DEFINING PRIORITIES OF KNOWLEDGE MANAGEMENT TOOLS IN TURKEY

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Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science

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This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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SUMMARY

DEFINING PRIORITIES OF KNOWLEDGE MANAGEMENT TOOLS IN TURKEY

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Knowledge Management has been an important factor in business administration starting from the late 90's. This thesis has tried to map the most common knowledge management tools and attempted to determine priorities of the implementations' order and extent via a survey directed to Turkish knowledge professionals.

Key words: knowledge, knowledge management, knowledge management tools

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1. INTRODUCTION

Knowledge Management (KM) has been a hot topic in business management throughout the first years of the new millennium. Companies, in order to improve their performance and responsiveness, devised and implemented concepts like “Total Quality Management”, “Business Process Re-Engineering” and “Learning Organization” into their structures.

Through these concepts, companies devised how they could improve their performance and keep up with the rapidly evolving market. With the recent improvement of company wide Information Technology (IT) infrastructures, new methods for enhancing cooperation and utilizing previous experiences have found great recognition.

With the increasing percentage of knowledge workers in the economy, companies felt the need to structure their knowledge flow and enhance their knowledge base, just as the companies of earlier decades felt the need to structure their product and material flows.

The product/material flow structures took decades to implement in an orderly fashion, even though aspects in discussion were solid concepts such as merchandise or material. Knowledge cannot be defined even as liquid.

In order to be successful you have to implement the tools that will enable the employees to share it, you will also need to sometimes capture it, afterwards you will definitely need to materialize it, and finally you have to make it available in an orderly fashion.

A lot of companies in the world over emphasized on capturing too much and captured much more material than they could ever offer in an orderly fashion.

(Companies that relied too much on sharing failed because they did not try to influence the culture of the company and surrounding environment.)

What this dissertation aims at is listing the basic effective tools in Knowledge Management, taking the judgments of professionals about these with in a detailed survey and deduct which set of tools have greater priority on our participants' view.

This study yields with, a basic set of priorities for knowledge management tools in our business environment that will guide the companies and professionals on what to implement and how to implement.

After the introduction, this dissertation goes on with a literature review, defining concepts such as Knowledge and the Knowledge Processes in Chapter II.

This section is followed by Knowledge Dynamics; Channels and Functions, building on the concepts of pioneering Nonaka, the thesis takes into account the dynamics that enable us to define our tools for handling knowledge.

Chapter III tackles Knowledge Management concept and offers several definitions before moving on to Knowledge Management structural analysis, discussing in detail about goals and expectations.

Chapter IV is about identifying effective Knowledge Management tools. This thesis looks at a few different perspectives of how to define Knowledge Management tools. In the following section a list the primary KM tools that have the chance of having a successful impact on organizations have been compiled.

Chapter V is about designing and analyzing the survey statistically, followed by a discussion on the results of the survey.

The conclusion will try to define priorities based on the results.

2) KNOWLEDGE

There are three types of organizations; those that wonder what has happened, those that watch things happening and those that make things happen. What discriminates these types of organizations is the amount of knowledge they possess and process.

2.1) Description of Knowledge

Acknowledgement of an organization's knowledge and expertise is immensely valuable is not new. In the 1960's, a story circulated about Edwin H. Land, developer of the instant camera, CEO of the Polaroid Corporation, second to Edison in the number of patents received. The setting of the story was a tax dispute between Polaroid and the Internal Revenue Service that centered on how Polaroid valued its inventory and its assets. Land was alleged to have left one meeting with the IRS representatives muttering to his aides, "Those guys don't have the slightest idea what an asset is, ninety percent of Polaroid's assets get in their cars and drive home at night". (Koenig, 1999)

Knowledge is edging out buildings and equipment as the essential business asset. In an environment in which companies must innovate or die, their ability to learn, adapt, and change becomes a core competency for survival. Most seek more knowledge through training, education, and career development.

The knowledge economy has brought new power to workers. Workers own the means of production, their knowledge. They can sell it, trade it, or give it away but still own it. As a result, the ways how we manage people have undergone a dramatic, fundamental shift.

Knowledge is perishable. The shelf life of expertise is limited because new technologies, products, and services continually pour into the marketplace. No one can stack knowledge. People and companies must constantly renew, replenish, expand, and create more knowledge.

Table 2.1: Data, information, knowledge characteristics (Teruya, 2003)

Unit	Examples	Characteristics
Data	A number or a name	Numeric discrete and objective facts and transactions
Information	A sorted list, chart	Formatted, filtered and summarized data in structure form
Knowledge	A report on which executives formulate business strategies	Information for decision making

2.2) Four Levels of Knowledge

Quinn *et al*. (1998) offer a concept on the evolution of knowledge. Each of their four levels of knowledge has distinct human and cultural implications:

1. **Cognitive knowledge** (or "know-what") is the "basic mastery of a discipline that professionals achieve through extensive training and certification". This suggests that explicit knowledge can be written down and effectively communicated to others on the basis of personal instruction or learning.

2. **Advanced skill** (or "know-how"), translates 'book learning' into effective execution and demonstrates the ability to apply the rules of a discipline to complex real-world problems. Quinn *et al.* (1998) believe this to be the most widespread value-creating professional skill level. This appears similar to the four phenomena involving translating explicit to tacit knowledge as discussed by Nonaka (1998).

3. At the heart of **systems understanding** ("know-why") is a deep knowledge of the web of “cause-and-effect” relationships in a specific discipline. Professionals

with this type of knowledge can move beyond the execution of tasks to solve larger and more complex problems, and create extraordinary value. Quinn *et al.* (1998) admit that this level requires highly trained intuition. The insight of a seasoned research director who knows instinctively which projects to fund and exactly when to do so is an example for this.

4. **Self-motivated creativity** ("care-why") is found in successful and creative groups and consists of will, motivation, and adaptability for success. (Quinn *et al.*, 1998) This attribute is essential for organizations to thrive in the face of today's rapid changes. They can renew their cognitive knowledge, advanced skills, and systems understanding in order to compete in the next wave of advances. The first three levels can exist in the organization's systems, databases, or operating technologies, but the last level is often found in its culture.

2.3) The Knowledge Processes

After defining knowledge it is important to define the knowledge processes that are effective in knowledge dynamics.

2.3.1) Knowledge generation

Knowledge generation is the process of developing new content or replacing existing content in the organization's knowledge (Alavi and Leidner, 2001). The process of knowledge generation discussed in this framework is distinguished from the macro level 'organizational learning' construct and focus on the individual and group processes that lead to the creation of new knowledge(Schulz, 2002),.

Organizational knowledge can be created or acquired through various organizational learning processes (Stein, 1995; Walsh and Ungson, 1991). Nonaka (1994) presents a theory of organizational knowledge creation that is initiated by

individual learning, which then spreads across the organization through various communication mechanisms. The theory builds on interactions between tacit and explicit knowledge. Tacit knowledge is highly personal and hard to formalize, while explicit knowledge is expressed using formal representation and can be communicated easily. Nonaka describes a model of organizational knowledge creation that draws on four patterns of interactions between tacit and explicit knowledge, namely Socialization (from tacit to tacit), Combination (from explicit to explicit), Externalization (from tacit to explicit), and Internalization (from explicit to tacit). He argues that the knowledge process begins with a generation of new individual tacit knowledge through experience. Socialization then follows, involving the construction of a 'field of interaction' whose members share experiences and perspectives. Dialogues between members allow the conceptualization of the tacit knowledge and trigger externalization. Next follows combination of the new knowledge with existing explicit knowledge and finally, the new concepts are mastered through experimentation and internalized. Once this process is completed the new knowledge is evaluated and if proven useful, stored. According to this model, individual learning and socialization are two processes that play a key role in the generation of new knowledge. The other processes are mainly channels through which this generated knowledge is communicated and stored across the organization.

When referring to tacit knowledge, we are not usually talking about a new breakthrough technology, or a revolutionary process, it is usually about a remarkable simple process, and how to get it done swiftly and flawlessly.

Palo Alto Research Complex (PARC) anthropologist Lucy Suchman discovered in 1979 that the company Xerox's clerks described how they did their jobs more or less according to the formal procedures outlined in the job manual.

However, she observed that in practice, these employees did not follow these procedures, but relied instead on a rich variety of informal practices that weren't in any manual but turned out to be crucial to getting the work done (Brown,1998). These people turned out to be far more innovative and creative than anybody who heard them describe their 'routine' jobs ever would have thought, constantly inventing new work practices to cope with the unforeseen contingencies of the moment (Brown, 1998). Based on these findings, PARC decided to just get out of the way of such innovation, focusing instead on designing new uses of technology that leverage the incremental innovation coming from within the entire company.

Regarding the socialization aspect, Argote and Ophir (2002) provide support for the importance of teams in the process of knowledge creation. Knowledge creation can be enhanced by the heterogeneity of group members, by the existence of social networks (Rulke et al 2000), or by group brainstorming processes (Paulus and Yang, 2000).

The above discussion provides evidence that knowledge generation, or the creation of new content, mainly involves individual learning and socialization that enhances learning and generates new collective knowledge.

2.3.2) Knowledge Codification

Knowledge codification includes the capture, representation, and storage of knowledge in knowledge bases and the representation of this knowledge in a communicable way (Ruggles,1997). Organizational knowledge is distinguished from organizational memory, which stores knowledge from the past to support present activities (Stein, 1995). Organizational knowledge is often codified and stored in the

various retainers of organizational memory. Walsh and Ungson (1991) analyze organizational memory and describe five retainers of it:

Individuals, who retain knowledge in their memory stores or in their belief structures, values, or assumptions;

Culture that stores knowledge in language, shared framework, symbols, and stories;

Transformations, procedures, and rules which include embedded knowledge such as the logic behind them;

Structure and roles that represent the organization's perception of the environment, and social expectations;

Physical settings of the workplace represent knowledge about status hierarchy and behaviour perceptions.

Organizational knowledge can also be stored in retainers external to the organization, such as government agencies, market reports, and others. The acquisition of knowledge into the retainers of organizational memory involves the process of learning. This process was described earlier as knowledge generation.

2.3.3) Knowledge Transfer

Knowledge transfer is a process through which one unit (e.g., individual, group, department, division) is affected by the experience of another (Argote and Ingram, 2000).

Knowledge transfer is distinguished from the traditional 'knowledge sharing' concept by the requirement for evidence of results of the transfer.

Dixon (2000) identifies five types of knowledge transfer in organizational teams:

1) **Serial transfer** occurs when a team applies past knowledge to new tasks;

2) **Near transfer** involves applying a team's knowledge in other teams;

3) **Far transfer** is similar to near transfer only it also involves non routine tasks and tacit knowledge;

4) **Strategic transfer** occurs when a team takes on an infrequent task and seeks to gain from the experiences of other teams that have engaged in a similar task;

5) **Expert transfer** occurs when a team faces a technical problem beyond its knowledge and seeks expert help from others in the organization.

2.4) Knowledge Dynamics; Channels and Functions

Nevo (2003) used classic model of a communication system analyze the process of knowledge transfer. According to his model, a communication system consists of five parts: the source that produces a message, the transmitter which transforms the message into the signal that can be transferred, the communication channel that serves as the medium for the transfer, the receiver that inverts the operation of the transmitter, and the destination, to whom the message is intended. Nevo specified two specific communication channels exist that bring knowledge to knowledge seekers:

1) Directly communicating knowledge through socialization, or more generally through communications between individuals or groups;

2) Indirect retrieval of captured knowledge from codified organizational memory. This is depicted in Figure 2.1.

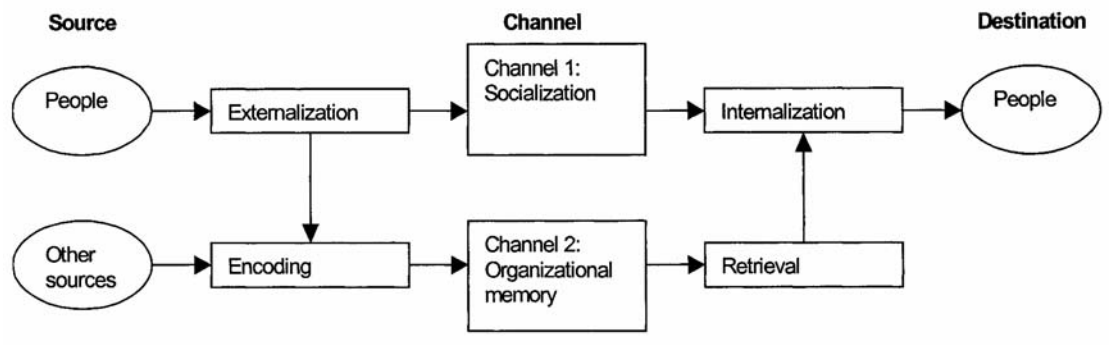

FIG 2.1 Channels for knowledge transfer in organizations (Nevo, 2003)

2.4.1) Knowledge Channels

Nevo (2003) defines the socialization channel on the basis of socialization described by Nonaka (1994) but also includes other acts of communicating knowledge between individuals without limiting to the transfer of tacit knowledge as in Nonaka's model. The socialization channel can be described in terms of communities of practice (Brown and Duguid, 1991). Such communities involve members of a close workgroup that share knowledge and experiences in order to overcome practical problems. Socialization is a personal informal communication channel in which knowledge is transmitted in its original form, rather than being encoded and captured before transmission. At the initiation point, knowledge should be transferred from tacit to explicit, namely externalized (Nonaka, 1994). The knowledge can then be communicated to the receiver of knowledge who internalizes it.

Codified organizational memory (Stein, 1995) is the channel through which knowledge can be transferred from the source to the receiver. The organizational memory channel is more formal than the socialization channel and requires some additional transmitting mechanisms for the knowledge. At the initiation point of this communication, channel knowledge is transmitted from the source and encoded into a formal knowledge base. Note that if the knowledge originates from a person, then it

may first have to be externalized and only then encoded into organizational memory. The knowledge is stored in the retainers of organizational memory until it is requested. Once requested, knowledge is retrieved and provided to the receiver who internalizes it.

2.4.2) Knowledge Functions

Nonaka defined four main functions of knowledge in his breakthrough paper in 1994.

Individual learning

'Individual learning' functions enable people to develop their knowledge by providing a learning environment. Specific information systems that facilitate individual learning can be e-learning systems or business intelligence systems that enable data mining and online processing of data.

Socialization

Socialization functions are functions that enable people to exchange knowledge with their co-workers, brainstorm on specific topics, or similar activities. Socialization functions are important for knowledge generation by enabling the brainstorming and discussions of problems and creating new knowledge between individuals, leading to the generation of organizational knowledge. They also support the transfer of knowledge through conversations and other communications.

Externalization / Retrieval

Externalization involves the transformation of knowledge from tacit to explicit. This transformation is important for knowledge transfer and for knowledge codification, which requires transferring tacit knowledge into explicit forms. A common language for communications should be provided for enhancing the

exchange of knowledge between groups and enabling the externalization of the knowledge.

Internalization / Storage

Internalization is the transformation of knowledge from explicit to tacit that is generally a personal process occurring within peoples' minds. To some extent Knowledge Management might support internalization by enhancing individual's learning capacity, the ability of individuals to recognize the value of new information, learn the new knowledge, and consequently apply it. This ability largely depends on the individual's prior knowledge (Cohen and Levinthal, 1990; Szulanski, 1996). An internalization functionality can therefore be the ability of the Knowledge Management to provide some additional information about the knowledge in memory in order to enhance the receiver's learning capacity.

3) KNOWLEDGE MANAGEMENT

Knowledge Management is a decision on the part of an organization to bring its staff together to help transform structured information into an intellectual asset. It is about exploiting people's intellectual capability.

3.1) Definition of Knowledge Management

In an era where supply has significantly risen over demand on most of products and services, the differentiation between various offerings is mainly limited to providing superior customer service, management's ability to learn faster than its competitors, capability to gather and distribute information and the effective use of knowledge. It is the way we manage knowledge that matters, rather than how we generate it.

Numerous pioneers have defined the concept of knowledge management, and outlaid its definitions:

Knowledge management involves the creation, evolution, exchange and application of new ideas into marketable goods and services for the success of an enterprise, the vitality of a nation's economy and the advancement of society (Amidon, 1997)

Knowledge assets are the knowledge regarding markets; products, technologies and organizations, that a business owns or needs to own and which enable its business processes to generate profits, add value, etc. ... Knowledge management involves the identification and analysis of available and required knowledge assets and knowledge asset related processes, and the subsequent planning and control of actions to develop both the assets and the processes so as to fulfill organizational objectives. (Macintosh *et al*., 1999)

KM caters to the critical issues of organizational adoption, survival, and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings. (Malhotra, 1998)

Knowledge management is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance. (O'Dell and Grayson, 1998)

Knowledge management is the formal management of knowledge for facilitating creation, access, and reuse of knowledge, typically using advanced technology. (O'Leary, 1999)

This thesis defines Knowledge Management as the set of activities that is designed to locate, share and foster knowledge throughout the company and its contacts in the outside world, in a way that enables the organization to give faster, and more sound responses to the environment. Knowledge Management is an analysis of the organization. This analysis includes intellectual assets, critical functions, potential bottlenecks and adds intelligence the decisions, processes and products of the organization.

3.2) Benefits of Knowledge Management

In the Delphi study Dfouini (2002) conducted amongst KM specialists, the following aspects were found to be the generally perceived benefits of KM.

Increase Internal Knowledge Sharing; The most important perceived benefit that organizations realize through KM is an internal increase in knowledge sharing. By cultivating a knowledge sharing culture, communication barriers tend to disappear, therefore allowing employees to more effectively and efficiently communicate and share knowledge.

Deliver Higher Quality Products and Services; Effectively using market and customer information to guide the development of products and services can substantially reduce the risk of new product development. Peter Murray (2002) believes that the optimum focus for knowledge management is competitiveness. To achieve and sustain this advantage and profitability, companies must offer something special to customers. Developing this, he says, requires a knowledge of customers and market trends, and an understanding of the organization's capabilities and how to capitalize on them. Because technology has leveled the field for competitors, so much so that quality and customer service have become the noun for all (Dykeman, 1998), it has become more difficult to offer something special to customers.

Increase Innovation; It is assumed that knowledge is one of the most powerful drivers of innovation. Therefore the key to success may rest in using knowledge as fuel for innovation - the only competitive advantage companies can sustain indefinitely (Hibbard, 1997). Nonaka (1998) also believes that the one sure source of lasting competitive advantage is knowledge. Brown (1998) states Innovation goes on at all levels of a company - wherever employees confront problems or work their way around breakdowns in normal procedures. Choo (2003)

has put forward a study on how KM can dramatically enhance new product development. The results of the study can be illustrated by the figures 3.1 and 3.2.

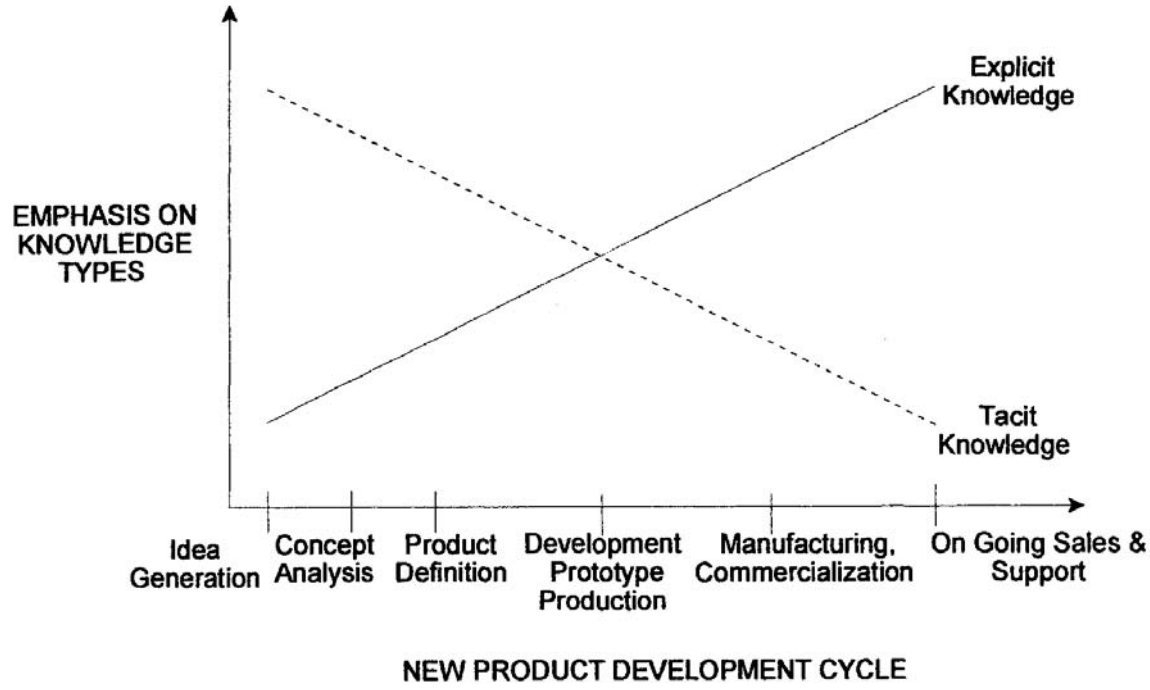

FIG 3.1 Emphasis of knowledge types on new product development (Choo, 2003)

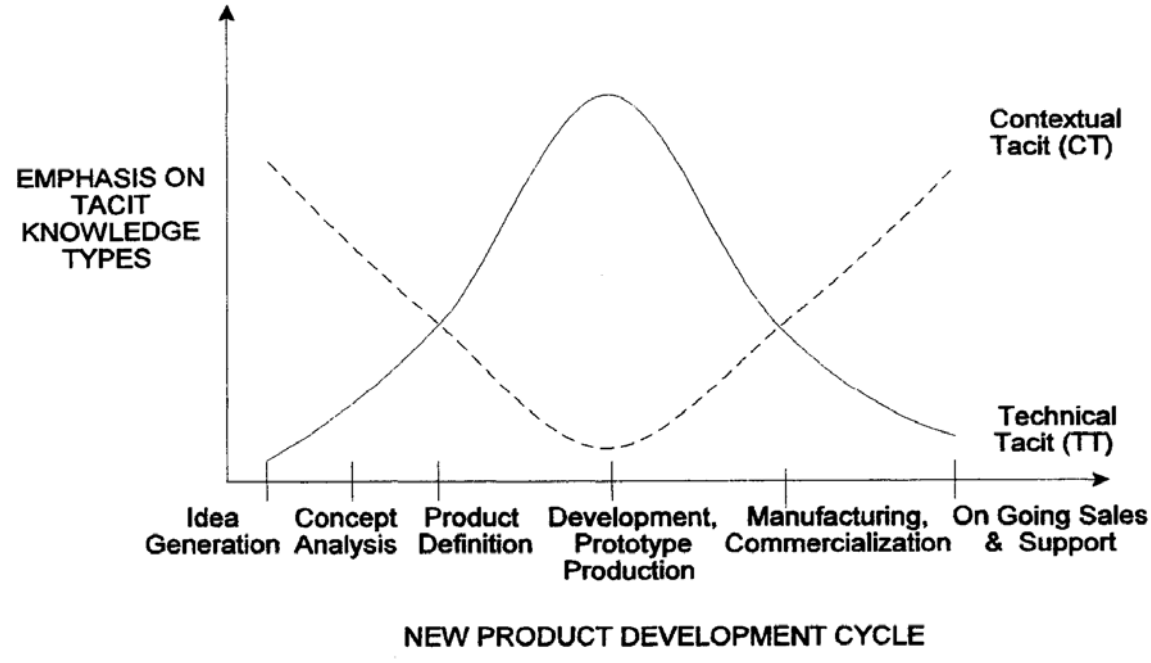

FIG 3.2 Tacit knowledge influence on new product development (Choo, 2003)

For example, Hewlett Packard maintains a large database of customer comments about products that enables the development engineers and product managers to use that information to help plan future products.(Choo, 2003)

Avoid Re-inventing the Wheel; The re-use of existing knowledge elements prevents recurring costs related to repeated research of the same topics, and repeated formulation of the same solutions.

Improve the Quality of Decision Making; A useful Knowledge Management initiative ensures that employees have the necessary access to required knowledge in a form that is advantageous to their decision making process. Laurence Prusak, worldwide competency leader in Knowledge Management at IBM, spent five years asking more than 80 firms: Where do you get the insight you need to run your business? The answer was almost always ad hoc, informal conversations with peers, employees, and trained experts such as consultants and lawyers. (Davenport *et al*., 1998).

Nonaka (1998) believes that the success of organizations depends on managing the creation of new knowledge. Doing this involves tapping the tacit and often highly subjective insights, intuitions, and hunches of individual employees, and on making those insights available for testing and use by the company as a whole. However, it is important to remember that not everyone having access to the same information and data is equally motivated, or qualified, to use these resources (Malhotra, 2001). The fact is that management often reaches decisions other than those indicated by available technology, information and knowledge. Davenport et *al*. (1998) have shown that despite the availability of comprehensive reports and databases, many executives often make decisions based simply on interactions with colleagues who they think are knowledgeable about the issues at hand.

Increase Collaboration between employees; By building communities of practice and encouraging informal social interactions, collaboration between employees is believed to increase. Knowledge Management's most valuable contribution lies in facilitating or implementing the sharing of best practices. Amoco Oil Company created the "Amoco Common Process," a framework for all its business processes to ensure that knowledge is transferred effectively among its business units and focuses primarily on the cultural change (Hibbard, 1997). This process shows how Amoco intends to get the sharing and use of knowledge to become instinctive in people. Such instinctive sharing has its drawbacks, however; Siemens AG determined that the ideal measure is whether a person had managed the process correctly and set the right limits on it (APQC, 2001). The implication is that employees are not only expected to share knowledge, but to do it efficiently and effectively. Furthermore, it is important to consider that what is shared is not necessarily warranted or valuable.

Build and Maintain a Competitive Advantage: Competitive advantage depends on the smartness with which knowledge is used throughout the organization. For example, a systems integration firm could reuse both methods and software, and thus achieve high productivity relative to competitors. Moreover, companies can also gain advantage by adding knowledge to their products and services. Peter Drucker (1998) believes that in an emerging economy, knowledge is the primary resource for individuals and for the economy overall. Malhotra (2001) states that land, labor, and capital- the economist's traditional factors of production - do not disappear, but they become secondary.

Turning to KM solutions can greatly enhance the performance of non strategic processes such as procurement as well. Peter Drucker (1998) believes that

the number of management levels and the number of management can be sharply cut when a company focuses its data-processing capacity on producing information in its organization structure. This is because whole layers of management neither make decisions nor lead, but function instead as 'relays' - human boosters for the faint, unfocused signals that pass for communication in the traditional pre-information organization.

Increase the Effective Utilization of Knowledge Resources; As a knowledge base is used over time, continuous feedback from its users helps the system improve relevance, identify new and improved solutions, and establish the applicability of known solutions to all related problems. This increases the value and usability of the knowledge in the knowledge base. Collective feedback from the system also helps the distinguishing of quality inputs and information, enabling prime solutions to be located and accesses more easily. Some believe that Knowledge Management in itself is the art of creating value from intangible assets (Sveiby, 2001). Quinn *et al*. (1998) state that, in the postindustrial era, the success of a corporation lies more in its intellectual and systems capabilities than in its physical assets because professional intellect creates most of the value in the new economy and these intellectual assets increase in value with use.

Increase Employee Productivity; Using knowledge effectively to leverage employee productivity and operational effectiveness can benefit the organization. A good example would be “Best Practices”. Hatten and Rosenthal (2001) believe that Knowledge Management is also a way that an organization can uncover exactly what it does best, and to apply capital and management assets more effectively while creating a stronger competitive position for the whole enterprise by drawing on the strengths of others. Within efficient KM organizations, leaders and decision-makers

focus on serving a targeted set of customers from a more advantaged position, delivering products and services with reduced asset commitments.

Retain Intellectual Capital when Employees Leave the Organization; Many organizations have found that the lack of opportunities for personal growth and minimal rewards for collaborative efforts lead to employee loss. Clearly, knowledge leaders should prioritize cultural transformation efforts to reduce the loss of knowledge by helping retain employees.

4) KNOWLEDGE MANAGEMENT TOOLS

Chen (2001) has proposed a conceptual model of Knowledge Management viewed from four general perspectives: Consulting perspective, Technology Foundation perspective, Content Management / Information Sciences perspective, and a Knowledge Management System perspective

4.1) Four Perspectives to Knowledge Management Tools

Chen (2001) believes that consultants often take a process perspective, stressing best practices, process modeling, learning/education paradigms, human resources, culture and rewards, and systematic methodologies.

Their implementations, however, often adopt knowledge management methodologies based on existing and proven technical foundations such as data warehousing, email, e-portals, document management systems and search engines.

Henry Baltazar (2002), argued that a typical KM solution consists of four elements: a portal-based interface, a document management system, a search engine and collaboration tools. A successful KM implementation, he believes, is a tight integration of these elements. Based on these comments, it may be argued that the difference between a consultant perspective and one built on technology is that the former concerns itself with human processes and practices in an organization, while the latter is a matter of the implementing and exploiting tools and resources such as databases, information portals and e-mail.

The third perspective, exemplified by experts trained in information or library sciences, stresses content management and system usability, one in which knowledge is represented as taxonomies, knowledge map, or ontology as created and maintained by information specialists (Chen, 2001). Essentials include defining a content lifecycle, gathering an inventory of existing content, identifying the taxonomy to be

used during classification, and outlining who is responsible for updating the content. Jan Duffy (2001) believes that a convergence of content management, document management and portals is warranted in order to provide employees with the knowledge they require.

Chen's (2001) fourth perspective incorporates the Knowledge Management System approach. This approach applies KM by codifying and extracting knowledge using automated, algorithmic, and data-driven techniques, focusing on analysis by new and highly sophisticated classes of software systems.

Successfully implementing Knowledge Management requires that each of these four perspectives be considered and addressed separately.

4.2) Description Knowledge Management Tools

From the research of current literature it is possible to group the KM tools into seven specific categories.

Portals (Internet/Intranet/Extranet):

Company web pages and interactive portals have the potential to foster knowledge sharing and learning. The Intranet is simply an Internet technology used within an organization, with restricted access to its content from outside.

The Intranet is a relatively simple way to allow users access to a company-wide knowledge center. One step beyond the Intranet is the Extranet, which is an intranet that extends to business associates such as suppliers or customers.

Information Retrieval Engines:

Portals would be unusable without information retrieval engines. Information retrieval engines are considered to be the center of information businesses. This definition mainly includes searching e-mail archives, printed reference sources,

online sources, CD-ROM and Internet databases. To maintain high-quality control in information production and services, the speed of retrieval, the accuracy of retrieved information, and the cost of searching an enormous scale of information field must be strategically planned and tactically coordinated.

At the minimum, retrieval engines should search across structured and unstructured data in all formats. It should perform relevance ranking as a default, but be able to re-rank by other parameters, such as date, topic, or author. It should provide both browsing and search capabilities, and be able to explore by concepts, rather than by words. This last ability is particularly valuable because so many terms are synonymous.

Document Management Systems:

In many organizations, knowledge is embedded in documents. Duffy (2001) defines a document management system as one that represents the convergence of full-text retrieval and publishing applications. It supports the unstructured data management requirements of KM initiatives through a process that involves capture, storage, access, selection, and document publication.

In addition, document management systems can be integrated with other technologies, such as workflow, to direct the documents to different individuals as defined by their workflow. Also, document management allows information to be organized as fully linked corporate documents for publishing to intranets and extranets, Web servers, or the electronic document repository.

Corporate Yellow Pages of Skills and Expertise:

In many companies, employees waste time re-researching topics or making decisions that are not based on the company's best thinking. Corporate yellow pages of skills and expertise help to store and distribute knowledge about the skills and

areas of expertise of the organization's staff. Its objective is to allow people in the organization to efficiently and effectively find colleagues with adequate skills and/or expertise. It should allow queries by taxonomy of area and return a list of experts ranked by experience. An important aspect of this tool is the ability to include pre-defined rules. This ensures and enables that particular experts can always be identified, or stay discrete.

Knowledge Maps:

Duffy (2000) defines a knowledge map as the navigational system that enables users to find the answers they seek. It is the primary means of representing the entire collection of knowledge objects, regardless of category or location, and helps to identify the links between existing islands of information. Knowledge maps are designed to help people in the organization know where to go to find what they need to know, whether the destination be a person, place, or thing.

Another use of knowledge maps is to chart the knowledge flows within a process, from acquisition, through development, storage, and internal & external deployment. Such maps should not try to incorporate all possible knowledge, but rather should focus on the key issues which need to be addressed to produce bottom line results. Gartner Group suggests that a best practice for optimal creation of the essential knowledge map is to manually build a high-level structure, guided by enterprise usage and consistent rules or principles, and then use that framework to enable the subsequent classification task to be done through automated means. (Rosser *et al.*, 1999) Chrysler stores ideas and lessons learned for new car development in its "Engineering Books of Knowledge", which are actually computer files that store knowledge gained by automobile platform teams. (Clarke, 2000)

Discussion Boards and E-mail Groups:

Discussion boards and E-mail Groups aim to support conversations among communities of interest. These groups are often very large with multiple topics. The focus of these systems is almost exclusively on conversational interactions, though in most cases this is augmented with chat capabilities, presence awareness, and instant messaging.

Discussion boards lack good document storage and search facilities for uploaded files, but they are usually relatively inexpensive. Some companies are starting to add features to their system in order to address a broader spectrum of community needs, including reputation of members and connections to knowledge bases. When the company's business strategy moves in such a direction, the system is increasingly able to serve communities of practice.

E-Learning Technologies:

Another way to share knowledge across an organization is through structured online learning events. Nevo (2001) states, by helping to create shared common language, and providing around the clock access to information that aligns with culture and with business objectives, e-learning helps support knowledge driven environments that enhance employee empowerment, self-directed learning at all levels, collaborative discovery, and a sense of community. Learners gradually develop and adopt new perspectives over time that result in changed behaviors, attitudes and self-concept. Many organizations begin KM initiatives by creating and storing knowledge in repositories. E-learning can provide support through learning portals that house various types of employee data, such as training records, white papers, press releases, "lessons learned" and discussion databases, as well as web-based courses.

5) A SURVEY FOR DEFINING PRIORITIES OF KNOWLEDGE MANAGEMENT TOOLS IN TURKEY

The aim of this dissertation was to conduct a survey among local professionals in order to determine the priority ranking of the above mentioned Knowledge Management Tools.

5.1) Survey Design

During our survey design we set forth a few main principles to abide by.

- The survey should not be more than 10 pages
- The questions should provide basic information about the tool in discussion
- The questions should bear no technical jargon
- The questions should be grouped into clusters of similar relevance
- A five point scale will be applied to the questions in order to determine how strongly participants feel about the weight of questions

The biggest drawback this survey faced was the fact that the concept of Knowledge Management was previously unheard by most of the participants. Brief descriptions of the tools within the questions, as well as a few major advantages and disadvantages of the relevant application were also included in the questions. The survey's intention was to measure the participant's perceptions of these tool's implementations based on their usage of similar tools beforehand.

Intense care was taken to confine these supplementary remarks to objective and equal standards. Had these remarks not been added, the survey would face the possibility of being a positively biased survey, resulting from participants replying in favor of positive concepts of KM before weighing up the advantages and disadvantages thoroughly.

5.2) Survey Probe

The first three questions were aimed at using web portals to link employees with the environment. It was needed to know the ways employees reacted to sharing inner knowledge of organization, flow and contacts with the outside world.

The fourth question concentrated on intranet portals and added a lot of depth to contact publishing by including more detailed information about the person, the position and the specialty.

Questions five, six and seven tried to probe response to electronic forums. Question eighth and nine focused on e-mail depository systems

Question ten explored responses to document management system and knowledge maps.

Question eleven tried the measure the amount of backing for setting up e-mail groups. Twelfth question was designed to probe company wide expertise yellow pages.

Thirteenth question tried to measure if the participants weighed targeted e-learning solutions more than the outsourced company wide training packages.

Question fourteen focused on data mining via detailed customer bases and finally question fifteenth tackled whether or not an anonymous feedback mechanism in the form of a discussion board could improve the company.

The questionnaire was applied first on two IT specialists who had been very actively using some of these tools already. The responses that we had collected were very positive.

Consequently the survey was taken to two knowledge management experts for their validation. A copy of the survey can be found in Appendix A.

5.3) Demographic View of Participating Companies

Our survey was conducted among 15 companies and 35 professionals. 28% of the participants were working in manufacturing organizations. 14% of the participants were from FMCG companies and the third highest contributor was the IT sector. A pie graph of the participants can be found in Fig 5.1.

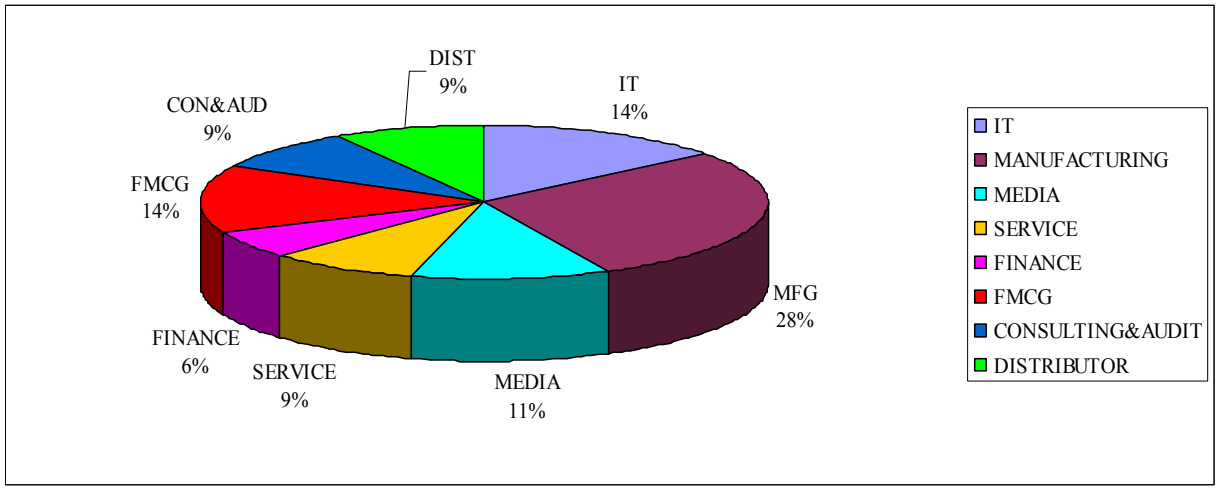

FIG 5.1 The sector distribution of participating companies

Ownership of most of the participant companies were local, however there were a few exceptional 100% foreign investment and Foreign-Local joint venture firms on the survey portfolio. The ownership structure of the participating companies is shown in Fig. 5.2.

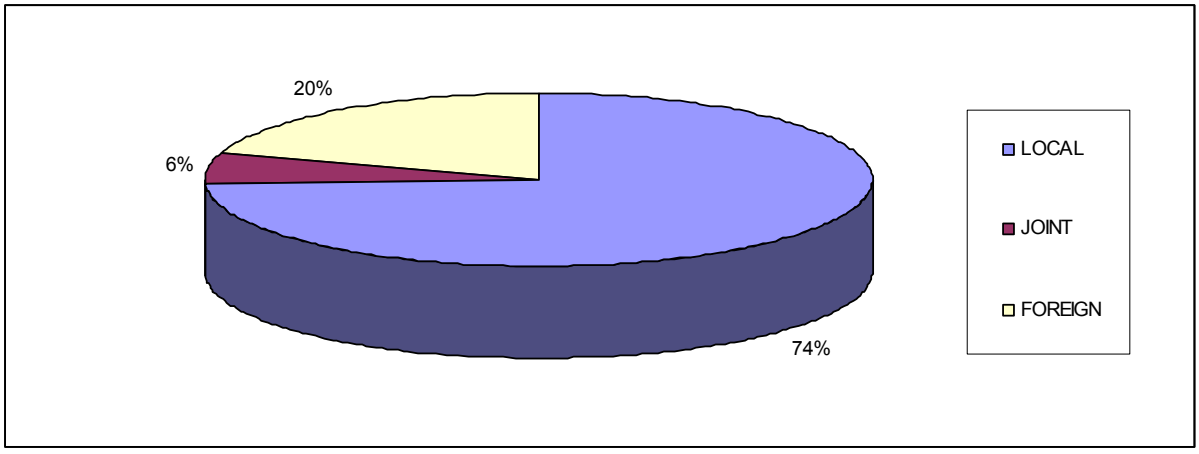

FIG 5.2 The ownership structure of participating companies

The size of the companies ranged from small scale consulting firms to international FMCG giants. The employee count was ranging from 11 to 2500 employees among the participating companies, and it is shown with a pie chart in Fig. 5.3.

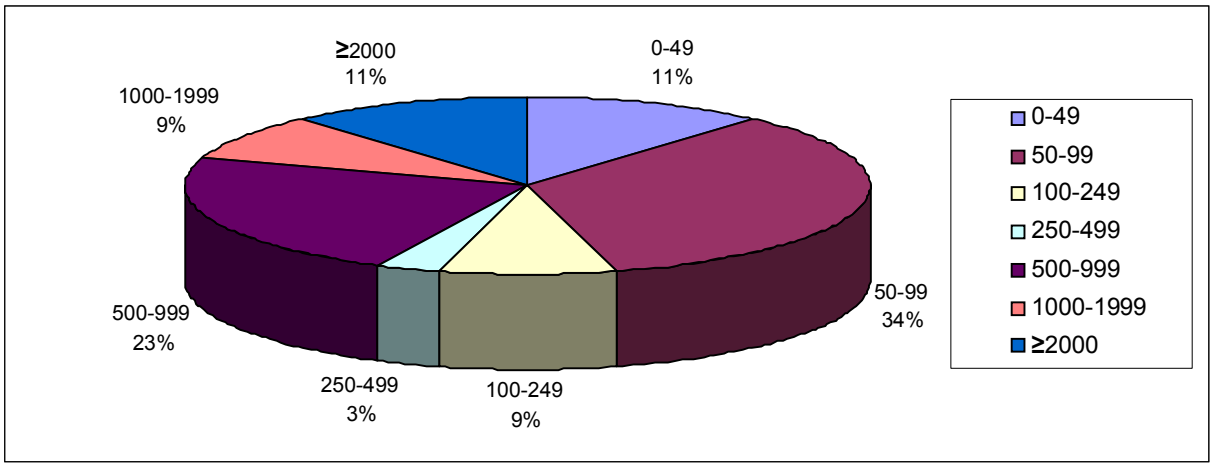

FIG 5.3 The employee count of participating companies

5.4) Statistical Analysis of Survey

The mean and the standard deviation was calculated and the results can be found below in Table 5.1 and Table 5.2.

Table 5.1The Mean and Standard Deviation of Results

Question	Mean	Std. Dev.	Cases
QUESTION01	2.6857	1.1054	35
QUESTION02	2.6286	1.3522	35
QUESTION03	1.6571	1.1099	35
QUESTION04	3.0286	1.2945	35
QUESTION05	4.2857	0.6674	35
QUESTION06	2.1143	1.3454	35
QUESTION07	3.1714	1.1501	35
QUESTION08	4.2857	1.0167	35
QUESTION09	3.0571	1.3272	35
QUESTION10	4.1429	0.8096	35
QUESTION11	4.0571	1.0274	35
QUESTION12	3.6571	1.2113	35
QUESTION13	2.8	0.8331	35
QUESTION14	4.1714	0.822	35
QUESTION15	3.4	1.0059	35

Table 5.2 Reliability Analysis

Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
QUESTION01	46.4571	42.9613	0.268	0.5573	0.6591
QUESTION02	46.5143	38.316	0.4733	0.5394	0.6255
QUESTION03	47.4857	43.9042	0.1993	0.5862	0.6683
QUESTION04	46.1143	42.8101	0.2114	0.3522	0.669
QUESTION05	44.8571	45.0084	0.2919	0.5414	0.6595
QUESTION06	47.0286	42.558	0.2107	0.4247	0.67
QUESTION07	45.9714	40.8521	0.4008	0.5517	0.6402
QUESTION08	44.8571	44.7731	0.1661	0.5756	0.6715
QUESTION09	46.0857	40.0218	0.3742	0.6343	0.6429
QUESTION10	45	42.8235	0.433	0.571	0.6435
QUESTION11	45.0857	43.4924	0.2597	0.4946	0.6601
QUESTION12	45.4857	41.963	0.2955	0.417	0.6554
QUESTION13	46.3429	44.0555	0.3	0.5327	0.6566
QUESTION14	44.9714	44.205	0.2915	0.4624	0.6575
QUESTION15	45.7429	45.0202	0.1508	0.4488	0.6732

The “Crombach’s Alpha Coefficient” is 0.6726 and the “Standardized Item Alpha” is 0.6816.

5.5) Survey Results

The survey results are given in Table 5.3. For simple discussion, the mean weight of responses for each question has been stated as well.

A paired t-test is conducted in order to test if the differences in the use of the tools are statistically significant. The questions are grouped according to the tools, and the mean value for each tool is calculated as shown in Table 5.4. To give a general idea, paired sample statistics are shown in Table 5.5.

Table 5.3 Survey Results

		QUESTIONS														
PARTICIPANTS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1	1	2	1	4	4	3	3	4	4	4	5	3	3	5	3
	2	4	5	1	2	5	5	4	4	5	5	5	5	5	5	4
	3	4	3	1	4	5	1	4	5	5	5	5	5	2	5	4
	4	3	3	2	2	4	4	4	5	3	4	4	3	3	4	4
	5	3	3	1	3	4	4	3	4	4	4	4	3	3	4	3
	6	3	5	2	4	4	1	3	5	2	5	4	2	2	4	3
	7	3	2	1	4	4	1	2	5	1	4	2	4	3	5	1
	8	4	4	1	4	5	3	1	4	2	4	4	3	4	5	4
	9	4	3	3	4	4	1	2	5	5	5	5	4	3	4	3
	10	4	5	1	5	5	1	5	5	5	5	5	3	3	5	4
	11	1	3	1	1	4	1	4	5	5	4	5	3	3	4	3
	12	4	1	1	3	4	3	4	3	3	5	1	3	2	5	3
	13	3	1	1	4	4	1	3	5	4	3	3	3	1	3	4
	14	2	1	1	1	4	2	2	5	1	2	5	1	3	5	3
	15	1	1	1	4	5	5	5	5	5	5	5	5	2	5	3
	16	3	2	2	4	5	3	3	4	2	4	4	3	3	4	3
	17	4	1	1	1	5	1	2	1	1	4	3	4	3	5	4
	18	3	2	2	3	5	1	2	4	4	5	3	4	3	4	5
	19	3	3	5	1	4	1	4	5	4	5	3	4	3	4	4
	20	3	1	2	3	5	1	3	4	2	4	5	5	2	3	5
	21	3	5	3	3	5	1	3	5	2	4	4	5	3	4	2
	22	1	3	1	1	4	2	3	2	2	4	4	5	3	4	5
	23	1	2	1	4	4	1	1	5	1	4	5	5	2	4	4
	24	3	4	5	5	4	3	4	5	2	5	5	5	5	4	4
	25	3	3	1	4	2	1	1	2	3	4	5	5	2	4	2
	26	1	1	1	2	4	2	4	5	3	4	4	5	3	5	1
	27	2	2	1	1	5	5	5	5	5	4	5	3	2	5	4
	28	1	1	1	1	4	1	1	5	3	5	3	1	3	2	2
	29	4	3	2	3	4	4	4	4	3	4	4	3	3	4	3
	30	2	3	2	3	5	3	3	5	2	4	4	4	3	5	3
	31	3	1	1	5	4	2	4	4	4	3	5	4	2	4	3
	32	2	4	1	4	5	1	3	4	3	5	4	3	4	3	5
	33	3	4	4	3	3	1	4	5	3	3	4	5	2	4	4
	34	4	4	1	4	4	2	4	3	2	4	2	4	3	4	3
	35	1	1	2	2	4	2	4	4	2	2	4	1	2	2	4
AVG		2.69	2.63	1.66	3.03	4.29	2.11	3.17	4.29	3.06	4.14	4.06	3.66	2.80	4.17	3.40
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 5.4 Survey Results Grouped by Tools

		TOOLS							
		Tool_A	Tool_B	Tool_C	Tool_D	Tool_E	Tool_F	Tool_G	Tool_H
PARTICIPANTS		Mean 1-4	Mean 5,6,7,15	Mean 8,9	10	11	12	13	14
	1	2,00	3,25	4,00	4,00	5,00	3,00	3,00	5,00
	2	3,00	4,50	4,50	5,00	5,00	5,00	5,00	5,00
	3	3,00	3,50	5,00	5,00	5,00	5,00	2,00	5,00
	4	2,50	4,00	4,00	4,00	4,00	3,00	3,00	4,00
	5	2,50	3,50	4,00	4,00	4,00	3,00	3,00	4,00
	6	3,50	2,75	3,50	5,00	4,00	2,00	2,00	4,00
	7	2,50	2,00	3,00	4,00	2,00	4,00	3,00	5,00
	8	3,25	3,25	3,00	4,00	4,00	3,00	4,00	5,00
	9	3,50	2,50	5,00	5,00	5,00	4,00	3,00	4,00
	10	3,75	3,75	5,00	5,00	5,00	3,00	3,00	5,00
	11	1,50	3,00	5,00	4,00	5,00	3,00	3,00	4,00
	12	2,25	3,50	3,00	5,00	1,00	3,00	2,00	5,00
	13	2,25	3,00	4,50	3,00	3,00	3,00	1,00	3,00
	14	1,25	2,75	3,00	2,00	5,00	1,00	3,00	5,00
	15	1,75	4,50	5,00	5,00	5,00	5,00	2,00	5,00
	16	2,75	3,50	3,00	4,00	4,00	3,00	3,00	4,00
	17	1,75	3,00	1,00	4,00	3,00	4,00	3,00	5,00
	18	2,50	3,25	4,00	5,00	3,00	4,00	3,00	4,00
	19	3,00	3,25	4,50	5,00	3,00	4,00	3,00	4,00
	20	2,25	3,50	3,00	4,00	5,00	5,00	2,00	3,00
	21	3,50	2,75	3,50	4,00	4,00	5,00	3,00	4,00
	22	1,50	3,50	2,00	4,00	4,00	5,00	3,00	4,00
	23	2,00	2,50	3,00	4,00	5,00	5,00	2,00	4,00
	24	4,25	3,75	3,50	5,00	5,00	5,00	5,00	4,00
	25	2,75	1,50	2,50	4,00	5,00	5,00	2,00	4,00
	26	1,25	2,75	4,00	4,00	4,00	5,00	3,00	5,00
	27	1,50	4,75	5,00	4,00	5,00	3,00	2,00	5,00
	28	1,00	2,00	4,00	5,00	3,00	1,00	3,00	2,00
	29	3,00	3,75	3,50	4,00	4,00	3,00	3,00	4,00
	30	2,50	3,50	3,50	4,00	4,00	4,00	3,00	5,00
	31	2,50	3,25	4,00	3,00	5,00	4,00	2,00	4,00
	32	2,75	3,50	3,50	5,00	4,00	3,00	4,00	3,00
	33	3,50	3,00	4,00	3,00	4,00	5,00	2,00	4,00
	34	3,25	3,25	2,50	4,00	2,00	4,00	3,00	4,00
	35	1,50	3,50	3,00	2,00	4,00	1,00	2,00	2,00

Table 5.5 Table of Paired Samples Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_B	324,2857	35	68,1924	11,5266
Pair 2	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_C	367,1429	35	93,8889	15,8701
Pair 3	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_D	414,2857	35	80,9606	13,6848
Pair 4	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_E	405,7143	35	102,7357	17,3655
Pair 5	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_F	365,7143	35	121,1291	20,4746
Pair 6	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 7	TOOL_A	250,0000	35	80,6682	13,6354
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 8	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_C	367,1429	35	93,8889	15,8701
Pair 9	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_D	414,2857	35	80,9606	13,6848
Pair 10	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_E	405,7143	35	102,7357	17,3655
Pair 11	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_F	365,7143	35	121,1291	20,4746
Pair 12	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 13	TOOL_B	324,2857	35	68,1924	11,5266
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 14	TOOL_C	367,1429	35	93,8889	15,8701
	TOOL_D	414,2857	35	80,9606	13,6848
Pair 15	TOOL_C	367,1429	35	93,8889	15,8701
	TOOL_E	405,7143	35	102,7357	17,3655
Pair 16	TOOL_C	367,1429	35	93,8889	15,8701
	TOOL_F	365,7143	35	121,1291	20,4746
Pair 17	TOOL_C	367,1429	35	93,8889	15,8701
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 18	TOOL_C	367,1429	35	93,8889	15,8701
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 19	TOOL_D	414,2857	35	80,9606	13,6848
	TOOL_E	405,7143	35	102,7357	17,3655
Pair 20	TOOL_D	414,2857	35	80,9606	13,6848
	TOOL_F	365,7143	35	121,1291	20,4746
Pair 21	TOOL_D	414,2857	35	80,9606	13,6848
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 22	TOOL_D	414,2857	35	80,9606	13,6848
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 23	TOOL_E	405,7143	35	102,7357	17,3655
	TOOL_F	365,7143	35	121,1291	20,4746
Pair 24	TOOL_E	405,7143	35	102,7357	17,3655
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 25	TOOL_E	405,7143	35	102,7357	17,3655
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 26	TOOL_F	365,7143	35	121,1291	20,4746
	TOOL_G	280,0000	35	83,3137	14,0826
Pair 27	TOOL_F	365,7143	35	121,1291	20,4746
	TOOL_H	417,1429	35	82,1967	13,8938
Pair 28	TOOL_G	280,0000	35	83,3137	14,0826
	TOOL_H	417,1429	35	82,1967	13,8938

The significance level is defined as 5%, i.e., if the significance level for any two tools is less than 0.05, then the difference between the usage levels of these two tools are considered statistically significant. Table 5.6 summarizes the results of paired samples t-test.

Table 5.6 Table of Paired Samples Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	TOOL_A - TOOL_B	-74,2857	102,4490	17,3170	-109,4782	-39,0933	-4,290	34	,000
Pair 2	TOOL_A - TOOL_C	-117,1429	116,1217	19,6281	-157,0320	-77,2537	-5,968	34	,000
Pair 3	TOOL_A - TOOL_D	-164,2857	91,4117	15,4514	-195,6867	-132,8847	-10,632	34	,000
Pair 4	TOOL_A - TOOL_E	-155,7143	127,7759	21,5981	-199,6068	-111,8217	-7,210	34	,000
Pair 5	TOOL_A - TOOL_F	-115,7143	122,4874	20,7041	-157,7902	-73,6384	-5,589	34	,000
Pair 6	TOOL_A - TOOL_G	-30,0000	96,5965	16,3278	-63,1821	3,1821	-1,837	34	,075
Pair 7	TOOL_A - TOOL_H	-167,1429	108,5959	18,3561	-204,4469	-129,8389	-9,106	34	,000
Pair 8	TOOL_B - TOOL_C	-42,8571	96,5530	16,3204	-76,0243	-9,6900	-2,626	34	,013
Pair 9	TOOL_B - TOOL_D	-90,0000	97,8068	16,5324	-123,5978	-56,4022	-5,444	34	,000
Pair 10	TOOL_B - TOOL_E	-81,4286	110,7034	18,7123	-119,4565	-43,4006	-4,352	34	,000
Pair 11	TOOL_B - TOOL_F	-41,4286	135,4381	22,8932	-87,9532	5,0961	-1,810	34	,079
Pair 12	TOOL_B - TOOL_G	44,2857	97,0305	16,4011	10,9546	77,6169	2,700	34	,011
Pair 13	TOOL_B - TOOL_H	-92,8571	93,4572	15,7971	-124,9608	-60,7535	-5,878	34	,000
Pair 14	TOOL_C - TOOL_D	-47,1429	104,2782	17,6262	-82,9637	-11,3220	-2,675	34	,011
Pair 15	TOOL_C - TOOL_E	-38,5714	110,5373	18,6842	-76,5423	-,6005	-2,064	34	,047
Pair 16	TOOL_C - TOOL_F	1,4286	154,1035	26,0483	-51,5078	54,3650	,055	34	,957
Pair 17	TOOL_C - TOOL_G	87,1429	129,6732	21,9188	42,5986	131,6871	3,976	34	,000
Pair 18	TOOL_C - TOOL_H	-50,0000	120,0490	20,2920	-91,2383	-8,7617	-2,464	34	,019
Pair 19	TOOL_D - TOOL_E	8,5714	135,8447	22,9619	-38,0929	55,2357	,373	34	,711
Pair 20	TOOL_D - TOOL_F	48,5714	124,5496	21,0527	5,7871	91,3557	2,307	34	,027
Pair 21	TOOL_D - TOOL_G	134,2857	93,7546	15,8474	102,0799	166,4915	8,474	34	,000
Pair 22	TOOL_D - TOOL_H	-2,8571	104,2782	17,6262	-38,6780	32,9637	-,162	34	,872
Pair 23	TOOL_E - TOOL_F	40,0000	143,8954	24,3228	-9,4298	89,4298	1,645	34	,109
Pair 24	TOOL_E - TOOL_G	125,7143	126,8228	21,4370	82,1491	169,2795	5,864	34	,000
Pair 25	TOOL_E - TOOL_H	-11,4286	125,4906	21,2118	-54,5361	31,6790	-,539	34	,594
Pair 26	TOOL_F - TOOL_G	85,7143	141,7181	23,9547	37,0324	134,3962	3,578	34	,001
Pair 27	TOOL_F - TOOL_H	-51,4286	122,1653	20,6497	-93,3938	-9,4633	-2,491	34	,018
Pair 28	TOOL_G - TOOL_H	-137,1429	105,9570	17,9100	-173,5404	-100,7453	-7,657	34	,000

Tool_A which was a combined effort of portals and knowledge maps, was considered less important by our participants against all other KM tools. However the analysis we have conducted shows that when compared to Tool_G which was E-learning systems, the positive difference in favor of E-learning systems is not statistically significant.

Tool_B was considered less important by our participants against the other KM tools except in respect to Tool_A and Tool_G. Tool_G was E-Learning.

However Tool_F's (Yellow pages of skills and expertise) preference over Tool_B was proven to be instatistically significant by our test.

Tool_D, Tool_E and Tool_H were favored more than Tool_C and these preference proved to be statistically significant. Tool_C was favoured over Tool_G and Tool_F however our tests showed Tool_C's preference over Tool_F could not be considered statistically significant.

Tool_E was more favored than Tool_F, Tool_G and Tool_H however the preference of Tool_E over Tool_F cannot be considered statistically significant.

Tool_F was preferred over Tool_G however it was less in favor against Tool_H. Both of the tendencies proved to be statistically significant.

Tool_H was preferred over Tool_G and the tests showed that this preference is indeed statistically significant.

The priorities of the Knowledge Management Tools in the following discussion section were determined in accordance with the statistical analysis in this chapter.

5.6) Discussion of Survey Results; Defining the Priorities

The first three questions took on the aspect of portals and tried to determine how the professionals were reacting to enhancing the relations between the company workforce environment.

It is a common Intellectual Capital Measurement tool to probe a company's website in order to find information about the actual people and the positions they serve in a company. Contact details of such are also very important to determine how customer friendly the business is. Publishing employee contacts and an organization chart can be a very effective way of being in sync with the customers.

The first question simply asked if the website publication of organization chart and personal contacts would be considered appropriate. The average response to this question was 2.69, evaluating this simple step as the least prioritized of KM suggestions.

Since successful customer relations management has been a widely accepted concept, it must be stated that the negative approach to this question had been unexpected. Thinking of the potential benefits such as cutting down bureaucracy, more efficient and direct interactions with surrounding environment and more customer oriented business approach, a much higher mean for this question was expected.

Some of the participants were worried about showcasing their elite workforce and making them an easy prey for the headhunters and competitors. Other participants had worries about the spam e-mail and tele-marketing traffic since this might bring down the individuals.

The fact that this kind of information might lead to individuals getting in touch with the wrong contacts far too often, therefore increasing the unnecessary workload, was a factor we had anticipated. Another cause for a negative leniency could also be stated as the stubborn nature of Turkish business environment. The customers could use this information and try to reach different divisions or management levels to get what they wanted, be it a special price, or an allocation or a payment term. Customers who reach the internal mechanism of the company could try to force the procedures in their favor by applying pressure to related employees. At the process of doing so they are bound to contact a lot of employees who have nothing to do with their problem, “a different mode of spam” as we might define this.

To bring a partial solution to this anticipated problem the second question was devised with the inquiry “How would you feel about leaving the management level employees out of this publication?”

With this question the participants’ leniency on whether to publish low level contacts and keep the management level out of sight was being measured. Applying this restriction would avoid bypassing efforts but at the same time it would disable an important extent of the usage of the tool in discussion. Here it must be stated that this restriction would be only effective for vertical interventions, meaning it would only block the way to upper management. There would always be the divisional bypassing to consider, such as forcing different results from marketing and sales departments, but these kinds of efforts are easier to avoid and less harmless.

The average response to this question was slightly more negative than the first one, which again was in grave contradiction with our anticipation.

One of the managerial level participants pointed a local cultural problem, the eagerness of the customers to try to be in touch with the highest level of person they can get. Especially in areas like advertising, the big budgets bring in the presence of high level officials in the customer companies and they request to be assisted by similar manager level contacts. Reaching this level easily was the driving force for instating this restriction.

When devising KM implementations, it is crucial to sustain management support. It is a must to design systems, which do not significantly increase the workload on the employees, especially managers. Keeping these two factors in mind it is also needed to make sure that the right inquiries are channeled through the right contact and they are answered in a timely fashion.

When evaluating this restriction the initial concern was the particular incidents in which a customer reaches a less experienced contact which might prioritize the customer request in a wrong level, therefore causing the company to miss out an important chance of business or market feedback. Another potential setback related to this is the increased amount of bureaucracy. With entry level contacts forwarding the issues to managers, another level of bureaucracy is being mounted on the system which is bound to cripple company's response to market conditions.

According to the percentage of the participants' answers it is sufficient to say that these stated setbacks have found wider recognition than the proposed uses of this restriction. It is also perceived the general preference for the equal amount of exposure to this KM tool from the participants regarding all levels of their organization, it is a clear outcome that the employees, regardless of their sector, believe that this KM initiative has to be a company wide and equal implementation.

The negative outcome of the first two questions has added to the importance of the third question, "Which would you prefer, departmental contact publishing or personal contact publishing?"

The main reason for the inclusion of this question was to test the general approach to contact publishing, in the most anonymous and restricted fashion. The survey was trying to determine an alternative to our implementation suggestions in the first two questions.

Considering the negative feedback that had been received from the first two questions, it was anticipated to see that most of the participants favored departmental contact publishing in this question and the results were in accordance with the expectations.

The advantages of departmental contact publishing, such as the ease of update, keeping a steady continuous flow was favored over the advantages of contact publishing, which had the advantages of addressing a particular employee and issuing a greater sense of responsibility and quicker return. The most important advantage of contact publishing, the possibility of providing broader information about the employee's particular function or specialty, which we had thought as a key factor, was not enough to tip the balance to this method.

It was stated by some participants that the departmental contact mail should be in close monitoring of a manager, ensuring the swift channeling of the request to the most optimal worker. The optimal criteria may depend on the amount of work that has been piled up in front of the particular an employee, or it may depend on a specialty of the employee, such as specific assignment over a specific sector or product specific information. If this kind of monitoring is not established, it is a very strong possibility that the inquiries received through this channel will be left unattended for a long time. This preference reflects the Turkish business environment's approach to cutting down bureaucracy, the participants cared less about greater interaction with the environment and chose the shield of an anonymous e-mail or a secretary, over speed and efficiency.

In this survey's quest for defining the optimum format of publishing employee contacts on the web, exploring one final possibility was required. That was publishing the contacts in an extranet page, which had been directed to the participants as the fourth question.

An extranet is a private network that uses internet protocols, network connectivity, and possibly the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners,

customers or other businesses. An extranet can be viewed as part of a company's intranet that is extended to users outside the company. The survey was trying to define the best method in order to notify the customers of how this organization works, what kind of capabilities it has, trying to show partners and customer some sort of transparency and enable much efficient communication. Extranet was a last resort for establishing this goal.

The average response given to this question was much more positive. Most of the participants felt this would be a feasible tool to employ, even though they did not prioritize it strongly.

The anticipated potential setback, in the form of a customer reaching different departments and receiving contradictory information was not a major cause of worry. The lack of transparency helps to maintain the human errors in the company processes discrete and keep the customer content. Causes such as extremely long logistics lead-times, that are found frequently in manufacturing giants, might surface on the customer side and create dissatisfaction.

However most of the participants valued the advantages of increased reaction speed, direct contact resolutions and less bureaucracy in this question.

Extrapolating from this factor it can be deducted that among Turkish professionals, keeping the existent customer portfolio ranks higher than enhancing new customer base. The benefits of a login required publication might filter a lot of unnecessary communication traffic and this has probably made the scale tip in favor of this format.

Although it has been conceived as a widely recognized application, the different opinions and outcomes from these first four questions define how our business culture perceives the most basic of KM tools. A rather simple tool, aimed at

opening the internal structure to outside world and therefore opting for a more efficient interaction, can create a very intriguing result. Turkish business culture is still distant from the idea of intellectual capital. Most of the procedures in place focus on keeping bureaucracy in tact, keeping the workforce under the formation of orthodox ranks.

A way to flexing these ranks could lie in increasing the collaboration between employees. Re-inventing the wheel, applying previously devised solutions, bringing new comers up to speed are all classic mottos of knowledge management. A rather widely recognized tool is establishing a company wide electronic forum where the employees can log on and place their questions and comments on a web page. With each employee adding his/her contribution to this network, it might be possible to capture at least the basics of successful functions in the company.

The fifth question focused on this tool and tried to evaluate the participants view to this KM tool. The average of 4.29 made it evident that most of the participants valued this tool as highly prioritized tool with great potential.

The anticipated favors were the increased communication between departments of the company, quick resolution of routine problems or situations, and more importantly a company wide sharing network that might enhance the experience level of employees, as well as bring them together to collaborate and define market trends and directions.

The potential setbacks such as the abuse of this environment, or the simple fact of that the contributions made to this forum might not necessarily be %100 accurate has not scared off the participants to vote against the expected favors. Even the company wide implementation and maintenance costs did not worry the participants.

This type of forum has always been widely recognized as one of the pillars of KM implementation. Due its relatively small cost of implementation, and its effectiveness, multinational giants such as Siemens and P&G have adopted initiatives that might be classified as forums. A favorite software package called “Ask me” has been in the service for a significant number of years in P&G. Although it has started out as a forum that was open to some selected employees, it has been so successful that steps are now being taken to open this medium to a much wider employee base. (www.askmecorp.com)

The main concern with applying this tool is defining ways to promote contribution. Regardless of their position, employees inevitably need to spare some time from their main duties and take part in discussions in the form of submitting or answering inquiries. Barth (2000) has a clear example in Pillsburry Co, a food company that started a R&D focus KM forum initiative and did not receive a single contribution to its forum in the 6 months it was operational. In one of our discussions with the participants, we asked this professional IT specialist if he uses anything similar to our KM tools in Turkey. He stated he frequently uses the internet message boards to find answers for the problems he is encountering. When asked if he had replied any inquiries on that message board, his answer was a clear no, he said he did not have the time to check or reply the inquiries.

A lot of companies have taken this problem head on and they tried to define adequate carrot and stick measures to increase contribution.

The 6th question tried to explore if a rewarding system for contributing to the forum would be considered appropriate by the participants. The Pillsburry and IT professional examples drove us into thinking a rewarding system would not just be beneficial but crucial for this application to succeed. Besides its long term effects to

foster a sharing culture in the company and increase contribution, we had anticipated that it might be the excellent method to capture the practical experiences in a very efficient manner.

With a 2.11 average, the implementation of a rewarding system was considered one of the least prioritized steps. The fact that Turkish business culture is open to systematic abuse of these kinds of incentives was probably the main factor in this negative outlook.

The second most important factor adding to this negativity was the worry that such a rewarding system might divert the employees from their main function and create a bottleneck. Result oriented is an adjective most commonly found in job announcements these days and on the contrary, in order to analyze, you will need to be at least a little process oriented. We personally thought the rewarding criteria would definitely have its effect on the quantity of the contributions, but at the same time it might degrade the quality of the responses submitted to this system. From the outcome of the survey it can be deducted that reverting to non financial rewarding systems, such as recognition and appraisal, could be wiser.

However in order for this recognition to have any meaning, the board must be utilized by managerial level employees as grounds for discussions or news.

It is very common for a KM specialist to come across this kind of evolution. The low amount of contribution leads to carrot and stick measures, the quantity rises significantly and the quality of contribution drop to the point of being completely useless. Barth (2000) has depicted a significant example regarding one of the pioneering companies in KM, IBM.

With more than 140,000 consultants in 160 countries, IBM is the world's largest provider of information technology services. But even IBM did its job so well that it neglected to manage its own intellectual capital.

Early in its history, leaders of the consulting group recognized the importance of conserving knowledge of client engagements, so it created an intranet-based repository of best practices. However, as the business grew, the process by which consultants contributed their experiences to the repository became unwieldy. It never occurred to them that they needed to manage the content.

To rectify this oversight, managers first added carrot-and-stick incentives for submitting to the intellectual capital management system. A consultant's contributions were reflected in performance evaluations and/or bonuses. "Everyone submitted. But we are on a calendar year, so 90 percent of our submissions came in between December 15th and 31st. Not only did they all come in at one time, but they were incredibly long and unintelligible," a divisional manager recalled.

There was no process to monitor the quality of the written contributions.

Forced to improve the method, IBM eventually created a community submission process, involving a network of experts that on a rotating basis review, comment on and request contributions to the knowledge base.

Once the process was in place, the intellectual capital management system became a key tool in IBM's consulting. In 1998 it won an award for best knowledge management process from Giga Information Group. (Barth, 2000)

As seen in the example, creating the perfect medium, or even establishing the rewarding criteria is not enough, a structure that will distribute responsibilities is needed. In the process of forming this structure, the fact that the real surprise contributions might be generated by the outsiders should never be neglected.

King, (2001) states the three main reasons that make the employees reluctant to share. Maintaining credit or ownership, losing control over their work and making mistakes are these factors. In order to maintain credit and structure Poston (2003) suggests assigning responsibility and content rating.

The seventh question was destined to explore this possibility of adding content rating and assignments to this forum structure, in order to compensate for the factors that faltered the previous modes of discussion board implementations in other countries and companies.

The King (2001) structure prioritizes maintaining credit or ownership as one of the key obstacles to sharing. Either for a project or for an obstacle, the people who contributed to the resolution must get recognition.

In 1999, Xerox published a set of Knowledge Management principles for sharing, these five principles were;

- Share what you know and what you do, build and expand company IQ.
- Discover what you do not know, see if a solution already exists
- Honor, respect and credit sources, build trust and reciprocity
- When in the doubt err on the side of sharing, protect what is private and confidential
- Collaborate with customers; suppliers and partners. Realize mutual learning value.

The third principle of Xerox clearly states that pillar of creating a knowledge sharing community. You have to recognize and honor the people which have successfully contributed and give them credit. (King, 2001)

In order to do this in a forum, the best way would be content rating. Honoring the participants is probably the most effective rewards of all. During most of our careers we strive to find and engage in useful and meaningful tasks. Gaining recognition on bringing resolution for an ongoing inquiry or a problem could be more fulfilling than a visit to manager's office for a pat on a shoulder.

This kind of content rating can be only achieved when it is conducted by administrators in the forum. In the forum mode that was proposed in the question, the survey tried to visualize a forum structure where departments and divisions would be split into several topics according to their special functions. The relevant executives would be moderating the forum, as well as the IT specialists who would be conducting the maintenance.

One of the setbacks this would inevitably bring to organization will be the increased workload of managers. There is also the factor to consider that not all of this content rating would be purely objective and it is bound to create discussions that some employees are favored by management, but these are all inevitable in every function of the company and these two worries were not enough to tip the balance to the negative regarding this method. More than half of the participants thought this kind of rating and moderation would be useful and it would enhance the use of the tool.

The moderation opens the door to a lot of new possibilities as well, such as highlighting specific topics where useful discussions are taking place and enlisting them under a key inquiries' section, similar to frequently asked questions you can

find everywhere nowadays. This moderation would also have the chance to see if the content shared is correct and even invite some expert opinion in if there is a requirement.

Although the approval rate of this method is a little lower than the concept of discussion board, it is a necessary means of effectively using this tool and it is worth considering when setting up the forum to at least design it in such a way that will enable these kinds of activities in the future.

Even though it has significant projected advantages, this forum concept we have been elaborating on is nevertheless a secondary activity in the employee's daily work. It depends on the willingness of the employees to share and contribute. What we concentrated on the following 8th question is concentrated on experience capturing, a form of data mining on the e-mail database.

In today's business environment a lot of communication traffic is handled via e-mail. The fact that this communication can be stored with tremendous ease always brings up its uses in knowledge management.

Kaufman (2002) states storing gigabytes of text and trying to do string searches can hardly be considered an effective knowledge management tool. He suggested that we needed a similarity ranking that would enable us to narrow our searches to specific lots and than browse in that search result. When we were devising the question we also proposed a mail directory structure, a folder storage system which classifies mails sent and received to customer and other departments in specific folders. We believe this sort of structure has the possibility of narrowing down searches to a great extent.

The participants were asked if they would consider keeping this kind of mail directory and meeting reports in a storage system, and make it available to other

employees, especially the future occupants of the position. The main negative factor anticipated had been ongoing debates about confidentiality, workplace ethic discussions.. Usually the idea of being monitored slows down employees, makes them harder to take responsibility and make them uneasy.

There were other negative factors to consider as well, such as a new employee finding out the history of a problem, or a situation that has crippled the predecessor's performance. Seing that the problem persists could cause the loss of the new employee's motivations.

Another possible setback could be companywide confidentiality reasons. A new employee with a right to browse through the old records could find out crucial information and this could be considered as a direct threat to the company. They could leave prematurely and take with themselves significant amount of knowledge on the preceedings.

The final negative factor would be the investment required to keep this kind of database up and running.

Even though all of these factors were solid reasons not to prioritize this tool, a strong 4.29 mean was the outcome of this question's responses. Highly above expectations, this tool was highly regarded by the participants due to the noteworthy effect it would have in bringing up the newcomers to speed, regarding processes, outside contacts and in house communications.

The e-mails and the meeting reports are excellent places to find prior experience. It is the primary goal of knowledge management to dig up these experiences without too much effort and save time for the company. What these procedures are saving is not just the time of the first person, they also save the time of the colleagues employee turns to resolve the problem.

Also this kind of tool will enable the smooth transitions during employee change and it will ensure continuity. These three major benefits and the way they are achieved by this tool have gained respect from the participants.

Even though this particular tool received substantial backing on a company wide initiative, we felt the need to devise a second question on the subject, a restriction, or a moderation on this e-mail database access right.

Even at the first steps of implementation of KM initiatives, a lot of attention should be paid to confidentiality issues. A restriction in the format of enabling the access of such repository by department managers could provide a solution. The 9th question stated "Would you prefer this mail browsing right to be confined to department managers and let them provide the employees with the necessary information".

The model was trying to give managers' power over company's confidential assets and how they are used. The setbacks would be an increase in manager's workload as well as the restriction of a tool that could be very effective in daily routines. Our primary worry was that it could foster an untrustworthy medium due to restrictions and cause problems in developing the knowledge culture.

Some of the feedback we received from the participants stated that everything should be open, they argued that all employees would be bombarded with sensitive information every day and you would have to trust them sooner or later. However the mean of the responses received to the question was 3.06 and this mean is enough to emphasize on confidentiality.

The participants did acknowledge the setback but the average makes us think we should look for better solutions to this problem.

The tenth question focused on document management which is considered an inevitable part of knowledge management. Especially in companies which have operations in a wide area, it is crucial to let employees to reach documents such as quotations, invoices, delivery notes, reports, special technical and quality related material. Nowadays MRP systems such as SAP enable reproduction of most of the official flow documents, however it is also crucial to reach critical documents as process correction or improvement records, flow charts, process charts in order to see what can be improved. The 4.14 point average of the replies to this question state they value this document management as an integral part of KM, mostly due to the fact that, it was mentioned in the question that a different level of authorization would be needed to view different types of documents and this would change according to rank and status. Removing this only negative factor out of the way, most of the participants felt it was a positive idea.

The problems of maintaining such database, the amount of scanning, sorting and filing that needs to be done and the amount of extra workforce and budget required for this application, were clearly not big enough worries for the participants.

Question eleven had focused on mail groups as a knowledge management tool. It was phrased in the question so that it would include the model in favor and test its approval rating.

It is very useful to have companywide and department mail groups. These groups could boast information such as new products, new regulations, sector information, company information and new agreements.

The setbacks that we had been anticipated were the workload of the employees who would be associated with preparing these kinds of mails. It is very

hard to measure the impact of such an application, therefore it might be hard to justify the resources allocated to this tool.

However, the advantage of employee knowledge improvement and employee motivation it would bring outweighed the anticipated negative effects and the average of the replies given to the question is high enough to consider this tool as pivotal.

The 12th question focused on the human resources aspect of KM applications. It is often that someone might have the expertise or the experience that the company requires but due to lack of an expertise index, the right contact is never found.

A company set out to implement KM should first look to own resources of the company and see what their capabilities are, consequently, with human capital as being the primary asset in business today, it is crucial to map what kind of human capital you have got in a fashion that can be easily reached by in house sources.

The evident advantages are the capability of finding in house specialists that can be consulted for opinion. It can greatly ease the process of project groups such as quality chambers and communities of practice.

On the other hand, we should also count in the factor that this will inevitably increase the workload on the qualified personnel. It also has the danger of igniting a social competition throughout the company, undermine team spirit and increase prejudice.

The responses received for this question had an average of 3.66. It seems safe to say this is considered an important tool for a company wide KM implementation. Tapping in on the company's own resources is a cost effective resolution to many of the day to day problems a company might endure, and at the same time it will increase communication and collaboration throughout the company.

Another very important aspect of KM is fostering intellectual capital via learning. Throughout our research we have come across various models which suggested focusing on specially tailored e-learning programs instead of company wide outsourced general training programs. In fact some of the Fortune 1000 companies, such as Canadian Imperial Bank of Commerce, scrapped their communal training programs all together and instead set forth a few underlying abilities that needed to be addressed for each department. They expected their employees to structure their own learning and training on enhancing these main abilities by providing e-learning and e-library opportunities. (Allee, 1997)

The participants' view of this model was put to test by directing them the question if they favored any model over the other. By averaging 2.80, the participants stated an almost equal weight should be given to knowledge e-learning and outsourced training.

This balance is in contradiction with the current state of the market in which nearly all training are either outsourced or in house general trainings. It must be stated that there is a vast potential in specifically tailored e-learning solutions and this could be one of the highest impacting knowledge management tools of a company wide implementation.

There are certain advantages of using generalized outsourced solutions. To start with they are deployed by professional companies, this is bound to increase the success rate of training. They are also much easier to evaluate and they increase in house communication by stepping out of the routine communication cycles. Most importantly, they are versatile and they do not sustain fixed costs, you can arrange them according to your convenience, in terms of finance and schedule.

On the downside, their outcome will be general organizational behavior improvements or better use of a new quality system or software. They will hardly benefit any special abilities that you might want to improve, in a special sector or department. The outsourced trainings have also the risk of being high cost.

The specifically tailored e-learning solutions might be more convenient in enhancing specials skills or abilities, even processes. The managers can also assign the employee training for specific abilities which they see lacking. This will result in better efficiency and increased customer satisfaction.

One of the major disadvantages would be motivating the employees to spare their time to work on these trainings and enhancing their abilities. A "carrot and stick" system could be employed to increase the effectiveness. Another problem could be evaluating this kind of education, due its personalized structure measuring the progress will be much harder compared to a standard training evaluation. It will inevitably add to the workload of management level employees as well.

The fourteenth question focused on another form of information retrieval engines, data mining. In most companies, the information regarding the customers is strictly limited to invoices and accounting information. Regarding project oriented sectors it is very common to come across specific depositories which include all the written collaborative material regarding each specific customer. However it is extremely rare to find detailed information about all the company visits and teleconferences. Any knowledge that might be gained from the company, such as market trends, new projects, restructuring information, turnovers, sector standings, a list of corrective/improving actions that are performed by the request of this customer and detailed descriptions of the relations with the contact people within the customer is very crucial. The participants were asked if they favored the keeping of

such a broad database in spite of the obvious setback of the fixed cost and effort of running and promoting such a database.

The main question is whether or not the frequency of use regarding such a database will justify the cost of running. There is also the secondary problem of measuring the benefit of employing this kind of knowledge management tool.

The participants were notified of the anticipated setbacks and their tendencies were leaning towards high preference of deploying this tool. It seems the expected benefit of a database storing feedback from the customers and helping to form sector or project based generalized solutions was the main contributor in this selection. Maintaining such a database will significantly enhance the relations with customers. It will give a great insight to new employees by giving solid background information on the customer base.

The fact that this database might become a very valuable asset on its own should not be neglected. The utilization of this database might also be extended suppliers as well.

Building on customer knowledge and structuring the business in the guidance is a very important aspect of success in today's business. However it is equally important for a company to tap into its own resources and find out what the employees have to say about processes and improvements. The fifteenth question asked if creating internal feedback mechanisms in the form of a moderated and filtered discussion board to which the employees could log on anonymously, would be beneficial for the company.

The main worry was that most of the employees could focus on improvements to their own situation rather than improvement to the company.

In addition to that, just like the previous tools, it would be very hard to measure the impact this will have. Whether or not the utilization will be frequent enough to make it feasible was another question.

However a significant amount of the participants valued this tool as a tool with potential and suggested that it would be deployed as a low priority step.

The main benefit that lead the participants to vote in favor of this tool was the opportunity of being able to suggest recommendations without the worry of attracting negative response from certain individuals, particularly in management. By presenting a medium where the application level employees can express their recommendations bluntly and discuss about them, the company will have a chance to perfect its flows and processes.

6) CONCLUSION

The results of our survey clearly indicate the average Turkish knowledge worker is not comfortable with displaying the inner structure of the firms to outside users. Most of the participants preferred department contact publishing rather than personal contact publishing and the idea of publishing organizational structures and personal functions on open web pages did attract very little interest.

The participants felt more positively about this information to be published on extranets so it is very important for a company in Turkey to establish a good structure for intranet and extranet pages before they start Knowledge Management system implementation.

Discussion boards have found good recognition among the participants, however the carrot and stick incentives in the form of bonuses that are required to maintain contribution, ranked least in all of the 15 questions that made up the survey. The KM specialists who are taking on an implementation project in Turkey should bear these factors in mind and come up with creative ways of promoting contribution. Content rating and recognition by moderators could be employed, even though the support for this method was moderate.

E-mail repositories have been a strongly supported tool in our survey. However it is imperative to make sure they are being stored in a "folder and conversation" structured manner. Even though access rights were not a big worry for our customers it would be wise to put some boundaries. These repositories should be search enabled as well.

Document Management Systems were also prioritized by the participants but the frequency of use should be very carefully projected as this probably would be the

most costly of all implementations. For confidentiality issues some restrictions need also to be applied.

Mail groups have also found good recognition among the participants and they should be perceived as one of the first tools. As these groups would enhance sharing culture they will help other tools to find recognition as well.

Yellow pages of expertise have found adequate support and participants favored it as a non-crucial but important tool, this tool can be prioritizes as well.

Regarding trainings the participants favored group solutions just slightly more than personalized solutions, however if we consider group solutions are pretty much the only solutions in our business environment nowadays, there is definitely a great potential in this aspect of knowledge management.

Information retrieval engines in the form of customer information databases have also found great recognition among the participants. Some very good implementations, even among successful Turkish companies such as Kariyet.net have been observed during the course of this research, so this tool is also one of the highest priority tools.

The last tool in discussion, namely anonymous employee discussion boards for internal feedback, was also favored by most of the participants, not as one of the priority items though. It would be wise not to implement the two discussion boards simultaneously as it would distract the focus. In fact considering this anonymous board as step that has to be taken after the initial discussion board has settled would be wiser.

As future direction, we believe it would be beneficial to conduct this survey in different sectors and find out the sector's priorities in Knowledge Management. Due to time limitations we could only analyze the general tendencies of the participants however our data can pave the way for sector based research projects.

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APPENDIX A

Bahçeşehir University Industrial Engineering Department
Graduate Thesis Research
Knowledge Management

Survey

Name:

Company Name:

Company Sector:

Approximate number of employees:

Ownership Structure:

A) **Local Venture**
B) **Local Foreign Joint Venture**
C) **Foreign Venture**

1) Would you approve the publication of personal contact details and organization tree on the company website?

Expected advantages	**Decrease Bureaucracy,* **Increase Intellectual Capital Rating,* **Enhances Customer Focus*
Anticipated disadvantages:	**Increase proness to spam and telemarketing calls* **The worry that a certain customer might get in touch with different departments and employees simultaneously and cause duplication of effort*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

2) How well would you consider omitting management level contact details from this kind of publication?

Expected advantages **It would be best for the company if these types of inquiries were directed to lower level employees, this way the management will not be flooded with excessive and irrelevant workload*

Anticipated disadvantages: **Increase bureaucracy*
**The worry that certain potentially key inquiries, feedbacks or customers could be underrated by the junior staff and go neglected*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

3) Would you prefer publication of department phone numbers and e-mails over personal phone numbers and contact details?

Advantages of publishing department contact details:
** The preservation of communication flow and continuity*
** Eradicating the need for constant updating in the dynamic employee structure of today's economy.*
** The ability of Department Manager to allocate incoming requests to employees based on workload, therefore increasing efficiency*

Advantages of publishing personal contact details:
** Direct association of employees with the incoming inquiries will increase responsiveness*
** Direct association of employees with the incoming inquiries will increase return rate*
** The ability to enlist additional information with contact details, such as sector specific, or function specific job descriptions will ensure the customers and suppliers will reach the right contact more easily.*

1) I find the publication of only department e-mails and phone contacts adequate
2) I find adequate the publication of department e-mail details only

3) I find adequate the publication of personal e-mail details only
4) I find adequate the publication of personal e-mail and phone details
5) I find adequate the publication of additional information such as job description or specialties together with the personal e-mail and phone details.

Is there any contribution you would like to add to the benefits of publishing department or personal contact details?

4) Would you find adequate the publication of your organization scheme and personal contact details with additional information in the company extranet portal?

Expected advantages:	** The versatility of having such a directory would ease contacting the right person, especially for big companies that are active over a vast region* ** Cut down bureaucracy* ** Increase reaction speed*
Anticipated disadvantages:	** It increases the probability of reaching wrong people and increases their workload* ** It can pave the way for inter company problems to reflect to the customer side and cause problems between departments and customers.*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

5) How useful would you consider, in your company intranet web page, the implementation of a department or market segmented message board, in which the employees can log on with their personal identities, ask questions, respond to questions, discuss job functions market feedback and technical details?

Expected advantages:	** Increase communication between departments* ** Avoid re-inventing the wheel by enabling use of previously devised solutions to every day problems.* ** Increase innovative problem solving* ** Contribution to diagnosis of problems and new market trends and increase in employee knowledge*
Anticipated disadvantages:	** The fact that not all of the contributions are 100% correct* ** The possibility that this kind of medium can be abused and create inefficiency* **The cost of maintaining this database*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

6) Would you consider a bonus incentive depending on contribution in order to promote usage of this medium?

Expected advantages:
* *Increase contribution*
* *Help foster sharing culture*

Anticipated disadvantages:
* *Incentive could be prone to abuse*
* *Could cause disregard for main employee functions*
* *Degrading of the quality of contribution*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

7) Would you consider useful, the moderation and content rating of such a discussion board by department heads and assigned moderators as well as content's usefulness rating by readers?

Expected advantages:
* *It will increase the quality of the discussion board*
* *It may assist the carrot and stick incentive*
* *Help filter incorrect contributions*

Anticipated disadvantages:
* *Increase manager workload*
* *The fact that ratings would not necessarily be objective*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations

5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

8) How useful would you consider the storage of company's e-mail archives and meeting reports, in a searchable, browsing enabled, company & department wise categorized manner, in order to help the new employees to use adapt more quickly by learning from the past experiences?

Expected advantages:
* *Bring newcomer's up to speed more quickly*
* *Enable continuity in communication and work*
* *Avoid re-inventing the wheel*

Anticipated disadvantages:
* *Being able to see prior problems could decrease motivation*
* *The confidentiality worries about opening a vast resource of the company to a newcomer*
* *The fixed cost of running this infrastructure*

1) I would not approve it due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

9) Would you find it more appropriate if the e-mail search engine was a restricted right belonging to managers and it would be exercised by or within close supervision of the relevant divisional manager?

Expected advantages:
* *Decreased confidentiality*
* *Increase customer satisfaction and even communication between departments*

Anticipated disadvantages:
* *Increase manager workload*
* *It could hinder informal communication between clients due to big brother effect*
* *It could create a medium of insecurity and untrustworthiness*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

10) Would you consider it useful if a digital copy of all the documents in your company were stored on servers in a way that enables you to conduct string searches and view them according to your confidentiality level?

Expected advantages: ** The ease of reaching the necessary documents even from far out offices*
** The benefits of reaching all the evolutionary and correctional steps, related reports, announcements and technical specs*

Anticipated disadvantages: ** The huge cost of maintaining and updating this database*
** Confidentiality issues*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

11) Would you consider it beneficial if the company had department specific and companywide e-mail groups in which sector related information, company related information, technical information, new agreements, new regulations and new announcements would be featured?

Expected advantages: ** Increase knowledge and motivation*
** The benefits of a medium in which company successes, achievements, technical breakthroughs and new regulations can be presented to employees*

Anticipated disadvantages: ** Increase in e-mail traffic*
** The workload needed to prepare the content*
** Difficulty of measuring impact*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

12) Would you consider useful the intranet publication of a yellow pages of expertise database that includes the employees' previous work experiences, past trainings and qualities in a CV resembling format?

Expected advantages:
** The benefits of documenting company's employee's knowledge base and utilizing these anonymous in-house experts in time of need*
** The ease it would bring to forming project groups and quality circles.*

Anticipated disadvantages:
** Increase workload of qualified personnel*
** Increase prejudice and competition, harm team spirit*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

13) Regarding your company's workforce training, would you prefer general solutions that are prepared by outsource expert companies, or would you prefer personal learning solutions in which the employees rely on developing basic qualities, which have been previously determined regarding a specific department or a position, through company supported e-learning, knowledge bank, or even a small scale focused library mediums?

Preferring outsourced general solutions

Expected advantages:
** Because these trainings are carried out by expert companies they tend to be more successful and they tend to have a more penetrative effect*
** Easier to measure the effects*
** By stepping out of classic communication circles it enables the company to form informal channels of communication*

** Outsourced training are versatile, there are fixed costs and they can be arranged depending on the status of the company*

Anticipated disadvantages:
** In general trainings there is now way to focus or specifically tailor the training for each employee's needs, therefore most of them concentrate on enhancing general work processes or communication failing to improve necessary key qualities*
** These trainings are relatively high cost solutions.*

Preferring personal training solutions

Expected advantages:
** It enables department or sector specific focus*
** Enables personal advance by the guidance of management*
** Increased customer satisfaction resulting from advanced main function qualities*

Anticipated disadvantages:
** The fixed costs of sustaining such resources*
** The difficulty of motivating employees for this kind of personal training*
** Harder to measure and analyze impact*
** Increased workload for managers*

1) I believe outsourced general trainings will be the only effective solutions
2) I believe outsourced general training should have more priority
3) I believe personal and general trainings should be prioritized equally.
4) I believe personal training should have more priority
5) I believe personal training should be the only training as it will have the most effect on the company performance.

Are there any advantages or disadvantages you can add to the ones listed above?

14) Would you consider useful the utilization of a frequently updated database that lists all the customers you work with and includes their sector, their situation, their turnovers, their projects, reports on this company, visit reports, solutions tailored for this customer, customer side contacts, company feedback, corrective measures for this company and preventive measures for this company?

Expected advantages:
** The ease it will bring to designing sector and project specific solutions*
** Providing documentation of feedback will help analysis in decision making*

** Ensure continuity in customer relations*
** The value of this database itself in future*

Anticipated disadvantages: ** It would significantly increase the workload to assigned employees*
** Worries over whether if it the frequency of use will balance the cost and time needed to maintain the database*
** Hard to measure benefits*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?

15) Do you think an anonymous and filtered discussion board in which the employees can log on outside of the work hours in order to submit their ideas and critics without revealing their identity would be beneficial?

Expected advantages: ** It would enable an environment in which employees can submit their feedback without worry*
** It can enhance process re-engineering*
** Its value to HR functions*

Anticipated disadvantages: ** The fact that the employees might focus on issues with their own benefit in focus*
** Whether or not the frequency it will be used be feasible for keeping it running*
** Hard to measure impact*

1) I would not approve this restriction due to the disadvantages
2) I consider it as a step that should be implemented at the very end.
3) I value it as a useful but non priority step.
4) I am hopeful about the advantages and I think it should be one of the first implementations
5) I truly believe in the advantages and consider this as a priority.

Are there any advantages or disadvantages you can add to the ones listed above?