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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

The house of competence of the quality manager

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Abstract: In modern organizations the work of the quality manager is varied and complex. Therefore, what common attributes should characterize an exemplary quality manager? A conceptual model has been developed, entitled *The House of Competence of the Quality Manager*. The model presents important different attributes for the role of quality manager. This model can be used by quality managers who wish to broaden their understanding of the competence needed in their work and to define their profession. The model was developed through a four-step approach, beginning with a review of the rather scarce literature on the necessary attributes of a quality manager. This was followed by work in a small focus group of quality practitioners, which led to a survey questionnaire being sent out to a larger group of professional quality managers in Iceland. The final step was the classification of the attributes as knowledge, skills, or competence. The results of this survey give a good indication of what attributes are desirable and their relative importance.

Subjects: Quality Control & Reliability; Operations Management; Supply Chain Management; Leadership; Human Resource Management

Keywords: quality manager; attributes; competence; ISO 9001:2015; EQF framework

1. Introduction

The role of the quality manager is quite different from one organization to another but in general, it has to do with ensuring that the products and/or services delivered by the organization are fit for purpose and meet both internal and external stakeholder requirements. These requirements primarily stem from customer expectations, legal compliance, and adherence to standards of excellence. The quality manager achieves this, firstly, by co-ordinating the activities required to identify and determine the necessary quality standards; and secondly, by co-ordinating the activities

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PUBLIC INTEREST STATEMENT

In this article, we shed light on the important role of a quality manager in an organization and describe the most important attributes a person—or a team—needs to possess in order to fulfill this role. Most organizations base their existence on meeting the demands of their customers. In order to do so, they must maintain consistency in what they do and how they operate. This is the subject of quality management, and in this paper, we focus on the common attributes that should characterize an exemplary quality manager. We present a conceptual model, entitled *The House of Competence of the Quality Manager*. The model can be used by quality managers who wish to broaden their understanding of the knowledge, skills, and competences needed in their work and to define their profession.

required to ensure these standards are met. The role, therefore, typically involves a lot of communication with other managers and staff throughout the organization to ensure that there is a proper quality management system in place and that it is functioning appropriately. Performance monitoring and measurement, including data capture, analysis, and reporting, as well as the provision of training, tools, and techniques, are some of the key features of a quality management system (International Standards Organization [ISO], 2015). The role can also involve establishing and monitoring quality standards applied to external suppliers. The general description above is in good accordance with the topics used as a reference in the certification scheme for “Manager of Quality” by American Society for Quality [ASQ] (2014).

A general long-term trend that has been recognized by some authors (e.g. Elg, Gremyr, Hellström, & Witell, 2011) is a gradual shift from the role of a quality manager as an exclusively inspectorial role to an integrated managerial role. Appointing someone in the role of the “management representative” was mandatory in earlier versions of the ISO 9001 standard (ISO, 2008), to perform certain tasks in establishing and maintaining a quality management system. The way this position functioned varied between organizations, depending mostly on how senior executives understood the requirement. Rogala (2016) concluded that there was a need to identify the personal traits and competence required for the role of management representative. However, this requirement is not included in the 2015 version of the standard (ISO, 2015) and instead, the standard calls for more leadership and commitment from top management regarding the quality management system.

Within the broad description of the role of the quality manager, there are some variations in the roles that different quality managers are tasked with performing. Some industries are tangible in nature, e.g. mass production of food, pharmaceuticals, and electrical appliances. Therefore, the quality management systems applied in these sectors look different to those applied to the services sectors, e.g. providers of consulting services or large government departments. Still, there are many common elements associated with good quality management that apply across all sectors. Identifying these, and structuring them into a simple conceptual model that can be readily understood, is the novelty and key focus of this paper. In order to achieve this, we will outline the different elements that characterize a competent quality manager. This model can be used to shed light on some of the important attributes of the quality manager in a quick and easy to understand way.

2. Literature review

The broad field of quality management touches upon many areas, e.g. professional standards certification. ASQ and the Chartered Quality Institute (CQI) are two leading bodies associated with professional quality manager certification worldwide, headquartered in the US and the UK, respectively. The ISO is a leading worldwide body in voluntary standards certification (ISO 9001 series), and operates across all sectors to ensure that products and services are safe, reliable, and of good quality (ISO, 2014). As well as these larger bodies, each sector typically has their own professional body that oversees standardization and quality certification, such as IEEE in electrical engineering, or VDA QMC in the German automotive industry.

Important contributions were made by pioneers such as William E. Deming with the Plan-Do-Check-Act (PDCA) methodology (Deming, 1986), Armand V. Feigenbaum, who developed total quality control (Feigenbaum, 1961), and Taiichi Ohno, who was instrumental in developing the Toyota Production System (Ohno, 1988).

The above developments in quality management are largely oriented toward applied knowledge, the understanding of processes and systems, and numerical analysis. Focusing on the required knowledge of individuals, the ASQ, as part of their overall Quality Book of Knowledge (QBOK), talk about the ‘quality journey’, which has the following four elements in sequential order (ASQ, 2015): (1) Pursuit of Personal Excellence; (2) Pursuit of Operational Excellence; (3) Pursuit of Organizational Excellence; and (4) Pursuit of the Quality Ideal. The first of these, Pursuit of Personal Excellence, mentions personal qualities like interpersonal and social skills, emotional intelligence,

communication effectiveness, persuasion/influence, leadership skills, as well as more intangible qualities like life fulfillment, human spirit, and quality philosophy.

On a similar note, the CQI has developed what they call “The CQI Competency Framework” in order to provide an overview of the competencies the professional quality manager requires to do their job effectively (CQI, 2017). This framework consists of five topics, namely context, governance, improvement, assurance, and leadership. Each topic is typically explained in terms of the corresponding roles the professional quality manager should fulfill, with less emphasis on personal attributes. The language and terms used in this framework indicate that it is aimed toward quality managers in large organizations dealing with a wide variety of stakeholders.

Imler (2006) writes about core roles in a strategic quality system. He introduces a general body of knowledge that all employees in an organization operating a strategic quality system need to have. These are specific and sometimes technical topics, such as basic risk analysis, documentation practices, data tracking, and understanding of the basic continuous tools used by the organization.

A number of authors have written about the nature of the quality manager role and what makes people excel in this role. Parthasarathy (2009) considers it essential for the successful quality manager to possess emotional intelligence. He claims that emotional intelligence is important for all managers, but especially for quality managers as their line of work is complex, and becoming even more so. A quality manager has to interact with employees at all levels in the organization, as well as with other stakeholders, and be able to listen to various viewpoints and take decisions without letting emotions get in the way. Emotional intelligence is explained in this paper as being two-phased: firstly, relating to personal competence (self-awareness and self-management), and, secondly, to social competence (social awareness and relationship management). It is not considered to be acquired overnight, but something that develops with experience and time.

Wilson (2000) emphasizes that the quality manager needs to have good skills in: oral and written communication; planning and achieving objectives; functioning well under pressure; organizing effectively with attention to detail; resolving problems; and promoting the acceptance of quality management activities.

Jeffrey (1992) stresses three broad areas of management behavior that are essential for the quality manager when undertaking quality improvement in organizations, namely: motivation and performance feedback, problem analysis and decision-making, and interpersonal management skills. The quality manager must be able to motivate employees, in a non-critical way, to take part in quality improvement, and be able to give constructive feedback to link performance with organizational objectives. They must help managers make better decisions based on facts, and support them in evaluating performance and give constructive feedback. Jeffrey also emphasizes that an open and positive environment facilitates team building and reinforces motivation.

Palmer (2006) explains how the classic skills of a quality manager in, *inter alia*, leading improvement teams, resolving customer complaints, analyzing data, and managing audits, i.e. technical skills, are not enough when the quality manager is faced with the task of getting management to accept ideas relating to quality improvements, which can happen often. In his view, “best practice” for quality managers consists of aligning the idea of quality improvements to the corporate strategy, i.e. making it business-friendly by estimating the monetary value of the idea and using a team and a sponsor to promote the idea. This process is reliant on interpersonal skills to a large extent, initially in being able to gain support among colleagues and sponsors, and then when presenting to executive management, who can be difficult to persuade. Palmer stresses that communication at this level needs to be very effective in a short space of time once ideas are formally presented, and thorough preparation is key to this.

Weckenmann, Akkasoglu, and Werner (2015) conclude that there is a shift in paradigm—from a focus on technical aspects to a more universal view with the integration of ideas from social sciences. Addey (2004) describes how the role of the modern quality manager is changing from one of product policing to a more diverse role involving several aspects. “Softer skills” are increasingly important, as he outlines how quality managers need to act as salespersons, teachers, psychoanalysts, doctors, consultants, detectives, police, social workers, researchers, designers, strategists, lawyers, customers, and statisticians. He also claims that no one person can possess all these skills and that a team approach may be wise. Some interesting trends can be seen from a master’s thesis at Reykjavik University, where all public advertisements for quality managers in Iceland in the period 2012–2013 were analyzed to identify the most common criteria that applicants should fulfill. The most common criterion was general experience of quality management, but other high-ranking criteria included personal features, such as being independent and organized, taking the initiative and foresight, communication skills, and having a positive mindset (Jonsdottir & Gudmundsdottir, 2014).

Burcher, Lee, and Waddell (2008) made a comparison between British and Australian studies of the experience, satisfaction, aspiration, and development needs of quality managers in these two countries. The main source of job satisfaction for both groups is shown to be opportunities for the quality manager to improve efficiency. Also given a high rating, but varying between countries, is the opportunity for innovation, product/process development, problem-solving, people interaction/feedback, and demonstrating personal initiative. The study shows that quality managers seek to enhance their knowledge in special fields such as management in general, ISO 9001 practices, health and safety issues, and computer skills. They mention that formal education is not the main competence of quality managers—they also have to possess experience (applied knowledge), general technical skills, along with aptitude (ease) to learn and attitude. The authors also discuss teamwork and why quality managers are sometimes referred to as “change masters” in that they should show the innovative skills and rapid flexibility necessary in a fast-changing world. Referring to a former study, they conclude that there are three variants of quality management: compliance-oriented, improvement-oriented, and business-oriented. These have to be balanced in accordance with the situation in each specific organization.

Elg et al. (2011) explore the landscape of quality managers and put forward the question of what is on the agenda for the contemporary quality manager. They explore the roles performed, activities undertaken, and the characteristics of the quality manager. From a survey they carried out (212 responses), they list, in order of relevance, seven roles of the quality manager considered most important to quality managers in Sweden, namely: (i) expert support; (ii) internal consultant; (iii) analyst; (iv) educator and trainer; (v) developer of methods; (vi) auditor; and (vii) strategist. They also discuss the role of the quality department as, in order of relevance: (1) focus on the customer; (2) ensuring everybody’s participation in improvement work; (3) standardization; (4) cost focus; (5) competence development; and (6) product leadership. They find that the role of the quality manager is at a crossroads, and discuss how it might evolve over time, especially how the quality manager might become extinct in favor of Lean Six Sigma practitioners.

Table 1 gives an overview of the references above, and presents some of the similarities and differences in the arguments put forth by the different authors. The overview is presented in a timeline form to give an impression of how the competencies quoted by different authors have changed over time.

Something can be learned from the adjacent field of project management, where much can be found in the literature on the competence of the project manager. Several country- and sector-specific standards can be used to test and qualify project managers for their competence to do a job. The use of the IPMA Competence Baseline is widespread in Europe and provides thorough guidelines for project managers wishing to develop their knowledge and skills in order to increase their competence for the profession. In comparison, a similar general European standard for quality managers

Table 1. A timeline overview of the contributions of some authors that have discussed the role of the quality manager, in the period 1992–2015

Areas of importance for the role of a quality manager	Year	Author
Motivation and performance feedback, problem analysis, and decision-making, interpersonal management skills	1992	Jeffrey
Specific skills, e.g. in oral and written communication, planning, functioning under pressure	2000	Wilson
Diverse role with several aspects, “softer” skills increasingly important	2004	Addey
Specific topics such as risk analysis, documentation practices, data tracking	2006	Imler
Lead improvement teams, resolve customer complaints, analyze data, manage audits	2006	Palmer
Management in general, ISO 9001 practices, health and safety issues, and computer skills. Experience, technical skills, teamwork, and change management	2008	Burcher
Emotional intelligence	2009	Parthasarathy
Expert support, internal consultant, analyst, educator and trainer, developer of methods, auditor, strategist	2011	Elg
General experience of quality management, be independent and organized, take initiative, communication skills, a positive mindset	2014	Jonsdottir & Gudmundsdottir
Paradigm shift from technical focus to a universal view, integration of ideas from social sciences	2015	Weckenmann

is not available. The 3rd version of ICB was published in 2006 and it is classified into three different aspects, namely:

- *Technical competence*, which deals with the project management matter which the project managers are working on.
- *Behavioral competence*, which deals with the personal relationships between the individuals and groups managed in projects.
- *Contextual competence*, which deals with the interaction of the project team within the context of the project and with the organization.

The different aspects are presented graphically as “The Eye of Competence” (EOC), which represents the integration of all the elements of project management as seen through the eyes of the project manager (International Project Management Association [IPMA], 2006). Within these different aspects, the key competence that relate to the particular headings are listed, giving a clear and comprehensive overview of what it takes to be an exemplary project manager. A fourth version of ICB was in fact published in 2015 and is being implemented at the time of writing this paper. This new version has a modified structure, but the content remains quite similar. Different terms are used for the three basic aspects, namely people (instead of behavioral), practice (instead of technical), and perspective (instead of context). There is a notably increased emphasis on behavioral aspects, as compared to the third version.

Where the project manager and the quality manager sit in the overall structure of an organization is quite different in many ways. According to ISO 9001 (2008), a management representative should be on the same level as line managers and should have the independence and authority to implement and maintain a quality management system, irrespective of their other responsibilities. This is unlike the project manager, who can be situated at various places in the hierarchy of an organization (Kerzner, 2013). In the most recent version of ISO 9001 (2015), it is in fact no longer required to appoint a management representative, even though the duties of this role are still required. In reality, the actual role of a quality manager in a specific organization can be dependent on many factors, such as their actual position in the hierarchy of the organization and the size and sector of the

organization. It might also depend on the standard in use, be it an ISO-standard, some other specific standard, or the lean management methodology (Liker & Convis, 2012). In fact, many authors in the literature do not distinguish between quality managers in terms of the organizations and sectors they operate in, or the nature of their role, although indications may be found in research (e.g. Sousa & Voss, 2001) that quality management practices are very much context-dependent.

According to Kerzner (2013), project management and total quality management bear a close similarity to each other in terms of leadership and team-based decision-making. He defines the principles of quality leadership as customer focus, obsession with quality, effective work structure, control yet freedom, unity of purpose, process defect identification, teamwork, education, and training. Kerzner also lists seven quality management principles that may be seen as closely related to the principles of project management, namely: (1) teamwork; (2) strategic integration; (3) continuous improvement; (4) respect for people; (5) customer focus; (6) management-by-fact; and (7) structured problem-solving.

The above references address the required features of quality managers, from different perspectives. Most of them emphasize the ability to communicate effectively and mention various interpersonal skills (Jeffrey, 1992; Palmer, 2006; Wilson, 2000), as well as emotional intelligence in general (Parthasarathy, 2009). Other references emphasize the wider context of the role (ASQ, 2015; CQI, 2017; Elg et al., 2011) and even point out that all the necessary skills cannot possibly be possessed by a single person, but only by a team (Addey, 2004). The literature review shows a range of desirable features but no simple holistic and graphical representation of the necessary features of the successful quality manager. Such a representation would be useful, as can, for example, be seen from the well-established definition of the necessary attributes of project managers which helps by providing a well-known structure, based on technical, behavioral, and contextual competences (IPMA, 2006).

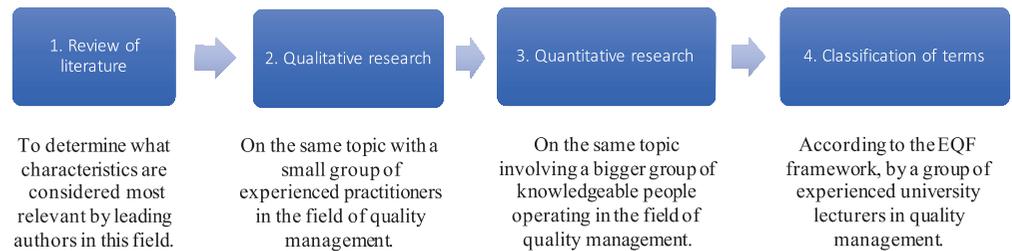
But what is a competence, what is knowledge and what is skill? Ledford (1995) teaches that there is no agreement on the definition of competence.¹ Referring to other authors, he describes it as an underlying characteristic that leads a person to effective job performance. Competence can thus be seen as including features, skills, and bodies of knowledge, among others. He mentions skills as something that has to be trained, something more basic than competence. According to The European Qualifications Framework for Lifelong Learning [EQF] (2008), knowledge is explained as an accumulation of facts, principles, theories, and methods, both theoretical and practical, that is acquired by watching, reading, listening, discussing, or from experience through action. From the same source, skills are explained as acquired through exercising methods and practices, both intellectual and practical, and involving the ability to use logical thinking. Also from the same source, competence is defined as the ability to utilize knowledge and skills. The prerequisites for competence are said to be a sense of responsibility, respect, broadmindedness, creativity, moral awareness, and an individual's understanding of their own capabilities.

3. Research methodology

In order to carry out original research on the desirable characteristics of a quality manager, a four-step mixed method approach was applied in this study. A mixed method approach was used because of the nature of the study, where a range of perspectives was sought and different methods were needed to increase the richness of the data (Pasian, 2015). The study was basically qualitative study where a quantitative method was added to provide an added value (Hesse-Biber, 2010). The flow of the research is shown in Figure 1.

The first step was to extract trends in the description of desirable features and attributes in the somewhat scarce literature on the overall competence of the quality manager. This required systematically documenting the occurrence of indicative terms, using a number of papers already referred to, in order to gain an idea of those most frequently used. Care was taken to avoid choosing

Figure 1. An overview of the four-step research approach to determine most relevant characteristics of a quality manager.



terms that referred to a specific role for a quality manager, as that role can be dependent on the size and sector of an organization.

For the second step, a focus group was put together that consisted of five experienced practitioners in the field of quality management, all of whom have been involved in the implementation and operation of quality management systems in medium-sized and larger organizations. The members were chosen for their mix of experience. Three participants had experience of working as quality managers in ISO 9001 organizations; one had experience of working as a quality manager in the private sector; and the final one had extensive experience of working as a consultant with quality managers in various kinds of organizations. The size of the group was considered appropriate for easy communication, being small enough to make participants feel comfortable to speak freely and express their true opinion. The group was invited to a brainstorming session on the overall competence of the quality manager. The session format was as follows:

- The research was explained to the participants—information had also been sent in advance, giving, in particular, an explanation of the research outline and of EOC (IPMA, 2006), which would be used for reference.
- The participants were asked to sit in silence for a while and write down as many attributes and features as they could think of on separate notes.
- The results on the notes were placed on the table for everyone to see.
- The results were discussed, and the participants grouped together the terms with similar meanings.
- The results from the literature review—written on specially marked notes—were introduced and also placed on the table to encourage further discussion.
- The results were discussed and sorted under the three dimensions of EOC, i.e. technical, contextual, and behavioral competencies.
- Lastly, a short final session was performed in silence, where the participants wrote a few additional new notes to be added to the groups of terms.

The third step in the research was carried out through a questionnaire survey on the relative importance of the terms that were the outcome of steps 1 and 2. Survey respondents were asked to assess each statement according to a five-level Likert scale, i.e. either strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree. The survey was carried out online in early 2014 and the participants were members of the Quality Management group, a subgroup of Excellence Iceland² (Stjórnvísí, n.d.). This subgroup consists of 500 members. All of them share a common interest in quality management and the members typically hold positions in their organizations as quality managers. All major business sectors in Iceland are represented in the group. A single request to participate in the survey was sent to the group by e-mail, but no attempt was made to follow up on this request.

In order to classify the terms according to the EQF framework as either knowledge, skills, or competence, a group of senior university teachers were consulted in the fourth and final step of this research. This group consisted of eight people who give lectures in quality management and operations management in Reykjavik University and the University of Iceland. In addition to being experts in

quality management, they are all familiar with using the EQF system in the writing of their course syllabuses. The members of this group contributed on an individual basis by classifying each term according to the EQF framework. This was done through a web-based survey in which the participants read all three definitions of the EQF framework for each term before choosing the most appropriate category for that particular term.

4. Results and discussion

4.1. Results

The results from the brainstorming session (research step 2) were categorized and added to the table of terms gathered from the literature. The combined results of this work are shown in Table 2.

The second column lists the different indicative terms that describe desirable attributes and their frequency of occurrence is shown for different sources. The table gives a good idea of the relative importance of the desirable attributes of a quality manager. The frequency count is somewhat speculative, however, due to a certain amount of ambiguity in the use of the terms and consequent approximation. Only those terms that came up more than once were kept in the table. Thus, many terms that only occurred once have been omitted, including terms such as motivation, legal knowledge, technical competence, standardization, and internal consultant. Many terms were categorized under emotional intelligence, such as flexibility, attitude, psychoanalyst, and social worker. According to Table 2, the ASQ Body of Knowledge (ASQ, 2015) provides a comprehensive description of the required attributes of a competent quality manager, and three of the four elements from this Body of Knowledge were used as a reference for arranging terms as organizational excellence, operational excellence, and personal excellence. The frequency count shows that topics related to organizational excellence were mentioned 24 times, topics related to operational excellence 33 times, and topics related to personal excellence 24 times. The terms most frequently mentioned were emotional intelligence and problem resolution (7 counts), strategist (6 counts), promoting acceptance of QM activities, leading improvement and teamwork (5 counts).

Four new terms emerged from the brainstorming session which were not found in the literature search. These were “contextual knowledge”, “project management skills”, “conscientious”, and “systems thinking”. These were included in further processing because there was a consensus in the focus group that they were valuable features for quality managers. Two terms from Table 2, “managing audits” and “product leadership”, were, however, discarded as they were considered to describe roles rather than competencies.

The topics from Table 2 were used as the basis for step 3 in the research, together with the addition of the four new terms. Each topic was modified to a statement, and these are listed in the left-hand column of Table 3, together with an explanation of each statement in the right-hand column. Table 3 summarizes the statements that formed the basis for the online questionnaire survey.

In all, 84 individuals responded to this survey, indicating their level of agreement or disagreement with the statements given. This corresponds to approximately a 17% response rate, an expected response rate in this type of web-based survey. The results of the survey are charted in 100% stacked column format in Figure 2.

The five levels of agreement are color-coded and attributes sorted from left to right depending on the percentage who “strongly agreed”. Overall, a large majority of responses, or about 87%, were either “strongly agree” or “agree” when averaged out across all the statements, with most of the remainder being “neither agree nor disagree”, and a very small percentage disagreeing. This indicates that the survey group was in broad agreement with what had been found during the literature review and the brainstorming session. It is noteworthy that the two attributes with the most disagreement were “customer focus” (~6%) and “cost focus” (~8%). While these are small percentages,

Table 2. Compilation of terms of competence for quality managers from the literature and brainstorming session. The frequency of occurrence of the terms is also shown

ASQ Element	Term	Elg et al. (2011)	Wilson (2000)	Addey (2004)	Burcher et al. (2008)	Palmer (2006)	Jeffrey (1992)	Parthasarathy (2009)	ASQ Body of knowledge	Kerzner (2013)	Brainstorming session	Frequency count
Organizational excellence	Customer focus	x		x					x	x		4
	Effective organization		x								x	2
	Leadership								x		x	2
	Managing audits	x				x			x			3
	Performance feedback						x		x			2
	Promoting acceptance of QM activities		x	x		x			x		x	5
	Strategist	x		x		x			x	x	x	6
	Achieving objectives		x	x					x			3
	Analyzing data	x					x		x		x	4
	Cost focus	x				x			x		x	4
Operational Excellence	Leading improvement	x			x	x			x	x		5
	Planning		x	x					x			3
	Problem resolution		x	x	x		x		x	x	x	7
	Product leadership	x		x					x			3
	Quality management tools					x			x			2
	Statistics			x					x			2
	Communication skills		x				x		x		x	4
	Educator and trainer	x		x					x	x		4
	Emotional intelligence			x		x		x	x		x	7
	Experience					x					x	2
Personal excellence	Functioning under pressure		x								x	2
	Teamwork				x	x			x	x	x	5

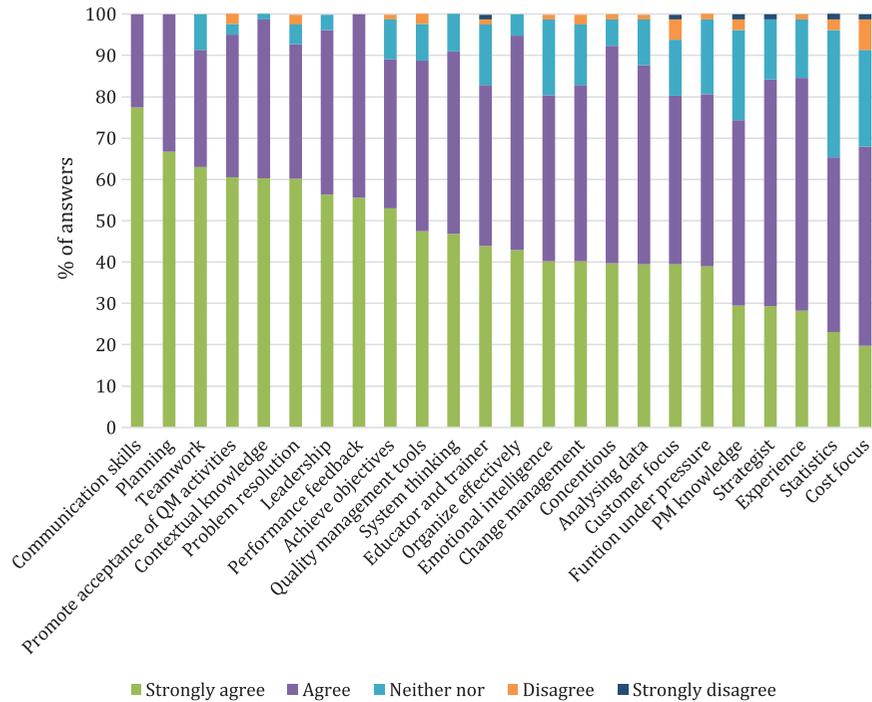
Table 3. Statements on the competence of the quality manager as sent out in a survey to members of the Quality Management group. Further explanations are also shown, though not part of the survey

Statements	Explanation
Emotional intelligence is a necessary trait for the quality manager	A mixture of self-awareness, self-management, social awareness, and relationship management
The quality manager must be objective-driven	Sets out clear objectives and meets them
The quality manager has a mindset for problem resolution	Detects problems and brings them up for resolution
The quality manager must promote acceptance of quality management throughout the organization	Convinces everybody in the organization of the benefits of quality management
The quality manager must have an analytical mind-set	Is able to analyze various data and see trends and patterns
The quality manager is competent in giving constructive feedback	Motivates people by giving performance feedback in improvement work
The quality manager has the competence to work under pressure	Is able to show self-control in stressful situations
The quality manager is experienced in a general way	Applied knowledge that comes with experience as in contrast to formal education
The quality manager shows leadership behavior in an appropriate manner	Chooses the appropriate leadership style and level in a specific situation
The quality manager is conscientious	Pays attention to details
The quality manager is competent in systems thinking	The ability to see how things connect into a system
The quality manager has excellent knowledge in change management	Uses documented change-management methods
The quality manager must have thorough understanding of customer needs	Identifies the customers outside the organization and how their needs link to quality management
The quality manager must always keep in mind the cost aspect	Is able to identify the cost aspect, i.e. the monetary benefits of quality management
The quality manager has good knowledge in the use of traditional quality management tools	The 7 basic quality tools: Cause and effect diagrams, flowcharts, check sheets, Pareto diagrams, histograms, control charts, and scatter diagrams
The quality manager has knowledge of statistical analysis	Knowledge of classical statistical methods
The quality manager seeks to understand the context of the organization	Pays attention to the larger organizational context and its influence on the quality management work
The quality manager has excellent knowledge of project management	Knows how to apply project management concepts
The quality manager must have excellent communication skills	Both communication techniques such as verbal and written, and interpersonal skills
The quality manager must possess skills in effective planning	Makes a plan and carries it out successfully
The quality manager is a skilled strategist	Makes a strategy for implementing quality management and links it to business strategy
The quality manager must have skills in educating and training co-workers	Is able to train and educate the staff in quality management
The quality manager possesses excellent skills in teamwork	Builds a team, leads it and works with it successfully
The quality manager is skilled in organizing effectively	Efficient organizer with attention to detail

they are nonetheless significant. The main aspect of the results, however, is the relative importance attached to particular attributes in terms of characterizing a competent quality manager.

According to the survey results, communications skills are what most members of the survey group strongly agree as being a necessary competence, while teamwork and promoting quality management were also ranked highly. All of these attributes also ranked highly in the literature review. An interesting deviation is “emotional intelligence”, which had the highest ranking in Table 2, but is shown to have a somewhat lower rating in Figure 2. All of the above attributes would typically be considered as “soft skills”, in contrast to more technical skills that would be considered as “hard skills”. The results, therefore, indicate that soft skills are highly valued for practitioners in the field of quality management and this is in line with the findings from the literature review. Within the range of “hard skills”, it is noteworthy that “statistics” received a lower rating with around 65% either strongly agreeing or agreeing.

Figure 2. Results from the survey of members of the Quality Management group at Excellence Iceland. Answers are sorted according to the percentage that “strongly agree”.



4.2. Discussion

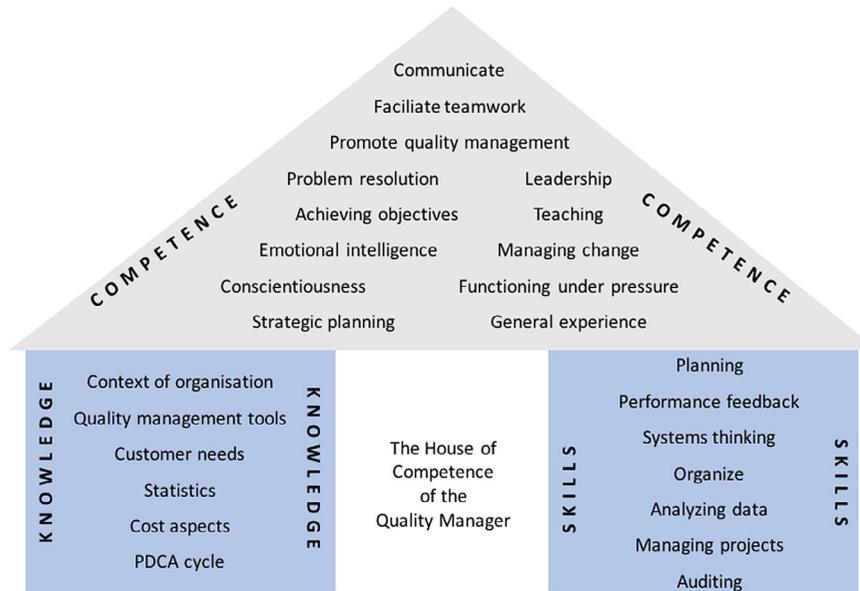
The support given by top management to quality work in organizations is of utmost importance for a beneficial outcome (e.g. ISO, 2008, 2015). In every organization, cost considerations in strategic planning are very much the focus for executive management, though the survey results indicate that cost focus is less of a priority to quality managers than other attributes. This could be interpreted as indicating that there is a tendency to be disconnected from the monetary benefits of quality management work. It could also be interpreted as reflecting the fact that quality and cost are invariably two competing elements in any product or service, with the focus of the quality manager obviously on the former. However, we maintain that our results show that 68% of respondents either strongly agree or agree with the statement that cost focus is an important competence for a quality manager. Elsewhere, communication skills are ranked highly in the competence survey in contrast to knowledge of statistics, which is ranked lower. One can only speculate on the reason for this, as well as the impact that these divergent opinions have on the work of the quality manager. It is possible, in some cases, that quality managers do not get the much-needed support from top management because they do not use means such as cost calculation and statistics to facilitate communication and the alignment of quality management work to the strategy of the organization.

In the survey, the participants mentioned some additional features that they thought were necessary for the quality manager, such as skills in process design, understanding internal audits, patience, good listening skills, understanding the PDCA-cycle, knowledge in the use of performance measurements, choosing the right people to work with, and quick problem solving. There was also a reference to the different roles played by quality managers in different organizations, e.g. dependent on the size of the organization. Thus, the bigger the organization, the more strategic the role of the quality manager. The necessity of the independence of the quality manager was also stressed.

5. Synthesis of results: Conceptual model

In order to best represent the findings of this study, a decision was made to devise a unique graphic conceptual model that was informative on a number of levels and easy to understand. The terms “knowledge”, “skill” and “competence” were considered to be the appropriate headings under which to categorize the range of attributes that had been ascribed to the exemplary quality manager.

Figure 3. A new conceptual model presenting the findings from the research: The house of competence of the quality manager. The terms of the model are explained in Table 3. The terms are categorized according to EQF (2008).



With this in mind, a new conceptual model incorporating all the elements previously discussed was devised and is presented in Figure 3. Owing to its basic structure, with three elements comprising two pillars and a roof on top, it is called “The House of Competence of the Quality Manager” (or simply—the House).

The pillars here are “knowledge” and “skills”, which support the roof, representing “competence”. Lists of attributes are given for each of these elements, taken straight from the literature and survey results. In some cases, the phrasing of the attributes has been modified to specify the actual meaning. A good example here is that the term “communicate” is used in the House instead of the more general term “communication”. In each case, the most agreed-upon term from the survey is placed highest and the least-agreed lowest. Therefore, for example, “communicate” ranks highest of the skills listed. It was also decided to use the findings from the survey to add the term “PDCA cycle” to the knowledge list and to reinstate “auditing” to the skills list, which had been left out earlier in the research.

The classification of the terms according to the EQF framework showed that for most of the terms, there was a good consistency in the classification, but for a few of the terms there was some inconsistency within the expert group. For instance, regarding “communicate” (classified as a competence by 4 and skill by 4), “conscientiousness” (classified as a competence by 4 and skill by 4), and “performance feedback” (classified as a skill by 3, knowledge by 3 and competence by 2). The final decision—when the group was split—was made by the authors.

The terms in the pillars are the more basic and elementary features that the quality managers need to possess to underscore the more complex attributes in the roof, the actual competencies that to some extent derive from the more basic knowledge and skills in the pillars. There is no doubt that the features are interconnected in many complex ways. A deeper analysis of this interconnection in the House is an interesting research topic connected to behavioral science. A deeper analysis of the meaning of some of the terms would also be in order, e.g. the terms where the group of university lecturers was not consistent in its classification according to the EQF system.

No specific contradictions have been found in the message of the different references from the theory section and the present study. The link between the elements of the new conceptual model and earlier research can be seen in Table 2 and the classification into knowledge, skills, and

competence is an attempt to narrow the discussion and facilitate a more specific definition of the terms. The present study thus accumulates the findings of earlier researchers, confirms them, and provides a simple holistic picture of the necessary attributes of a successful quality manager—the House.

The relevance of the House can, for example, be seen when looking at the most recent version of the ISO 9001 standard (2015); a shift in emphasis can be seen in many topics correlating with the terms presented in the House. The PDCA cycle is integrated in the standard through its structure, indicating a stronger emphasis on continuous and systematic improvements. This also reflects a greater emphasis on how quality management activities can bring value to an organization and its customers. The requirements for process approach is stronger in the revised standard, emphasizing the measurement and assessment of the input and output of processes, and this focus correlates with the term “systems thinking” included in the House. This is also in line with an increased emphasis on the need to understand the context of an organization and to identify customer needs both inside and outside the organization, and identify their expectations. Also, increased emphasis will be put on competence of personnel, which, in turn, matches the overall aim of the House.

The structure of the House symbolizes the view of the authors that the overall competence of an individual needs to rest on strong pillars and should be well-balanced, neither lopsided nor top-heavy. The target audience for this model is, e.g. individuals—interested in pursuing a career as quality managers or within quality management departments of organizations, managers—interested in building up relevant competences in their organizations in the area of quality management, and educational institutions—interested in building up courses or study programs in the area of quality management. The managerial implications of the model can be manifold. Quality managers or quality teams can apply the model for assessing themselves (or have others assess them) using this structure as a guide and strive to balance and strengthen it where deemed necessary. In other words, it can be used to define the profession of quality management and can be a useful tool for organizations to evaluate their own resources in this area. It can also prove to be a useful tool for those who recruit quality managers, for defining the relevant criteria, especially when deciding which candidates are most suited to a particular role. Given that demand for salary is based on competence, companies might have to settle for less competent quality managers. As mentioned above, different types of organizations in different sectors will have different roles for quality managers, and greater or lesser prominence can be given to the attributes listed depending on context. Overall, it is felt that this conceptual model approaches the subject of quality management competence in a somewhat different way to the CQI and the ASQ (who also have approaches that differ somewhat from each other), with a greater emphasis on the individual rather than on the role.

Due to the relatively small size of the sample group and the necessity to interpret the meanings of terms, the results presented here should be considered as an approximation. As studies into the competence of the quality manager are scarce, further research with a larger survey group should be undertaken to gain a more thorough understanding and to further strengthen the foundations of the model. Ideally, the sample in the survey should be broadened by including, apart from more quality practitioners themselves, those charged with recruiting quality managers and those who oversee their activities in executive management. Further research might also focus on delving deeper into the complex interconnection of the terms in the House and how they weigh differently in various contexts. Furthermore, quality management practitioners and experts from other countries should be included in future research. Finally, we feel that the application of the EQF framework was particularly valuable and a further study of the terms in context with knowledge, skills, and competencies would be of great value.

6. Summary

A new conceptual model has been presented that highlights the different attributes of the exemplary quality manager, categorized under three different headings; knowledge, skills, and competence. The model can serve as a useful tool for assessing both individuals and teams, showing where

different strengths and weaknesses may lie. This simple graphical model can help to shed light on some of the important attributes of the quality manager, in a quick and easy to understand way. The authors are confident that the model is representative of the broad field of professional quality management although it is recognized that different contexts may call for changes in the prioritization of the attributes listed.

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Notes

1. According to Merriam-Webster online dictionary, competence is a synonym for competency and in this paper we prefer to use the word competence.
2. Excellence Iceland or Stjórnvisi is an association of managers in Iceland with nearly 2,000 members.

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