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Development of Knowledge Model for Effective Implementation of Quality Management Programs

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Abstract. *Quality of products and services is a major factor in any organisation's viability and competitive advantage and it is necessary that all levels and functions in organisation receive training in the quality disciplines. However, literature analysis indicates that many quality improvement programmes are ineffective. By using knowledge management practices, organisations can increase the effectiveness of quality management training. Knowledge management processes allow organisations collecting, analysing, storing, disseminating and using information that is relevant to the organisation. This article discusses knowledge management processes for organisational learning mechanisms, which can contribute to more successful planning and implementing of quality management programmes. Six-phase process based explicit knowledge management models are identified in the analysis as the basis for successful preparation and implementation of quality programmes. In this model, the processes are implemented in sequence for development and implementation of quality programme in an organisation.*

Keywords: *quality management, knowledge management, ISO 9000 standards, quality programmes.*

Raktažodžiai: *kokybės vadyba, žinių vadyba, ISO 9000 standartai, kokybės programos.*

Introduction

Knowledge management practices and paradigms will continue to evolve in the twenty-first century. Since 1990s the role of knowledge and the learning organisation has grown as the intellectual capital became central to business value and growth. Modern firms are enjoined to manage learning and its result – knowledge at the organisational level to ensure the growth and full exploitation of knowledge capital. Knowledge management emphasizes on cultural and internal operational changes in

organizations. The identification of changes and their rapid implementation is extremely important and relevant under the conditions of current global crisis. The investigations of Atkočiūnienė (2010) emphasizing that organisation reaching for competitive success needs to promote knowledge renewal, create and model knowledge management processes [2]. This helps developing individual creativity, organisational knowledge and experience into organisational work, creation of improved products and services. Terziovski *et al.* (2000) suggested that the success of total quality management is dependent on organisation's ability to learn, to absorb, to adapt and to apply changes and integrate them throughout the organisation [16]. The investigations of Ruževičius (2005) also show that there is a connection between knowledge management and quality management and knowledge management processes can be used for solving quality problems [14]. Business and knowledge management activities should be related in the way enabling to drive maximum profit with the use of minimum costs, rendering advantage not only to the market but also to society-oriented business vision.

There are many cases of quality improvement programme failures documented in the literature. Shih and Gumani (1997) identified that many quality management programmes failed because of the lack of integration between these and other functions of the organisation, so they were seen as independent and isolated [15]. The investigations of Clegg *et al.* (2010) also show that training of quality is often ineffective. Training needs to focus on the initial understanding of tools, the endorsement of classical critical success factors and the subsequent deployment of them within a suitable methodological framework [3].

The mixed success of quality programmes as reported in the literature provides the motivation for this study. This article may contribute to an understanding of whether lack of learning is inhibiting the success of quality programmes. The purpose of the research was to find out how quality management training can be practiced more effectively.

The current research is based on two methods of qualitative research: analysis of literature and review of quality management and knowledge management practice.

Involvement of organisational members

People at all levels are the essence of an organisation and their full involvement enables their abilities to be used for the organisation's benefits. Organisations need to pay more attention to organisational members affected, understanding the willingness to change and cultural transformation of their behavior and include them in the process of planning changes. There are many cases of knowledge management (learning) failures documented in the literature, often attributed to resistance to changes by organisational members. In order to reduce resistances to changes, organisations should focus on what organisational members want rather than what the organisations are delivering. When satisfied with knowledge management initiatives, organisational members will voluntarily participate in diverse knowledge processes. Effective knowledge management must be peoplefocused, as success is determined by full commitment of the organisational members, and effectiveness of actions results from

knowledge used to handle situations. Therefore, an organisation should lead a well managed change programme for implementing knowledge management, in response to satisfying the requirements of organisational members. Now more attention is paid to focusing on organisational members' satisfaction with knowledge management as an indicator for direct measurement of knowledge management performance. Grossman (2006) also states that the effective way to measure knowledge management is to communicate with organisational members to get their opinion about the impact of knowledge management initiatives [4].

Quality projects in the programme are sometimes too internally focused. The implication is that practitioners should be aware that projects need to be driven either by the voice of the external customer or by an organisation's key stakeholders [3].

Typically, employees receiving a quality-training are from different functional areas in the organisation and thus have different vested interests and learning objectives. That is, a training audience is typically heterogeneous as opposed to homogeneous. Therefore, in such situations, training must be tailored to accommodate the unique needs of the various elements of the training audience, and to correctly ascertain whether the employees in each segment (or role) have learned what they need to know to directly apply in their specific job.

Public service organisations have different mission objectives to private sector organisations and the different cultural and contextual values need to be considered this needs to accounted for when selecting quality management programme objectives [3].

Evidence of learning management leadership

Upper management may ensure that all employees are made aware of what quality means to the organisation by showing their own commitment to quality initiatives. When upper management spends time on quality activities, it provides evidence leadership that inspires others to do their share. Knowledge management leaders may act as role models through their ethical behaviors and their personal involvements in planning, communication and coaching. Some upper management groups can be chosen to be highly visible in the quality process by leading quality training. In such cases, managers at a variety of levels personally conduct some of the managerial training for their subordinates.

A further form of evidence is upper management quality improvement teams. Each team, consisting solely of upper management members, addresses a problem which requires attention at its level. Examples include the effectiveness of product development process, quality of decision making in selecting new product managers, and administrative aspects of high warranty costs. The visibility of upper management taking such training and then conducting such projects sets an example for other levels to follow.

Upper management should act as shapers and coaches. As a coach, it should help when asked. Middle management should not only run its area of responsibility, but

work as a group to integrate all parts of organisation [6]. In addition, it must support the work force by eliminating obstacles to progress.

The work force is the primary producer of the output for customers. Its closeness and knowledge about its work means that it should use its knowledge to determine how the work can best be done.

Learning environment

Organisational learning is operationalised through organisational learning mechanisms, which are the institutionalised structural and procedural arrangements that aid the learning process. Such mechanisms allow organisations to collect, analyze store, disseminate and use information that is relevant to the organisation. This mechanism enables the experiences of individual organisational members to be analysed and shared by other organisational members. The experience becomes the property of the entire organisation through distribution of lessons learned to relevant units or trough changes in standard operating procedures.

Total quality management (TQM) has long been a major quality management practice. Knowledge management (KM) has gained popularity in organisations recently. In addition, innovation has also received considerable attention as critical to securing sustainable competitive advantage in the marketplace. Hung *et al.* (2010) examined the relation between knowledge management initiatives, total quality management and innovation performance. It was found that knowledge management is positively associated with both total quality management and innovation performance and that total quality management acts as a mediator between knowledge management Ni and Sun (2009) investigated the relationship between organisational learning, continuous improvement and performance improvement from an evolutionary perspective [11, p.1048]. The results can be summarized as follows. Firs, continuous improvement directly contributes to performance while organisational learning does not contribute directly. Second, continuous improvement and organisational learning do enhance each other, but there is a time lag. Well-established learning capability contributes to continuous improvement, and continuous improvement in return supports current organisational learning. The relationship is evolutionary like rolling a snowball. The result suggests that companies have to be patient when implementing organisational learning and also incorporate organisational learning with continuous improvement or other problem-oriented programmes.

Performance measurement system

Oliver (2009) argued that for a quality programme to be successful the organisation must have in place both the commitment to learning and the performance measurement system that is flexible enough to meet the changing needs of business environment [13, p.550]. Without an appropriate performance measurement system, quality programmes and improvement activities can fail. In reality it could be any system to monitor and

assist organisational learning practices. Performance measurement system may be structured to support the learning environment, management decision making, facilitates rapid and effective learning, and enables the acquisition and development of information, knowledge and understanding, provides the feedback for driving the improvement effort. It is the continuing process of evaluating performance and taking corrective action when necessary and enabling the organisation to mountain high quality process, and also to bring processes under control in order for improvements to be made.

Using explicit knowledge for programmes designed for the implementation of ISO 9000 quality management systems

Nonaka and Takuechi (1998) conceptualized that the knowledge in organisations can be identified as tacit or explicit [12]. Tacit or explicit classification of knowledge offers a simple and widely understood classification. Tacit knowledge refers to the experience, intuition, judgment and heuristics that one develops overtime which is embodied in the knower. Tacit knowledge can not be easily transferred or externalised. It takes place through a long process of deep learning, apprenticeship, socialisation and mentoring. Explicit knowledge, on the other hand, refers to knowledge that is recognised and embodied in the various organizational routines i.e. manuals, procedures, instructions, standards, protocols etc. This type of knowledge can be easily acquired and transferred. As the role of knowledge and the learning organization has grown, the tacitness and explicitness of the knowledge in the organisation will become a key strategic consideration in shaping the competitive strategy [1]. For quality management programmes and quality models more useful and more popular is explicit knowledge.

Successful implementation of a quality management system requires appropriate programme formulation. The programme related to quality management systems implementation should consider the right activities from the early stages of their lifecycle, in the right order and with the involvement of right resources. In this context, Lin and Wu (2005) identify the most important activities within ISO 9001:2000 processes which can facilitate knowledge flow and suggest a knowledge creating model for ISO 9001:2000 that an organisation can use to gain the knowledge needed to enhance quality and performance [8]. It also provides a ready framework for ordering and structuring an organisation's knowledge.

Abdullah and Ahmad (2009) examined the fit between values underpinning in the ISO 9000 standard and selected managerial and organisational factors [1]. It is postulated that more mechanistic and explicit knowledge based organisations can implement programmes for ISO 9000 quality systems easily while the more organic and tacit knowledge based organisations will experience tensions arising from lack of fit. Hence, the standard will work best in more mechanistic and routine knowledge based settings.

The ISO 9001:2008 standard explicitly requires that all processes and procedures be established, documented, implemented and maintained. The quality manual

symbolised the institutionalised system of control of the processes by which the requirements of the customers are met. Many studies have positioned that quality assurance including ISO 9000 certification tends to result in greater formalization and explicitisation. Explicitisation enables knowledge transferability and ensures know-how is routinesed an embedded in the actions and practices for carrying out day-to-day quality management system by way of training programmes [8]. In fact, in high tacit knowledge organisation, the implementation of programme for ISO 9000 quality system is inherently more difficult as much of the system cannot be described or effectively documented. Without explicit documentation, the quality system is deemed weak.

The impact of the standard on organisational performance is greatest in organisations, which mainly utilise explicit knowledge and is weakest in organisations, which mainly utilise tacit knowledge [1].

Some obstacles referred in literature to achieving a successful quality programme

One of the essential ingredients of a broad-scope quality programme is extensive amount of training. Experience in training has identified the reasons for failure of some training programmes:

Lack of an infrastructure for quality. The information and communication technology infrastructures, as well as data collection and measurement provide foundation to support the alignment of goals in the whole quality programme. With other major activities, management has successfully delegated responsibility but only after evolving mechanisms that include clear goals, plans, organisational mechanisms for carrying out the plans, budgets, and provision for recognition and rewards. In contrast, these same elements are usually vague or missing with respect to quality.

Failure to understand the skepticism about the 'new quality programme'. Perhaps the greatest cost an organisation can experience as a result of failure is the loss of morale or an increase in cynicism among employees. Many people have seen previous quality programmes sink quietly into oblivion. Unfortunately, the skepticism is not vocalised. Those organisations that have achieved or excided the desired quality outcomes have embedded quality into the organisation's culture. This has been assisted by management, ensuring that all employees are made aware of the meaning of quality to the organisation and by showing their own commitment to the quality initiatives [13, p.555]. Participation of line managers in designing training is extremely important. Without this participation, training is techniqueoriented rather than problem and results oriented.

Failure to 'start small' and learn from pilot activities. There is a great need to select the correct tools for a particular quality project and to realise that they will alter with the size and complexity of any particular project. The implication is that an evident lack of practical experience in the field suggests there is a need to create a 'road-map' style guide to steer inexperienced users into making the right choices. This is especially apparent in small and medium sized organisations [3, p.194].

Sometimes, in a haste to achieve sizable results rapidly, the small pilot phase is omitted; instead, massive training takes place with the expectation that the troops can then simultaneously advance on all fronts. This does not work. A much better alternative uses a small number of pilot projects, with the scope of each project carefully defined. Perhaps the most common error in quality projects is failure to limit their scope to a digestible bite. People quickly grow tired of projects that seem to take forever.

Reliance on specific techniques as the primary means of achieving quality goals. Examples of such techniques are the statistical process control, quality cost, quality circles, quality function deployment, etc. All of these are valuable and often necessary, but they are techniques that address only specific parts of the problem. The technology of quality, particularly statistical methodology, can be mystifying to some people. Many benefits are possible if we emphasize simple language and graphical techniques.

Clegg *et al.* (2010) investigations show that many quality tools are not known or understood well and that training has an important role in raising their awareness and making sure they are used correctly [3, p.195]. In general, the initial definition of quality problem and the classification and measurement of a programme's success are both highly subjective and difficult issues. These findings imply that more standardization of practice across the profession would be beneficial. The study also implies that there are many points still to be addressed if quality management is to maximize its full potential; many of these revolve around the accurate measurement and selection of programmes, the comparison and declaration of delivered benefits and the coast of resources consumed to achieve them. Addition training needs to focus on initial understanding of tools, endorsement of classical critical success factors and subsequent deployment of them within a suitable methodological framework. Training programmes are a failure if they do not result in a change of behavior. Applying these lessons can help preventing such failures.

Necessity to provide training at the time it is used. In too many cases, training is given to a large number of personnel who have little or no opportunity to use it until many months later. A much better approach schedules training for each group at the time it is needed [10].

Organisational learning mechanisms for implementation of quality programmes

Literature analysis shows that for quality improvement programmes, in particular those associated with the requirements of the ISO 9000 standard, explicit knowledge is more useful. Learning management leadership, involvement of employees, setting of objectives and planning, infrastructure, development and improvement of learning process, measurement of learning performance are very important for successful implementation of quality programmes. Six-phase process based explicit knowledge management model is identified based on literature analysis as the basis for successful preparation and implementation of quality programmes (Table 1).

Table 1: **Six-phase process based explicit knowledge management model for the implementation of quality programmes**

No.	Process phases	Necessary activities	Control and measurement indicators
1	Investigation of international customers' needs and expectations	Building two-way communication channel and internal marketing of international customers' needs and expectations	Determines how well an organisation determines needs and expectations of internal customers with the aim of formulating a learning management strategy
2	Learning management leadership	Involvement of leaders in planning, communication and commitment of a quality programme	Determines key aspects of learning management leaders' responsibilities in respect of the way that leaders set goals and target performances and communicate with all levels of related learning management personnel
3	Planning for learning	Setting of objectives of a quality programme and formulating action plans to guide the implementation at the relevant levels in an organisation	Determines how well an organisation establishes learning management objectives and how well it converts its objectives into action plans
4	Establishing infrastructure for learning	Design and improve workplace for learning process. Establishing infrastructure for data collection and measurement	Determines how well an organisation ensures quality and availability of needed knowledge for internal customers and systematically integrates data and information for tracking daily operation of learning performance
5	Management of learning process	Development and improvement of learning process	Determines how well an organisation formulates people-oriented knowledge processes for conversion between individual knowledge and organisational knowledge, in order to enhance continuous learning at the relevant levels
6	Learning performance (focusing on results and creating competitiveness)	Measurement of learning performance	Determines how well an organisation evaluates learning process performance and uses evaluation results to set priorities and targets improving learning process

In this model, the processes are implemented in sequence for development of a quality programme in an organisation. Internal customers are the final arbiters of how well organisations implement their quality programmes. Organisations may focus on systematic communication with internal customers and act quickly on their needs. The success of an organisation's quality programme increasingly depends on the leadership. Leaders may act as role models by their ethical behavior and personal involvement in planning, communication and coaching [9, p. 457]. Ongoing quality programme implementation strategy development involves performance goals and action plans that reflect the importance of the quality improvement activities. It is necessary to understand the necessity of participation of line managers in planning and designing of training. Without this participation, training is techniqueoriented rather than problem and resultsoriented. Establishing infrastructure for learning provides foundation to support the alignment of goals in order to satisfy internal customers' needs and expectations and implement programme goals at all organisational levels. Continuous development and improvement of learning process helps organisations communicating customers' requirements, monitor actual knowledge management performance, and make adjustment in prioritising and reallocating resources.

Performance measurement process is extremely important for successful implementation of a quality programme. A well-structured performancemeasured process provides the linkage between strategies and actions. The links are established by the performance goals developed to encourage employee behavior to meet the organisation's objectives and facilitate and induce quality learning by incorporating goal setting feedback as an essential component of the system.

Conclusions

1. Quality management has become recognised as one of the key strategies for organisations to improve their productivity and internal competitiveness and thereby meet the demands of customers. However, the literature reports mixed success of quality management programmes. The findings suggest that for a quality program to be successful the organisation must be committed to learning and adopt supportive knowledge management model flexible enough to meet the changing needs of the business environment. Successful implementation of a quality management system according to ISO 9000 standard requires appropriate programme formulation. The ISO 9001:2008 standard explicitly requires that all processes and procedures be established, documented, implemented and maintained. For this purpose, explicit knowledge is extremely useful. Explicit knowledge refers to knowledge that is recognised and embodied in various organisational routines, i.e. manuals, procedures, instructions, standards, protocols etc. This type of knowledge can be easily acquired and transferred. With regard to quality management programmes and quality models, explicit knowledge is more useful and more popular.

2. Involvement of organisational members is very important for successful planning and implementation of a quality programme. Satisfied with knowledge management

initiatives, organisational members will voluntary participate in diverse knowledge processes. Now more attention is paid to focusing on organisational members' satisfaction with knowledge management as an indicator for direct measurement of knowledge management performance.

3. The success of an organisation's quality programme increasingly depends on the leadership. Knowledge management leaders may act as role models through their ethical behavior and personal involvement in planning, communication and coaching. When upper management spends time on quality activities, it provides evidence leadership that inspires others to do their share.

4. The main obstacles to achieving a successful quality programme are also lack of necessary infrastructure for learning; reliance only on lecture method of training or only on specific techniques as the primary means of achieving quality goals; underestimating precisely the skepticism about the 'new quality program'.

5. Six-phase process based explicit knowledge management model is identified based on analysis as the basis for successful preparation and implementation of quality programmes.

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Žinių vadybos modelis efektyvesniam kokybės gerinimo programų įsisavinimui

Anotacija

Organizacija, siekdama konkurencijos sėkmingumo, turi didinti organizacijos darbuotojų gebėjimus greičiau reaguoti į rinkos poreikius, gerinti organizacijos veiklos, produktų ir paslaugų kokybę, tačiau literatūros analizė rodo, kad dažnai kokybės gerinimo programos nepasiekia juose numatytų tikslų. Šio tyrimo tikslas buvo rasti būdus, kaip efektyviau įgyvendinti kokybės gerinimo programas. Tyrimai parodė, kad panaudodamos žinių vadybos patirtį organizacijos gali padidinti kokybės gerinimo programų efektyvumą. Žinių vadybos procesai padeda organizacijai geriau analizuoti, parengti ir perimti aktualią organizacijos darbuotojams informaciją. Siekiant sėkmingesnio kokybės gerinimo programų įsisavinimo, organizacijai tikslinga pasirengti žinių vadybos mechanizmą, kuris būtų pakankamai lankstus ir lengvai pritaikomas įvairiomis kintančiomis veiklos sąlygomis. Straipsnyje pateikiamas analizės pagrindu parengtas šešių fazių žinių vadybos modelis. Modelyje nuosekliai išdėstyti procesai, kurių reikia laikytis rengiant ir įgyvendinant kokybės gerinimo programą. Prieš rengiant kokybės gerinimo programą būtiną išanalizuoti organizacijos darbuotojų mokymosi poreikius. Organizacijos vadovai turėtų asmeniškai dalyvauti planuojant programą ir pageidautina, kad dalyvautų apmokant darbuotojus. Turi būti aiškiai apibrėžti kokybės gerinimo programos tikslai ir jų pasiekimo planai. Į planavimo procesą būtina įtraukti vidurinės grandies vadybininkus, nes jie geriausiai pastebi darbuotojų žinių trūkumus. Būtina rimtai vertinti dalies darbuotojų skeptišką požiūrį į mokymų programą ir reaguoti į jų pastabas. Labai svarbu sėkmingam kokybės gerinimo programos įsisavinimui yra mokymosi rezultatų matavimas ir analizė bei grįžtamojo ryšio su programos dalyviais nuolatinis palaikymas.

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