

CORRELATION BETWEEN KNOWLEDGE MANAGEMENT AND STANDARD ISO 9001

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Abstract: Standard ISO 9001: 2015 brings some novelties which caused changes in the work of already certified organizations. Except of changes in terminology and structure of the standard, there has been a substantial change which opens up the possibility for the realization of effective quality management system. One such change is the introduction of the new standard's requirement "7.1.6 Knowledge", which emphasizes the obligation of establishing, maintaining and updating the knowledge of the organization.

Knowledge has become the main driving force in society and a major success factor. Knowledge of individuals integrated into a particular entity or organization, represents the highest value and intellectual capital of the organization. Since the knowledge is the main factor of organization's success, it is necessary to adequately organize knowledge management in order to provide sustainable development of the organization. Knowledge management is a broad multidisciplinary and complex field that is constantly evolving and represents an essential driver of innovation in organizations.

In contrast of previous version of the standard, ISO 9001: 2015 has more requirements focused on providing knowledge and information, through which can be made the integration of knowledge management. Thus, the paper is focused on research of correlation between standards ISO 9001: 2015 and knowledge management. Accordingly, the paper gives an overview of identified techniques and methods of knowledge management and analysis of their correlation with the requirements of ISO 9001 standard.

Keywords: KNOWLEDGE MANAGEMENT, STANDARD ISO 9001:2015

1. Introduction

According to Ackoff, the content of the human mind can be divided into 5 categories:

- Date – unorganized and unprocessed static fact
- Information – has meaning, purpose, relevance
- Knowledge – useful information gathering
- Understanding – connects and synthesizes knowledge
- Wisdom – state of mind which comprises the treatment of conscience and morality, the code of ethics, etc.

The ratio of these categories on the basis [1] is shown in Fig. 1.

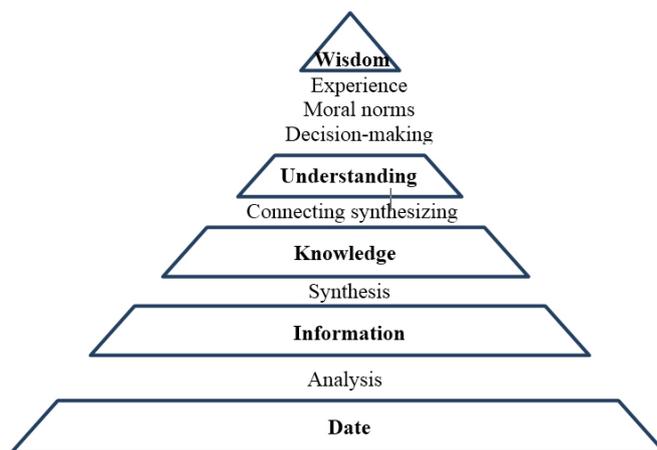


Fig. 1 The path from data to wisdom.

The fact is that from all of the above emphasized categories, the most difficult is to make a clear distinction between information and knowledge because these two categories are mutually intertwined. This is because it is debatable whether the segments of recorded information actually are "knowledge" and whether the recorded knowledge contains much information.

Knowledge is one of the terms that are difficult to define. Knowledge can be defined as the volume of information, observations or understanding that has a personality.

The most appropriate definition of knowledge is: *Knowledge is data plus "knowledge" about the meaning of these data*, i.e. knowledge is always associated with the procedures for its use.

Knowledge is intangible, dynamic and difficult to measure, but without it organization cannot function. The basic division of knowledge is as follows:

- Tacit knowledge. Represents inarticulate knowledge that is largely personal, experiential, specific context. Tacit knowledge is variable, increasing and constantly getting new forms, in line with recent experience of its owner. The basis is for innovation and creative processes. Methods of transmission are: mentoring, apprenticeships, communities, practices.
- Explicit knowledge. It can easily be written and codified. Objectively it exist, it can be codified, clearly and formally expressed and documented and is easy to transfer, sharing and transferring.

Knowledge has become the main driving force in society and a major success factor. Knowledge of individuals integrated into a particular entity, i.e. business system, represents the highest value, and intellectual capital of the organization. Knowledge is actually the base for the realization of all the processes in the organization, therefore, the aim of knowledge management is actually the construction and use of intellectual capital in an efficient and effective manner.

Standard ISO 9001, in the new edition of 2015, provided the knowledge more importance by assigning it a special point 7.1.6. Knowledge of the organization. This requirement was introduced to protect the organization from the LOSS OF KNOWLEDGE (staff turnover, lack of knowledge sharing ...) but also to encourage organizations to acquire new knowledge. In direct correlation with the knowledge is associated and the standard requirement 7.1.2. People, 7.2 and Competence and 7.3 Awareness.

In accordance with the foregoing, the aim of this paper is to highlight the importance of the categories of knowledge and management skills and to determine their correlation with the standard ISO.

2. Knowledge management

More than 40 years 80% of the employees participated in the production (directly or indirectly). At the present time only 20% of employees are involved in the production. Thus, the organization uses on average 20% of the available knowledge while about 80% of knowledge in the organization is unstructured.

In addition to the basic division of knowledge to tacit and explicit, knowledge is still divided into individual and collective knowledge. Individual knowledge is part of the organizational knowledge that exists in the minds and skills of individuals. It is autonomous in the application and transferability between individuals.

Collective knowledge - "organizational memory" or "collective thinking of organization," depends on the way in which knowledge is spread and shared among members of the organization. It's accumulated in the organizational rules, procedures, routines, and common standards that define ways of solving problems in practice, and the interaction between members of the organization.

The fact that knowledge is the main factor of success of the organization that's why is necessary to manage adequately with the individual and collective knowledge in order to provide sustainable development of organization.

Knowledge management is a broad multidisciplinary and complex field that is constantly evolving and therefore there are different interpretations of its meaning. Here are given some of the older definitions of knowledge management that are still in use nowadays:

According to Birkett (1995) knowledge management represents bringing of unutterable knowledge to the surface, their consolidation into forms that are more accessible and promote their continued creation.

Davenport 1994, defines knowledge management as a process of abstraction, distribution and effective use of knowledge.

Basic components of knowledge management are:

- People. The most important and the most difficult challenge of knowledge management implementation concept is to prepare the organizational culture of (values and behavior)
- Processes. Should be adapted in a way to support the employees in creation, division and knowledge application.
- Technology. Should be adapted to people and processes of creation, division and knowledge application.

As knowledge is recognized as increasingly important "asset" of the organization's knowledge, thus that knowledge of organization must be formalized, distributed, shared and applied. Thus, the existence of knowledge in the organization is not enough that the organization becomes a highly-competent, but it is necessary to establish an effective system of knowledge management.

There have been proposed many models of knowledge management system. In Figure 2 on the basis of the paper [14] is shown a model that is in consistent with PDCA cycle.

As the PDCA cycle is the basis of ISO 9001 standard, so and the model and system of knowledge management is displayed through this cycle on the basis of five processes. Planning and organizing of knowledge are the segments of the phase P (Plan), Transfer of knowledge belongs to a phase D (Do), Application of knowledge belong to a phase C (check) and a Measurement and Analysis belong to phase A (Act). In each of the processes are defined and key activities that define them.

In knowledge management are defined the following principles [2]:

- 1) Knowledge management is expensive but irrelevant

- 2) Effective knowledge management requires a hybrid combination of people and technology
- 3) Knowledge management is in the hands of top management
- 4) Knowledge management requires knowledge managers
- 5) Knowledge management provides greater benefits through the plan than through the model
- 6) Sharing and use of knowledge is often an unnatural act
- 7) Knowledge management means improving of working processes that are based on knowledge

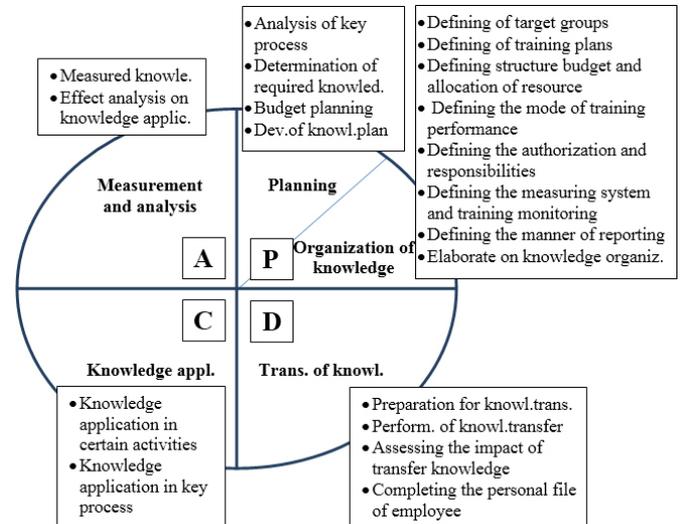


Fig. 2 The cycle of knowledge management.

The knowledge management uses a variety of multidisciplinary techniques and approaches to manage with the knowledge. Some of the most popular techniques and approaches are [3]:

- Professional groups/Asynchronous communication (e-mail, bulletin board / advertising, index text and alerts, discussion themes);
- Synchronous communication (instant messages / documet sharing, application and screen sharing, video i audio conferencies);
- Colaborative services (calenders and schedules, task management, voting and evaluation monitoring, labor flows);
- Management of documents and content;
- Engineering knowledge;
- Classification;
- Mapping;
- Detection of knowledge (data warehouse, data mining, expert systems);
- Depot records of learned lessons and the best practices;
- E-learning, training and mentoring;
- Locator of experts/Organizational;
- Yellow pages;
- Management of changes, agent of changes, BPR culture of change, incentives, leadership;
- Intellectual property/Ownership.

All of the above mentioned methods and techniques by the character can be classified to the linkage and the collecting. [4] Gathering techniques connect people with the information, and the other connecting people with people who have specific knowledge. Basically all the knowledge of management techniques are enabled thanks to the development of information technology.

3. Relationship of knowledge management and ISO 9001 standard

The succes of the business system can be expressed on the basis of the four key factors:

- knowledge,
- quality,

- competence and
- continuity.

Neglecting other influencing factors, that can be treated as 4 mentioned functions, the success is defined as:

$$\text{Success} = f(\text{knowledge}, \text{quality}, \text{competence}, \text{continuity})$$

The 4 mentioned factors, as a dependent variable, present (Figure 3):

- Precondition of success – Knowledge,
- Guarantee of success – Quality,
- Ensuring of success – Competence and
- Sustainability of success – Continuity.

In order to meet all the challenges that today is facing a business system a prerequisite of success, respectively the basis of success is the knowledge.

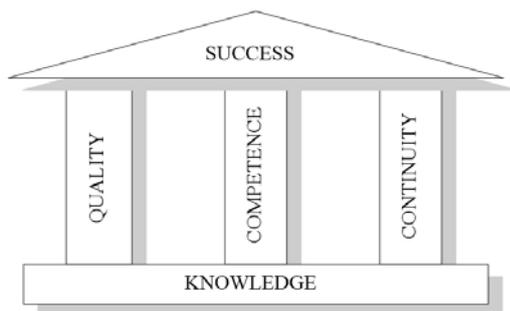


Fig. 3 Success.

One of the principles of quality management is "**Decision-making based on facts.**" Analyzing this principle, from the standpoint of his expedient fulfillment, are revealed two aspects of knowledge.

The first aspect relates how to provide a fact. In this case, under the fact is implied true detailed information. So this is information that is timely and topical, relevant, accurate and reliable. Information is itself a resource at which basis is the data. The data itself is nothing until it is put into context. Thus, knowledge of how to put the information into context on the basis of which leads to a fact presents the first aspect.

The second aspect is the knowledge necessary for decision-making. And in addition to providing adequate facts, unless there is a sufficient quantum of knowledge of decision-makers, there is a risk of making the wrong decision.

The requirements of ISO 9001 standard that are in direct correlation with knowledge are:

- In item 4.1, "Understanding the organization and its context," pointing out that "Understanding the Internal context can facilitate consideration of issues relating to values, culture, knowledge and organizational performance".
- Item 16.7 is specifically oriented to the knowledge of the organization. In the previous standard the knowledge is only mentioned in item 6.2.2. The work environment due to the importance now got special item.
- In Item 7.2 Competence is associated with knowledge of the organization but for expressing the importance of this item is included separately, which was not the case in the old version of the standard.
- Item 7.3 Consciousness is also associated with the knowledge of the organization because it requires the organization to develop the awareness of individuals in relation to the contribution to the effectiveness of the quality management system, including the benefits of improved performance, as well as the consequences of non-compliance with the requirements of the quality management system.

- Item 7.5 refers to the documented information which clearly defines how information is created, stored, controlled, recorded, distributed, delayed Although between the information and knowledge is the fine line yet in ISO 9001 standard these two themes are clearly separated.
- Item 7.1.6. **Knowledge of the organization** is the only item of the standard ISO 9001: 2015 without any equivalent sub-items in the preceding standard and indicates the commitment of the standard of knowledge as one of the important resources of an organization.
- Item 7.1.6 defines **three imperatives** related to knowledge as a resource of organization, as follows:
 - 1) the necessity to continuously measure and determine overall knowledge that is necessary for the performance of business processes in the organization, in order to increase or retain the necessary level of quality products and services;
 - 2) this knowledge must be maintained at the desired level and to make available at the organization level;
 - 3) depending on the available knowledge, the organization has to design ways to access additional knowledge in order to innovate the existing.

Well, the standard's requirement 7.1.6, in terms of knowledge as a resource, in some way directly promotes the use of techniques and methods of knowledge management for the fulfillment of those imperatives. Unlike this item, item **7.6. Documented information** contains all the elements of a documented management system, which is one of the tools of knowledge management. Also, within the item **9 Evaluation of performance**, there is a sub-item **9.1.2 Customer satisfaction**, which requires that the organization must establish **methods** for preparing, monitoring and review of information on user satisfaction with products and services. The methods and techniques that can be used to fulfill a request by the mentioned items of the standard at the same time are and the methods and techniques in the field of knowledge management process. In Figure 4 indicates the relationship between the ISO 9001 standard and Knowledge Management.

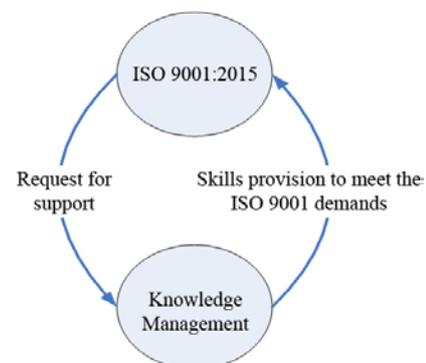


Fig. 4 The relationship between the standard and knowledge management.

Standard ISO 9001 requires from organizations the establishment of knowledge management as a support process, i.e. support through the application of techniques and methods of knowledge management. In the context of item **7.1.3. Infrastructure** requires the organization to provide the equipment, including hardware and software, and information and communication technologies that are the basis for the application of methods and techniques of knowledge management. In the other direction through the application of techniques and methods of knowledge management are provided the knowledge and information necessary to meet the requirements of the standard in terms of smooth functioning of the business processes of the organization, achieving the goals of the organization and the achievement of quality in the organization.

Unlike previous versions of the standard, ISO 9001: 2015 standard has broader requirements in terms of providing knowledge and information and through which can be made with the

