



An investigation into the effect of quality management practices on the process of knowledge production in industry, mine and trade organization of Ardabil

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ABSTRACT

Keywords:

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Practices, Knowledge
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The purpose of this study was to investigate the effect of quality management practices on the knowledge production process in industry, mine and trade organization of Ardabil. Considering the purpose of the study, the present research was an applied research and in terms of method, it was a descriptive and correlational one. The population of the study consisted of all employees in industry, mine and trade organization of Ardabil which included 197 individuals. Cochran's formula is used to determine the sample size and according to this formula, the number of obtained samples was 125. Simple random sampling used for the sampling of this group. Two questionnaires were used to collect data. For assessing the process of knowledge management, knowledge management questionnaire and for measuring the quality management practices, the standard questionnaire of Saraph, Benson, and Shroeder, (1989) came into use. For data analysis, S statistical software was applied and univariate regression analysis was used to analyze the hypotheses. The results showed that quality management practices had significant positive impact on the process of knowledge production. Also, support components of senior management, quantitative report, employee training, employee participation, product design, quality of supplier, process management, and the role of quality management all had significant positive effect on the process of knowledge production.

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Introduction

Today's knowledge is placed at the heart of the world's economy and knowledge management is considered a vital affair in the success of companies. Nowadays, organizations and companies are in search of sustainable competitive advantage and in today's complex environment competitive advantage is nothing but the organizations' and companies' knowledge of their competitors and gaining a greater share of the market. This fact is quite tangible especially in engineering companies. The size of the content related to the knowledge of organization and management and development of them has increased gradually and progressively; so that, today, we cannot refer to organization development unless first we establish a culture of learning, refer to collective learning, and institutionalize it at all levels of the organization. Put differently, there is no way to be successful and have sustainable development without organizational learning and knowledge management.

In fact, knowledge management is a new approach to the sources and causes of organizational strength and to the belief in the importance of creativity and innovation. Production, organizational knowledge acquisition, preservation and maintenance of it, distribution and sharing of it, its application, and finally its development and evolution has become the main concern and task of organizational managers such as engineering organizations (Habibi, 2008). Companies to survive in the knowledge society must learn to manage their intellectual property. Perhaps there exists little new research about the classic production factors but knowledge management is in its infancy. Knowledge is the only resource which increases by using (Probst, Raub, & Romhardt, 2000).

Given the role of new knowledge in the survival and growth of the organization, sometimes the generated knowledge seems more important than existing knowledge. New knowledge allows organization to improve its performance, develop its ability, and take advantages of available recourses in the more appropriate form. Therefore, the realization of concepts such as continuous improvement, organizational development, and gaining sustainable competitive advantage depends on the continuation of the process of knowledge production in organizations. This aspect seems to be a simple concept but in practice many organizations in creating necessary grounds for knowledge production face difficulties. This can be caused by managers' lack of familiarity with the components of knowledge production in organizations and by the effect of these components on the process. Knowledge management must be used purposefully for organizational knowledge production through the synergy and interaction of staff. Therefore, today, many organizations are trying to increase their innovation capacity and competitiveness by the effective implementation of knowledge

management projects in the organization. Knowledge production involves four basic dimensions, namely components of externalizing, combination, and internalization.

One of the factors involved in the process of knowledge production is management particularly quality management in organizations which is studied in this research. The current study aimed to investigate the effect of quality management practices on the process of knowledge production in industry, mine and trade organization of Ardabil.

The Literature Review

In the era of knowledge, most service organizations including industry, mine and trade organization have realized that their success is not because of their physical assets, but also it is because of the experience and skills of their employees. These organizations have perceived that their knowledge about the way of doing things is seen as an important asset that like other valuable assets of organization, this property (knowledge) must be managed.

Knowledge management seeks to capture organizational knowledge, aims at its contribution to exploit, use it for achieving organizational goal, and protect and preserve it as organizational asset. With the implementation of knowledge management in any organization, the potential of knowledge within the organization can be identified and shared and it can be available for all people. Therefore, this would lead to the growth of individual staff and to the creation of new knowledge and if this knowledge is used in work processes of organization, learning in the organization would be particularly prevalent (Hassanzadeh, 2007).

Factors influencing knowledge management process have not been well recognized yet. However, quality management is one of the variables affecting the process of knowledge production. Most quality improvement activities require the production of new knowledge for the organization and effort and hard work which is not guided by new knowledge would be still problematic. This conception can be derived from the importance of knowledge production and it highlights that a successful organization must not only manage the quality of the products and its techniques efficiently, but also it should pay attention to professionalizing and applying knowledge management (Anderson, Rungtusanatham, & Schroeder, 1994).

Although the quality management and knowledge management has increasingly attracted researchers' attention, most researchers consider quality management and knowledge management as two distinct fields and independent system management. Despite the

importance of knowledge management within companies, several experimental studies consider its relation to quality management. The main association of quality management with knowledge production includes the connection of knowledge production with conceptualization of quality management, the integration of framework of activities related to quality management and process knowledge, integration of educational model of knowledge production with quality management, management system of qualitative knowledge, relationship between quality management practices and knowledge transfer, surveying the knowledge and quality management in terms of research and development, and data mining survey and qualitative control (Siqing, Qiuhong, & Fan, 2013).

Given the growing importance and role of information technology, in industry, mine and trade organization much attention has been drawn to organizational knowledge production. The industry, mine and trade organization of Ardabil desire to implement knowledge production activities with regard to quality management practices. However, the impact of management practices on the process of organizational knowledge has not been fully studied in this organization.

Ghaneirad, Tolou, & Khosrokhavar (2008) conducted a research titled as the “Factors, motivation, and challenges of knowledge production among scientific elites”. The findings of research revealed that individual and collective patterns of knowledge take a break from each other, knowledge production associates with the challenge related to the lack of formation of sustainable scientific communities, and there are no statistically significant correlations between knowledge production, productivity of people, and between their individual and organizational norms.

Mohammadi (2007) carried out a research titled as “The impact of scientific communications on knowledge production”. Given the importance of this issue, this study investigated the various scientific communications between the faculty members of universities and their impact on their scientific production. The findings showed that the amount and kind of scientific communication of professors and the use of scientific communication tools have impact on knowledge production.

Mehralizadeh (2003) conducted a research named “Comprehensive quality management and education and training”. The results indicated that educational centers such as schools, universities and training centers play an important role in basic training and skill development. However, still many uncertainties exist in the meanings and forms of basic skills that need to be further explored.

O'Neill and Adya (2007) in research on the relationship between psychological empowerment dimensions of staff with knowledge production capacity concluded that between the components related to the sense of meaningfulness of works, the feeling of freedom, the feeling of being effective, and a sense of trust in the organization had a significant relationship with knowledge production capacity. Siqing et al. (2013) carried out a research titled as "The effect of quality management practices on knowledge production in aircraft manufacturing companies in China. The results showed that employee training, employee involvement, product design, comparative evaluation, and the vision of the future had significant direct effect on knowledge production. Also, it could be concluded that some other quality management practices such as senior management, customer satisfaction, qualitative management of resources, qualitative information, and knowledge and benefits had no significant effect on knowledge production.

Knowledge

Knowledge is a public term and in its use, there is no difference between wisdom, intelligence, creativity, etc. A common definition of knowledge refers to practical information. Knowledge can be a mixed experience, values, available information, and systematic attitudes which provide a framework for evaluation and gaining significant benefit from experiences and new information as well as judgment. Knowledge usually forms in the minds of people and it becomes coherent in their minds, in knowledge documents and knowledge repositories, in the work procedures, in organizational processes, and in practices and norms and lead to a decision (Akhavan & Baferi, 2010). Knowledge is a combination of data and information that the experiences, ideas, and skills of specialists are added to it and the result of it is a valuable asset which is used in decision-making.

Knowledge Process

Various types of knowledge process consists of acquiring knowledge, saving, processing, and transmission. In acquiring knowledge, an organization acquires focal and tacit knowledge in the form of data or high-level information. Saving represents that the raw knowledge that we have at our disposal (data and information) should be stored in a place that can be managed, protected, and could be available to others. In addition, raw knowledge in the processing stage appears as valuable organizational knowledge. Processing involves saving, refining, organizing, analyzing, comparing, probing, and variety of techniques. Following this, for the

knowledge to be precise, it should be shared with others and transmission can be active or dismissed. Knowledge can be transmitted through information systems or through personal interaction (Balighi, 2009).

Knowledge Management

Knowledge management is not a new term and in fact, from hundreds of years ago there has been knowledge management that the family business owners or skilled tradespeople used to transfer their professional business completely and accurately to their children and pupils. But in recent decades, definitions, classifications and others have been proposed in connection with knowledge management.

The Concept of Knowledge Management

Haines (2001) refers to knowledge management as a process that is based on four pillars, namely content that is concerned with the type of knowledge; skill that is acquisition of skills to extract knowledge; culture which states that culture of organizations should encourage the distribution of knowledge and information; and organizing which refers to organizing the existing knowledge.

Quality Management

Quality management is defined as a method of management which involves mutual reinforcement principles and each of them is under the auspices of the overall set of methods and specific techniques. It has been shown that quality management is particularly useful for improving organizational performance. Since the preliminary activities of Seraph, Benson, and Shroeder (1989), many studies have focused on identifying the key practices of quality management and have developed analysis tools for application analysis in companies. A total of 45 different and important factors of quality management are developed by 16 researchers and they carried out research in different parts of the world. However, researchers in this field do not have the ability to make a satisfactory comparison of research findings in different countries because of the discrepancies among important factors used in research institutions. In other words, each researcher deal with his own set of key factors. From among 45 various and important factors that have been created by researchers, some factors seem to be the most common factors. Put differently, 4 or more research groups used and developed these important factors in their research. These factors from the highest to the lowest level are as

follows: senior management support, employee training, employee involvement, product design, quality management of suppliers, availability of qualitative information, the use of qualitative information, and comparative evaluation of senior management proceedings as a driver of quality management.

The Study

Figure 1 shows the conceptual model of research.

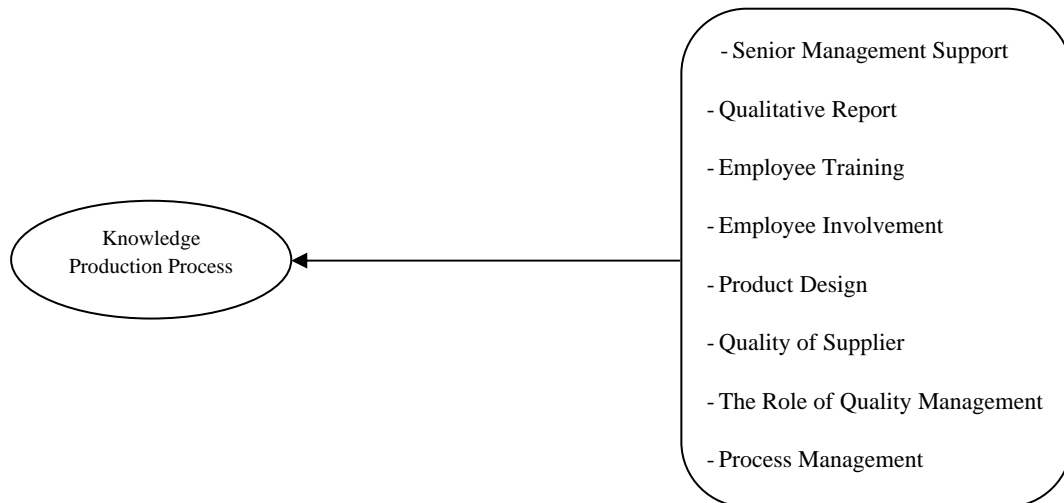


Figure 1. Conceptual model of research

Research Questions and Research Hypotheses

The main question of the study is:

- What are the effects of quality management practices on knowledge production process?

The sub-questions of the present study are as follows:

- What is the effect of senior management on knowledge production process?
- What is the effect of qualitative report on knowledge production process?
- What is the effect of employee training on knowledge production process?
- What is the effect of employee involvement on knowledge production process?
- What is the effect of product design on knowledge production process?
- What is the effect of employee training on knowledge production process?
- What is the effect of quality of supplier on knowledge production process?
- What is the effect of process management on knowledge production process?
- What is the role of qualitative department on knowledge production process?

The main hypothesis of the current study is:

- Quality management practices have effect on knowledge production process.

The following sub-hypotheses guided the study:

- Senior management has effect on knowledge production process.
- Qualitative report has effect on knowledge production process.
- Employee training has effect on knowledge production process.
- Employee involvement has effect on knowledge production process.
- Product design has effect on knowledge production process.
- Quality of supplier has effect on knowledge production process.
- Process management has effect on knowledge production process.
- The role of qualitative department has effect on knowledge production process.

Method

The present study was an applied research and it fitted within the category of descriptive and correlational study. The study aimed to investigate the effect of quality management practices on the process of knowledge production in industry, mine and trade organization of Ardabil. The data was gathered through a survey method. The population of the study consisted of all employees in industry, mine and trade organization of Ardabil which included 197 individuals. Cochran's formula was used to determine the sample size and according to this formula, the number of obtained samples was 125. Simple random sampling used for the sampling of this group. The first stage of data gathering was undertaken using library method and note taking tool. In the second stage of data gathering, field method and questionnaire were used. Two kinds of questionnaires were used to collect data; for assessing the knowledge production process, *questionnaire about knowledge management* was used and the questions related to knowledge production was derived from that. Five-choice questions with the Likert scale (very low to very high) were designed.

For assessing quality management practices, standardized questionnaire of Seraph et al. (1989) came into use and five-choice questions with the Likert scale (very low to very high) were designed. Quality management tool used to identify eight important factors in quality management. To assess the validity of the questionnaire, content validity was applied. This means that questionnaires were given to professors and they were asked to report their ideas about the suitability of the questionnaires for measuring variables. Cronbach's alpha

coefficient was used to assess the reliability coefficient of the questionnaire. Table 1 presents the reliability coefficient of questions related to each variable.

Table 1
Reliability Coefficient of Questions Related to Each Variable

Variable	Cronbach's Alpha Coefficients
Knowledge Production	0.78
Quality Management	0.82
Total	0.80

The collected data were coded based on measurement scales of variables and were analyzed using SPSS software.

Results

Table 2 shows the demographic information.

Table 2
Demographic Information

Variable	Status	Frequency	Percentage
Gender	Male	81	64.8
	Female	44	35.2
Age	Under 30	20	16.0
	30-40	59	47.2
	41-50	33	26.4
	Over 50	13	10.4
Education	Diploma	9	7.2
	Under Diploma	23	18.4
	Graduate Degree	66	52.8
	Master Degree	25	20.0
	PhD	2	1.6

Table 3 represents the results of the univariate regression coefficient.

Table 3
Results of the Univariate Regression Coefficient

Predictor Variable	Non-Standard Coefficients		Standard Coefficients	T	Π
	B	ΣE	BETA		
Quality Management Practices	.211	.021	.680	10.294	.000
Senior Management Support	.892	.134	.516	6.673	.000
Qualitative Report	.525	.140	.316	3.738	.000
Employee Training	.744	.116	.500	6.407	.000
Employee Involvement	.782	.115	.521	6.777	.000
Product Design	.607	.142	.360	4.286	.000
Quality of Supplier	.457	.094	.402	4.870	.000
Process Management	.491	.110	.374	4.472	.000
The Role of Quality Management	.336	.127	.232	2.648	.009

According to the results of Table 3 and since the significance level of test error is less than 0.01, so it can be stated that quality management practices had effect on knowledge production process. Beta coefficients indicated that senior management support (0.51), qualitative report (0.31), employee training (0.50), employee involvement (0.52), product design (0.36), quality of supplier (0.40), process management (0.37), and the role of quality management (0.23) predicted changes in knowledge production process.

Considering the results of the univariate regression coefficient, the main hypothesis is accepted and quality management practices had significant positive effect on knowledge production process. Besides, beta coefficient showed that quality management practices predicted the changes of knowledge production process. In addition, improvement of quality management practices led to the improvement and enhancement of knowledge production among the employees of industry, mine and trade organization in Ardabil.

All sub-hypotheses were accepted. This highlights that according to the results of the univariate regression coefficient, senior management support, qualitative report, employee training, employee involvement, product design, quality of supplier, process management, and the role of quality management had significant positive effect on knowledge production process. Moreover, beta coefficients indicated that senior management support (0.51), qualitative report (0.31), employee training (0.50), employee involvement (0.52), product design (0.36), quality of supplier (0.40), process management (0.37), and the role of quality management (0.23) predicted changes in knowledge production process. And, the improvement of these 8 factors led to the improvement of knowledge production among the employees of industry, mine and trade organization in Ardabil.

Discussion and Conclusion

The purpose of this study was to investigate the effect of quality management practices on the knowledge production process in industry, mine and trade organization of Ardabil. The results of the study indicated that quality management practices had significant positive effect on knowledge production process. Also, senior management support, qualitative report, employee training, employee involvement, product design, quality of supplier, process management, and the role of quality management had significant positive effect on knowledge production process. The results were in the same line with the results of research by Siqing et al. (2013) and O'Neill and Adya (2007) approved their outcomes.

Since the findings revealed that these 8 factors had significant positive effect on knowledge production process, therefore, to increase knowledge production, it is suggested that top-level managers in industry, mine and trade organization directly and actively become involved in activities to improve quality and support quality improvement activities. In other words, they should have supporting and leading role and participate in quality improvement and some managers should offer tentative supports for activities that improve quality.

It is better to collect information about the quality of services from the internal and external customers and suppliers and from major suppliers. Besides, it is suggested to establish a system to measure and analyze quality. Also, industry, mine and trade organization should try to bring into force the identification and training of employees on a regular basis and the identification and training of employees must be planned. Moreover, industry, mine and trade organization should design a program to increase the identification and training of employees.

Empowerment of employees and teamwork practices should be used and it is recommended that the working groups should have the authority to create effective teams for improving quality. In addition, the managers are suggested to support the empowerment of employees and teamwork. Products and services and processes need to be designed to satisfy the needs and expectations of internal and external customers. Goods and services for internal improvements must be controlled and a variety of innovative and effective practices should be used to get feedback from customers for all organizational functions. Put differently, effective systems should be used for getting feedback from all customers for the basic functions of the organization. Following this, the needs of customers should be specified through possible processes rather than using a regular procedure. Also, petitions and complaints of customers should be considered. Long-term goals should be defined to improve quality throughout the organization as part of a comprehensive strategic planning process and the overall objectives of the organization should include the elements of quality improvement.

This study is also limited because the sample was comprised of only employees in industry, mine and trade organization who were from Ardabil; therefore, it may not be generalizable to other population and future studies should extend this work. The effect of management practices on other components of knowledge management should be discussed and using tools for recording observations and Delphi interview technique are further

suggestions. Finally, it is recommended to take advantage of experts of industry, mine and trade organization in the area of data collection.

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