put into context, or when meaning is added to it. This view represents data as a prerequisite for information, and information as a prerequisite for knowledge (Belkin & Robertson, 1976; Buckland, 1992; Drucker, 1988;). There are several variations of this widely adopted theme. Some authors even argue that all data and information is collected based on influence from existing knowledge (Tuomi, 2000).

Improvements in information and telecommunication technologies greatly increased people's ability to access, share, assess and apply various sources of information. Various information is available in different sources so it is important to choose those which will provide relevant information. Through learning and adoption, information can be changed into knowledge. Knowledge is always bound to the persons and validated in the context of the application. Some researchers suggest differentiation between tacit, explicit, and cultural knowledge (Boisot, 1999; Choo, 2000). The term tacit knowledge was first introduced by Polanyi (1958). He means that there is a type of knowledge that is not captured by language or mathematics. Polanyi points out that most of the body of knowledge is made up of tacit knowledge that exists in people's hands and minds and manifests itself through their actions. On the contrary, explicit knowledge can be

easily articulated and disseminated, captured and codified in manuals, procedures, and rules. Cook and Brown (1999) delineate four forms of knowledge, which we will use in our later discussion:

- a) Explicit-individual (concepts): Examples include engineering formula calculation and basic spreadsheet manipulation.
- b) Tacit-individual (skills): Examples include managing teams and troubleshooting unusual exceptions.
- c) Explicit-group (stores): Examples include formalized processes and patents.
- d) Tacit-group (genres): Examples include corporate culture and norms of communication.

Identifying knowledge as a critically important resource, defines the need of proper management of the process of creating, recording and using knowledge or the process of managed learning. Knowledge management arose as a concept and discipline from the business world recently. One of the most commonly used connotations of knowledge management is that it is a collection of processes that govern the creation, dissemination, and utilization of knowledge in an organization (Newman, 1991). Davenport & Prusak (1998) give a more comprehensive definition of knowledge management and its implications. Knowledge management is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives. The knowledge to be managed includes explicit, documented knowledge and tacit, subjective knowledge. Management of this knowledge entails all the processes associated with the identification, sharing and creation of knowledge. This requires systems for the creation and maintenance of knowledge repositories, and to cultivate and facilitate the sharing of knowledge and organization learning. Organizations that succeed in knowledge management are likely to view knowledge as an asset and to develop organizational norms and values, which support the creation and sharing of knowledge (Davenport & Prusak, 1998). Generally speaking, this discipline is concerned with managing both recorded (i.e. explicit) and tacit knowledge.

A lot of knowledge management models have been proposed over the last years. Von Krogh, Roos, and Kleine's (1998) model is based on an epistemological approach emphasizing the idea of knowledge that is to be found both in the individual mind and in the interpersonal relations. Choo's (1998) model adopts an approach through which it tries to define the sense by analyzing the way that informational elements are found in organizational actions. Wiig's (1993) model is mostly based on the principle stating that knowledge can be useful only when it is organized using semantic networks, in order to ensure perspectives and purposes.

One of the most widely cited theories in knowledge management is Nonaka's SECI model (see Figure 1), emphasizing knowledge processes of interaction between explicit knowledge and tacit knowledge. (Nonaka, 1994; Nonaka & Takeuchi, 1995). The model of organizational knowledge creation was elaborated later by Nonaka and Konno (1998). It consists of four major elements: (1) the SECI model, the process of creating new knowledge through interaction and conversion between tacit and explicit knowledge; (2) a shared context for knowledge creation; (3) knowledge assets as inputs and outputs of the knowledge-creating process; and (4) knowledge

leadership that provides enabling conditions conducive to the process. These four elements interact with each other in “management by creating new knowledge continuously.”

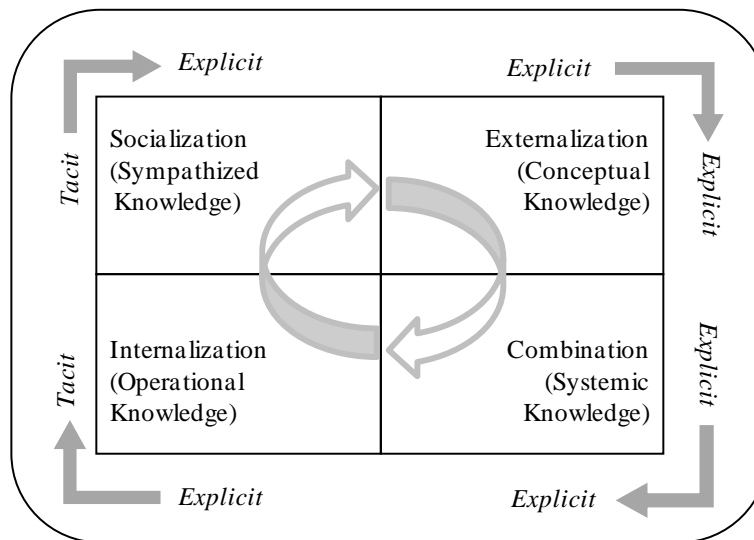


Figure 1: Nonaka's (1994) SECI model

He makes the assumption that knowledge is created through conversion between tacit and explicit knowledge allows us to postulate four different modes of knowledge conversion: "(1) from tacit knowledge to tacit knowledge, (2) from explicit knowledge to explicit knowledge, (3) from tacit knowledge to explicit knowledge, and (4) from explicit knowledge to tacit knowledge". The process of creating tacit knowledge through shared experience has been called socialization. This process of manipulating explicit "systemic" knowledge through such techniques as sorting and combining has been called a combination. The third and fourth processes are different from the previous ones since they involve both types of knowledge. These transformation processes are based on the idea that tacit and explicit knowledge are two complementary forms of knowledge in a continuous interaction. The third process of articulating "conceptual" tacit knowledge explicitly through the use of such techniques as metaphors and models has been called externalization. The fourth process is dealing with transformation of explicit knowledge into tacit knowledge, and it has been called internalization. This is "learning by doing" (operational knowledge) and sharing mental models and technical know-how. The first three processes are related in Nonaka's (1994) view of organizational learning, while the last one is related to individual learning.

Nonaka's (1994) model is based on a study of Japanese organizations, which heavily rely on tacit knowledge: employees are often with a company for life. Hong (2010) argues that the success of supporting the members' participation in each of the above four modes in the SECI model should depend on how well they (1) identify and interrelate with each other, (2) reveal their deep thoughts and emotions to others, (3) support joint actions and (4) achieve a synthesis by abandoning preconceptions and incorporating new ideas into practice. And these can all be attributed to the two inherent, deep-seated Japanese cultural values for dealing with interpersonal

relationships and managing uncertainties. Nevertheless, the phases described by Nonaka (1994) represent a mutually accepted view regarding the actual knowledge transfer, especially the phases of transfer tacit to explicit and explicit to tacit.

Our vision regarding the activities which every Knowledge Management process includes is described in Figure 2:

- Creating knowledge via observing, sensing, surveying, finding, analyzing, synthesizing or solving problems via exploring creatively one's own experience, etc.
- Capturing and refining addresses identifying the solution as a valuable asset and converting it to a more general, more abstract way of solving problems
- Recording - transforming tacit to explicit knowledge
- Disseminating or transferring explicit knowledge, transforming explicit to tacit.

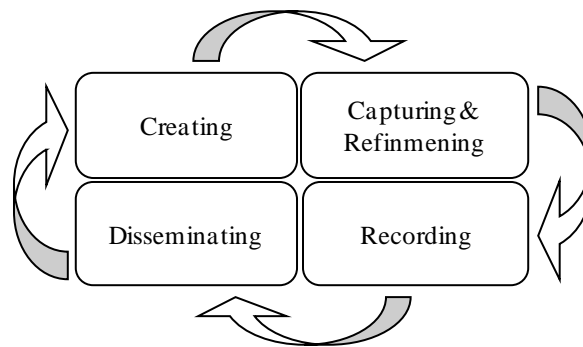


Figure 2: Knowledge Management Loop

There are two major aspects of knowledge management - internal and external. The first addresses learning by an individual to obtain an ability to solve certain problems. The second - externalization - refers to knowledge dissemination - to share knowledge in a way so as to allow others to obtain an ability to solve the same problems in the same way. Or the two major tasks of knowledge management are to encourage learning and sharing.

Information Brokers and Knowledge Management

The increasing complexity of the external environment imposes upon the organization a greater demand for processing information and making quick and rational decisions. Information brokerage is the profession of information mediators. Professionals are entitled to assist clients in surviving in today's world and facing the challenges of the information era. The major role of an IB is to serve their clients by presenting in a "nut shell" the essence of information relevant to the client's problems. Often, the information entity created by an IB is added to the information environment as secondary information and may serve other clients as well. In this way, IBs are both users of and contributors to the information environment.

There are three categories of competences an IB needs to master in order to be successful in this profession, presented in Figure 3 (Denchev & Christozov, 2012):

1. To be able to survey, scan and search the information sources, by exploring all of the components of Information environment.
2. To collect and store the obtained information and to structure, analyze, summarize and visualize it in a form suitable to serve the client. A special skill is to map available information to the problem in a creative way by combining data from different sources to discover the potentially best solution.
3. The last category includes presentation skills. Often this is not limited to present findings to a particular client, but requires preparing information suitable for use by the general public.

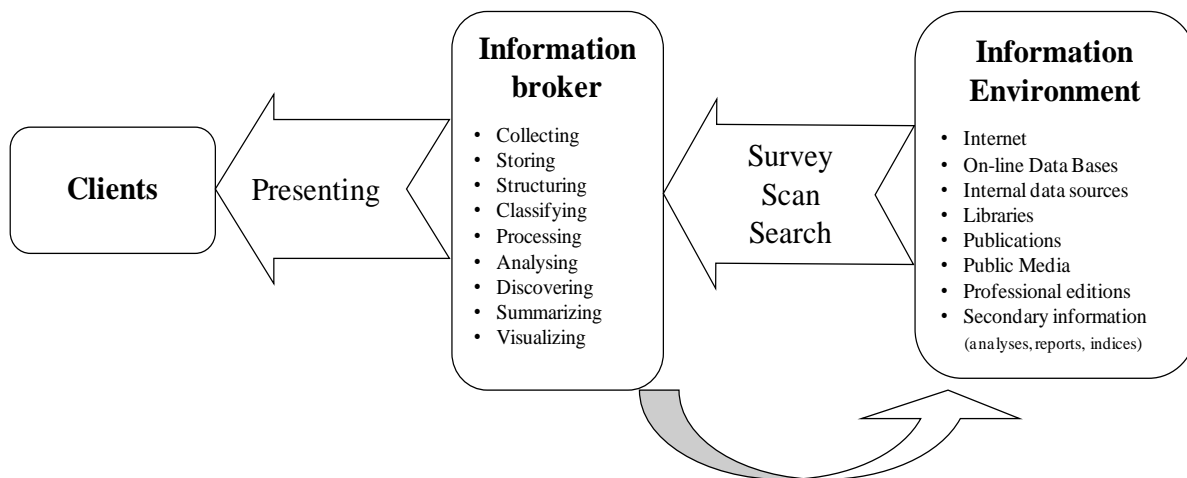
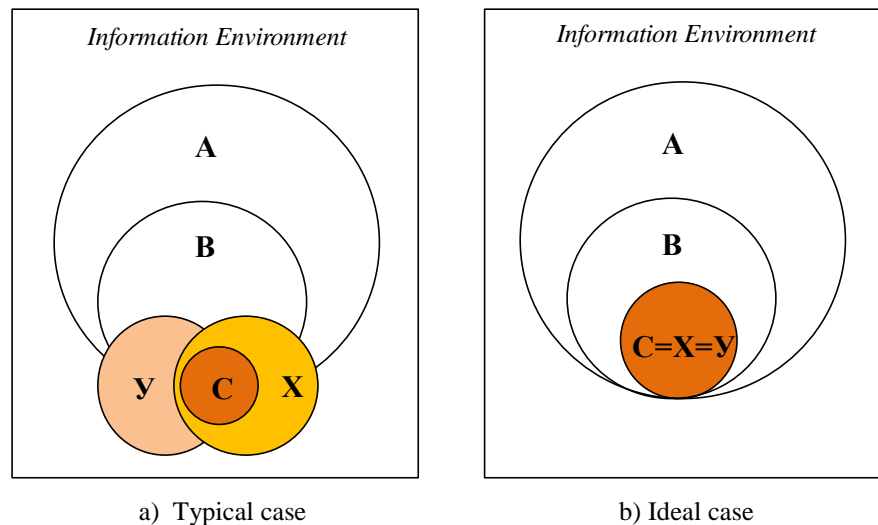


Figure 3: The position of IB in the process of information acquisition

The business process of an IB job includes the following activities:

1. Surveillance of the information environment - identifying relevant to the problem domain information sources
2. Researching the sources from the point of view of relevance and accessibility, including price ()
3. Collecting (obtaining) subjectively defined relevant information among what's available (see Figure 4)
4. Analyzing obtained information from the point of view of relevance, trustfulness, consistency, cause-and-effects relationships, etc.
5. Synthesizing knowledge - an information product by formulating the obtained content to serve the client - via creative generalization and abstraction
6. Presenting information to the client (teaching)

7. Disseminating



- A- Area of accessible information
- B- Area of obtained information
- C- Area of obtained information, subjectively recognized as relevant
- X- Area of information, subjectively recognized as relevant
- Y- Area of objectively relevant information

Figure4: Complexity in surveying in the information environment
(Adopted by Schoderbek, Schoderbek, & Kefalis, 1990, p. 209)

The problem of integrating heterogeneous data and information sources Data Warehouses Managerial skills are an additional special category, which refers to the ability to organize the entire process of information processing and knowledge management, including assessment of needs, planning of activities and resources, and controlling performance.

The role of an IB is to complement the domain competences possessed within a business entity with the competences to deal with information, creating a mix with a synergy potential, which leads to success. In this role, the experts possessing competences of IB serve as facilitators of the success in the knowledge economy.

The role of an IB in the process of knowledge creation

In the present information and knowledge era, knowledge has become a decisive factor for business success. The modern company recognizes the most business processes as a process of knowledge. Therefore, knowledge is considered a strategic company's resource, the source of competitive advantage and business success.

Knowledge creation is the most important stage - it initiates the process. Nonaka (1994) has mapped the knowledge creation process from the tacit and explicit knowledge available in an organization. Most of the knowledge in organizations exists as tacit knowledge gained and built-up through years of experience. This knowledge has to be captured and stored in databases. The

knowledge created and captured through would then need to be applied to achieve competitive advantage.

Two conditions have to be met to create a new, innovative solution to a given problem - new knowledge of how to solve the problem. Firstly - availability of domain knowledge, which will allow assessing the usefulness and applicability of generated or whether the idea represents a solution to the problem; and secondly - skills to deal with information, which will allow comprehensive investigation of available solutions, and recognizing whether the solution is really new, innovative and why it is better than the existing one.

The role of an IB in capturing and refining knowledge

Capturing knowledge is the natural follow-up of knowledge creation. Often, the individual who actually possesses the knowledge doesn't even recognize its value or is not capable of expressing it in an explicit form. This fact is recognized by numerous researchers. Close collaboration with an information skilled person, like an IB, is essential to the success of capturing knowledge.

Refinement of knowledge is a process to view the potential of the idea generated to solve a particular problem in solving a group of similar problems. This requires methodological attitude and an ability to distinguish essential aspects and identify what represents the similarity between the problems and respectively, the difference.

The role of an IB in converting tacit to explicit knowledge: recording knowledge

Developing an informative representation of created knowledge is a typical task of an IB. To carry out this task effectively the IB needs to know how the business is intended to use the knowledge, who the audience and potential recipients are, what their background and professional jargon are, etc.

The skills possessed by an IB include competencies in structuring, analyzing and summarizing the information, which directly corresponds to the need of this activity. Very often, the creators or possessors of new knowledge are not able to explain it in an informative way. The cooperation with an IB will create the synergy needed for effective transferring of tacit to explicit knowledge.

The role of IB in converting explicit to tacit knowledge: disseminating knowledge

Converting explicit to tacit knowledge is the area where competences of an IB may play the most important role. The two aspects – organizing training activities and preparing training materials – are in-line with the very essence of this profession.

Two fundamental components of an IB competence are involved. First are the presentation skills. For success in knowledge dissemination the way of presenting explicit knowledge is critically important. The information product created has to allow not only to be understood by a diverse audience, but also to pass rejecting filters such as trust, acceptance, usefulness, etc. Last but not least is exploring cultural aspects of knowledge acquisition in a particular entity to guarantee that the knowledge disseminated will not be ignored.

Second are the managerial skills, which refer to how the process of dissemination is organized and managed. Addressing cost-benefit assessment, scheduling, resource allocation and other related issues are also necessary for successful dissemination.

Conclusion

A success formula in a modern economy is to combine the domain expertise with information expertise. Utilizing information, creating and exploring knowledge is the only way to achieve competitive advantages. In a global, dynamic and highly competitive environment, achieving competencies at a required level in all relevant areas has become more and more difficult. The time of single experts, capable of solving problems in a professional manner has gone. Even though the role of an IB seems secondary, the involvement of professionals possessing such competences is essential to guarantee the success of knowledge management and to completely benefit from created innovations.

A feedback from employers was collected in a survey regarding the performance of alumni, graduated in the Information Brokerage major, at the State University of Library Studies and Information Technologies. The majority shared that such specialists manage to improve the overall organization of information gathering, flows and knowledge sharing. In this way those alumni illustrated the potential of IB to serve as a facilitator in knowledge dissemination.

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Biographies

Dimitar Christozov is a Professor of Computer Science at the American University in Bulgaria. He has more than 30 years of experience in areas such as computer science, quality management and information systems. He graduated in Mathematics from Sofia University "St. Kliment Ohridski" in 1979. He completed his PhD thesis "Computer Aided Evaluation of Machine Reliability" in 1986. In ICTT "Informa" (1986-1993) Dr. Christozov was involved in establishing the national information network for technology transfer and research in the areas of technologies assessment, integral quality measures and information systems for quality management. In these areas he has been recognized as one of the leading experts in Bulgaria. Professor Christozov has more than 50 publications as separate volume, journal papers and papers in refereed proceedings. He is a founding member of the Informing Science Institute and chair of the Bulgarian Informing Science Society; and a member of the Bulgarian Statistical Society.

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