The Knowledge Competence Development and use of Information Technologies in Small and Medium-Sized Enterprises in Kazakhstan

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Abstract
Background/Objectives: This paper explores the theoretical perspectives on knowledge competence, use of technologies and development of SMEs in Kazakhstan in view of lack of research in this area. Methods/Statistical Analysis: Questionnaire survey was designed to study the opinions of top management of SMEs from different regions of Kazakhstan about their companies' performance. Statistical analysis was applied to process the obtained results. Findings: The descriptive data have been collected via a questionnaire survey of SMEs directors from different regions of Kazakhstan. The results reveal good pre-conditions for further development of knowledge competence in SMEs in Kazakhstan. This study has shown the situation in the Kazakhstani SMEs in terms of knowledge development opportunities as well as the existing situation with the use of information technologies. The ability of SMEs to use the existing knowledge determines the success of companies' strategies. Applications/Improvements: The “DAMU” role in creating the new knowledge for entrepreneurs and financial support may contribute to the development of information technologies and knowledge competence in the long term.

Keywords: Information Technologies, Kazakhstan, Knowledge Competence, Small and Medium-Sized Enterprises (SMEs)

1. Introduction

The development of knowledge management has attracted researchers’ attention in the past 20 years. Knowledge is considered as a driving force for a company's development. Several authors systemized literature on knowledge management in SMEs in particular and identified that SMEs experience less formal structure, lack of resources and flexibility'.

Knowledge competence is related to knowledge management but at the same time is different. Some recent works explored components, elements of knowledge competence and its influence on a company's performance. Components of knowledge competence such as knowledge accumulating and knowledge operating capabilities represent a company's competence in knowledge. Therefore, information technologies being one of the important elements of successful knowledge management should also be considered in conditions of a company's knowledge competence.

In current literature, the role of the IT and knowledge management has been explained in terms of knowledge management capabilities. In this regard, technology is one of its elements. Moreover, existing studies in knowledge management highlight the possibilities of big companies compared to small and medium-sized companies which are limited in the information technologies often due to the lack of financial resources.

This research is aimed to study the use of technologies in SMEs in Kazakhstan. By studying how the Kazakhstani SMEs are developing their information technologies this
The article makes a unique contribution to the new topic of knowledge competences.

1.1 Knowledge Competence

According to Ning and coauthors, knowledge competence is a “knowledge system that can synergy and reconstruct the resources, knowledge and capabilities within and without the organization to realize the harmonious development with its environment”. Knowledge competence consists of knowledge accumulating capabilities and knowledge operating capabilities because knowledge assets depend on those capabilities and are limited to represent knowledge competence. Knowledge accumulating capabilities include learning capability and knowledge assets while knowledge operating capability consists of culture capability, communicating capability and innovation capability. Knowledge accumulating capabilities “make the quantity and quality of the knowledge assets adapting to the competitive environment” and knowledge operating capabilities “make the knowledge assets effective and profitable”. These elements of knowledge competence create a relationship where the level of each determines the level of knowledge competence, where the higher the level of the knowledge competence components, the higher knowledge competence itself (figure 1).

1.2 Knowledge Management in SMEs

According to Gray, SMEs have several challenges which depend on the areas such as existing the organizational and technical knowledge base, acquisition and creation of new knowledge: “keeping the firm’s capabilities, resources and routines up to date; maintaining the owner-manager's entrepreneurial and management competences; acquiring new knowledge, which raises issues concerning the source of information (formality/informality, education/experience), the internal absorptive capacity for interpreting and absorbing the new information as applicable knowledge and the use of the new knowledge; creating new knowledge, which also raises very interesting and challenging issues concerning innovation, creativity and strategy”.

Lim and Klobas identified that the difference in the number of employees, different scope of business, financial and administrative differences are affecting knowledge management in the organization. They argued that knowledge management practices are mostly focused on big companies because of their financial access to technologies and consulting.

1.3 Information Technologies

Information technologies play a very important role in any organization. There are four reasons for the acquisition of ITs in SMEs: increased productivity, streamlining work procedures, better client service and better record keeping.

ITs can help organizations to perform multiple functions and organize work processes in different areas. Therefore, the relationship between information technologies in the organizations and humans should be synchronized. Information technologies help employees to collect and analyze data as well as improve decision-making processes in their company. Because ITs allow acquiring data which later employees use to create new knowledge, it is crucial for the companies to keep their information technologies up-to-date. Data and information which are analyzed and created by information technologies enable employees to create innovations.

The role of information technologies in the organizational development can be identified as a strategic one. Economic changes, external environment, competitors stimulate the company to develop new strategies, implement and control processes. ITs can bring technological competitiveness to the company. The use of appropriate information technologies defines the company’s position and sets a path for future development. Organizational productivity has a positive relationship with organizational information technologies. However, only constant implementation of information technologies into the organizational processes can positively affect long-term

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*Figure 1. The relationship between the knowledge competence components according to Ning et al.*
development of the company and stimulate improvements in its performance. The main requirement of technologies is financial investments. Large companies, as compared to SMEs, have an advantage in an access to resources, therefore introduction of its into the organizational processes more often happen in the large organizations.

Knowledge management and information technologies relationship is focused on improving the existing processes in the company and using the required ITs where they are needed for more successful functioning of the company. Therefore, only appropriate technologies and right application of them helps companies to manage knowledge. Because information technologies themselves cannot fix organizational problems, they need strategic execution. Ability of information technologies to improve organizational processes does not decrease the importance of employees who are managing these technologies and take important decisions on the basis of IT outputs.

Tacit and explicit knowledge with the use of information technologies becomes more acceptable for employees and there is an opportunity to generate knowledge in a virtual space. The possibilities of virtual space help the companies to share knowledge and stimulate knowledge development through information technologies. Because virtual space connects every employee to the same system, it creates opportunities for knowledge development to be stored and shared within the teams or departments who are in charge of particular knowledge and apply it to solve any problems in their operations. However, the level of trust is required among members to share and transfer information.

Information technologies can improve organizational knowledge in the context of SECI processes. Owing to the nature of knowledge and processes which happen with them, information technologies can stimulate the development of knowledge.

Organizations that are willing to invest in information technologies may improve coordination, transfer and use of knowledge. The nature of knowledge makes it unique and inaccessible to others.

Moreover, ITs can prevent mistakes in sharing same knowledge and make the whole process of knowledge transfer more efficient and effective. It is difficult for employees to exchange all available knowledge, therefore use of information technologies makes the process more transparent, organized and recorded, so that everyone has an access when particular knowledge is needed to find a solution for a particular problem in the company. ITs cannot be managed without humans; therefore all knowledge which is available for the company becomes a source for creating innovations and improving organizational performance in new ways. Thus, the relationship between knowledge and information technologies has an impact on the company’s development and positive changes in the performance. From this perspective, relationship of knowledge and information technologies becomes vital for any organization.

Knowledge management technology includes four processes:

- Knowledge identification and generation – identification of processes and creation of new knowledge;
- Knowledge codification and storage – transforming knowledge with the use of information technologies and storing;
- Knowledge distribution – distribution of the stored knowledge with the use of information technologies in the company;
- Knowledge utilization and feedback – using and retrieving the needed knowledge in the organizational processes and giving feedback about the knowledge quality and access to it.

However, companies which use ITs in managing organizational knowledge depend on organizational culture which can help to successfully implement information technologies. Many authors identified positive relationship between knowledge management technologies and organizational culture. Moreover, information technologies in managing knowledge bring more value to the company when there is a knowledge culture.

According to McKay and Brockway, information technologies can be divided into three categories: knowledge-oriented technologies; function-oriented technologies and specialty-oriented technologies. These technologies render assistance to the companies in managing knowledge and improving processes inside the company.

Implementation of information technologies in knowledge management processes help organizations to develop personal knowledge management. Personal knowledge management refers to employees’ ability to use ITs in developing knowledge, organizing and using information. Apart from the organizational culture which creates an environment for use of information tech-
nologies, employees need several skills such as ability to retrieve, evaluate, organize, analyze, present, store and share information. However, information should have three dimensions for its successful use by the employees:

- Information quality – proper interpretation and transformation of information to knowledge;
- Information accessibility – easy access to information positively influences employees' ability to use it;
- Ease of using the tools – ability and conditions enabling to use IT tools.

Thus, information technologies create more possibilities for knowledge development in the company which can lead to the development of innovations in the organization. Employees' ability to take advantage of technologies stimulates knowledge use and application. However, type of the company's IT use determines the success and positive impact of those on the organizational processes. Knowledge management technologies are targeted to knowledge management processes in the company.

1.4 Development of Knowledge in the Kazakhstani SMEs

The economic development of any country depends on SMEs. The role of SMEs in the economy of Kazakhstan is crucial for multiple reasons. The first reason is the ability of Kazakhstan to make changes and shift from its dependence on natural resources. The second reason is the safety which lies in creation of own products and services. The third reason is the development of SMEs, which results in positive social changes.

The government role in supporting SMEs is significant. JSC Entrepreneurship Development Fund “DAMU” was organized with the mission to “promote quality development of SMEs in Kazakhstan through comprehensive support, including a wide range of financial instruments and competencies development programs. DAMU provides financial and non-financial support for SMEs. Nowadays they provide support for entrepreneurs through several programs, such as:

- Programs of the stipulated placement of resources in the SLBs and the subsequent crediting of SMEs
- Program for Conditional Placement of Funds with the Second-Tier Banks for Subsequent On-lending to Microcredit Organization
- “Damu-Komek” Program to support entrepreneurs with disabilities
- “Damu-Ondiris” Program for the support of SMEs operating in the field of manufacturing
- Financial program of leasing transactions of SMEs operating in the manufacturing sector through STBs and leasing companies
- Microcredit Institution Financing Programs
- The Program of conditional placement of funds in STBs for further micro crediting of women entrepreneurs
- The Program of regional financing of SMEs
- The Program “Center of entrepreneurs' support”
- The Program of financing SMEs in small towns of Kazakhstan
- The Program of SMEs funding within the loan from the Asian Development Bank (1-2 tranche)
- The Program of funding private enterprises, engaged in service sector in Astana and Almaty
- The Program of financing SMEs' leasing transactions
- The Program of regional priority projects of SMEs in the regions “DAMU regions III”
- The Program for the development of single-industry towns in 2012-2020
- The Support Program for SMEs in manufacturing
- The Support Program for SMEs in manufacturing and services related to support manufacturing industry (2 tranche of National Fund)
- The Support Program for SMEs in manufacturing (3 tranche of National Fund)

Moreover, the Fund introduced several projects for developing knowledge of entrepreneurs as a part of Program “Roadmap – 2020”, such as given in Table 1:

- Business Adviser 1 and 2
• Business Connections
• Training of top management of SMEs

Business Adviser is a short-term program for people with entrepreneurial initiative and existing entrepreneurs. This program is focused on creation of own business, marketing, human resources management, finances and legal education. The program includes several topics: introduction to business, psychology of entrepreneurship, business planning, marketing, human resource management, finances, legal issues in business, ICT for business.

Business Connections Program is aimed to improve business relations of Kazakhstani entrepreneurs and cooperation with foreign companies. The project has 2 stages. The first stage is three-week's business training conducted by qualified consultants in Kazakhstan aimed at developing the negotiating skills, drawing a business plan, searching foreign partners. The business stage is the final assignment for the stage one. Those who completed the first stage successfully may participate in the second stage of the project. The second stage is a business internship in Germany or the USA. During this stage the first stage participants of the Business Connections Project as well as the participants of SMEs Top Management Training Project may visit similar companies to explore specific issues in their business, transfer of knowledge and information technologies, creation of alliances and joint ventures.

SMEs Top Management Training project has three stages. At the Stage 1 the entrepreneurs have three days of training aimed to increase knowledge and skills in creating successful business, improving skills in business management and seeking out future opportunities. At the Stage 2 the participants have three online courses during one month on the following topics: legal issues in business, attraction of investments, and successful presentation of a business plan. At the Stage 3 the entrepreneurs finalize their business plans with the support of the Nazarbayev University lecturers. Business plans translated in English are evaluated by the Duke University experts. Those who successfully completed all stages get a certificate from the Nazarbayev University and Duke University, as well as an opportunity to have a business internship in the USA and Germany.

2. Method

2.1 Participants’ Characteristics
Top management of SMEs from different regions of Kazakhstan participated in the survey as previous research found that in SMEs the role of the top manager is a key one since they possess majority of the knowledge existing in the company and they often fill several positions.

2.2 Sampling Procedures
Questionnaire was sent to 30 SMEs located in the different regions of Kazakhstan from DAMU Fund database.

2.3 Sample Size
Thirty completed questionnaires were returned in total.

2.4 Measures
This is a descriptive research which aimed to observe the use of information technologies in SMEs in Kazakhstan as a contributor to the knowledge development. The questionnaire survey was designed on the basis of IT types from Reyes and Raisinghani and included some demographic questions about respondents and questions about company performance.

2.5 Limitations
Low level of the entrepreneurs’ willingness to participate in the survey resulted in a very limited number of eligible responses.

3. Results

Out of 30 questionnaires sent out, we received back all 30 with 100% response rate. With regard to education, 83.3% of the respondents have a bachelor degree, 10% MBA or a master degree and the rest have a high school diploma.

3.1 Analysis
The respondents of this survey were asked several questions regarding use of information technologies in the company and its performance.

Figure 2 shows the state of IT using by SMEs: 100% of SMEs use the Internet, 13.3% use automated manufacturing, 10% of SMEs use data warehousing and only 6.6% use knowledge management software.
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Figure 2. Use of technologies in SMEs in Kazakhstan.

Figure 3 represents improvements in the performance of SMEs. The entrepreneurs were asked questions about financial indicators, market share and growth over the past three years. As a result, 36.6% of entrepreneurs consider that their financial indicators are higher than those in the industry over the last three years; 40% identify that their company’s market share is improved in the last three years; 56.6% of entrepreneurs consider that the company’s growth is improved in the past three years.

4. Discussion

The study examined the use of technologies in the Kazakhstani SMEs. The analysis shows that majority of the companies do not use any other technology except the Internet, although some of the SMEs have an access to the data management system, data warehousing and knowledge management software.

There is a slight difference in ability of SMEs to have more complicated technologies rather than a simple, more accessible one, such as the Internet. However, performance of the companies in the past three years shows positive changes. More than a half of SMEs experienced growth during this time period. Although, financial indicators and market share have not been improved in the majority of SMEs, the “DAMU” role in creating new knowledge for entrepreneurs and financial support may contribute to the development of information technologies and knowledge competence in the longer term.

5. Conclusions

This paper provides insight in the theoretical issues of developing knowledge and information technologies in SMEs. The unique role of knowledge in any organization determines the level of employees’ involvement in the development of knowledge in the company. This study shows the situation in SMEs in Kazakhstan in terms of knowledge development opportunities as well as the existing situation with the use of information technologies. The ability of SMEs to use the existing knowledge determines success of the company’s strategies.

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