



28th IPMA World Congress, IPMA 2014, 29 September – 1 October 2014, Rotterdam, The Netherlands

# Best Project Management Practices in the Implementation of an ISO 9001 Quality Management System

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## Abstract

The implementation of ISO 9001 quality management systems in 21 organizations was studied through semi-structured interviews with the respective quality managers. In general, the organizations seem to look at the implementation of a quality management system as a project and they employ standard project management tools, albeit to a different extent and in different ways. The commitment and direct participation of management was a key factor for a successful implementation, as well as direct participation of the employees, and good preparation and goal setting. It can be concluded that organizations that planned for their internal cost of implementation, that is the cost of direct participation of the employees, were likely to implement their quality management systems in the time they expected—and their time of implementation was shorter than for organizations that didn't look at this internal cost.

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Peer-review under responsibility of Scientific Committee of IPMA 2014.

*Keywords:* ISO 9001; implementation; project planning; key success factors; internal cost

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## 1. Introduction

Quality management and project management are related disciplines. Project management has long been associated with the term “temporary organization” whereas quality management has been associated with the term

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“permanent organization”. However, project management as a discipline has matured towards the management of permanent organizations. This orientation reflects a modern organization that brings value to its customers through projects and has chosen to organize its activities to a large extent by initiating, executing and delivering projects. This trend is driven by the business environment and the markets, which demand that organizations be increasingly responsive and dynamic.

Project management maturity is rising. PMI's Pulse of the profession in 2012 reported that 20% of participants in the annual global survey of practitioners and project management leaders described their organizations as having high overall project management maturity. The corresponding figure in 2006 was 11% (PMI, 2012). This observation is in line with another large survey by PWC, the Global survey on the status of project management where more than 62% of companies in the 2012 survey were operating in level 4 or level 5 of the maturity scale. The corresponding figure in 2004 was 21.9% (Clack, Fass, Graeber, Honan and Ready, 2012). The PMI report points out a clear correlation between higher maturity levels and on-time and on-budget delivery in projects (PMI, 2012).

Increasing project management maturity reflects a clear trend. Organizations are applying process approaches in their operations, in other words, they are using quality management in their project management. Organizations are increasingly standardizing their project management practices across all or most of their enterprise (PMI, 2012).

One aspect of this synergy is the way organizations implement quality management in their operations. As part of a research project into the perceptions of employees of ISO 9001 certified organizations regarding the quality management systems in their organizations, the way in which organizations had implemented their ISO 9001 quality management systems was assessed. The aim of this paper is to shed light on the implementation as a project and the project management practices that are applied in the implementation of ISO 9001 quality management systems.

## 2. Theory

Quality management as a management field is rich with research on different aspects and theories, empirical data from the field and theoretical elaborations. For a relatively young discipline, some of its basic aspects are well defined and established through well-known and widely used international management standards such as ISO 9001 and ISO 14001. ISO 9001 is applied in different kinds of organizations all over the world. Priede (2012) discusses the total number of issued ISO 9001 certificates and countries in the world in the period 1993-2010. This has grown from more than 46 thousand certificates in 60 countries in 1993 to 1.1 million certificates in 178 countries in 2010.

The focus in research has not been on the project of implementing a quality management. Sampaio, Saraiva and Rodrigues (2009) did an exhaustive literature review of ISO 9001 studies and analyzed 100 research papers in a quest to create an overview of ISO 9001 certification research. They defined 5 categories as the main themes for research in the area:

- ISO 9001 certification market evolution.
- ISO 9001 certification motivations and benefits, barriers and drawbacks.
- Impacts on organizational performance.
- Impacts on companies' financial performance.
- ISO 9001 and TQM – are they complementary or independent from each other?

Tang and Kam (1999) did a survey of ISO 9001 implementation in engineering consultancies in Hong Kong. Only 42% of the firms in the study employed external quality consultants in developing the management systems but quality consultants were considered helpful. The time it took to achieve certification by 19 firms in this study varies from 9 to 24 months and the average was 14 months.

Poksinka, Eklund and Dahlgaard (2006) studied the implementation of ISO 9001 in small organizations with emphasis on lost opportunities, benefits and influencing factors. This was a case study with three small organizations. They concluded that many opportunities for improvement were lost in the way ISO 9001 was

implemented and operated as the standard was implemented by standardizing the practice and not by practising the standard.

Naveh and Marcus (2005) did a literature survey and a case study and identified two stages in implementing ISO 9000, Firstly installation, which has two dimensions: (a) external coordination and (b) integration. Secondly usage, which also has two dimensions: (a) in daily practice and (b) as a catalyst for change. Installation consists of concept development and preparation. It is both the attempt to set the management standard in place and the form of planning that occurs before the standard is used. It includes introducing the standard, establishing a system for carrying it out and developing the rules for how it will be applied.

Kim and Kumar (2011) did a three stage systematic review of literature and concentrated on three key aspects of ISO 9000 implementation; motivations, critical success factors and impacts of ISO 9000. Their findings are based on 100 studies. They propose a three part performance realization framework for implementing ISO 9000; conversion, enhancement and the competitive priority stage. The first stage aims at constructing a foundation to operate quality based systems, processes and culture. The main output of the conversion stage is improved systems, standardized processes and learning and communication environment. During the conversion stage, management should focus on such topics as leadership, training, involvement of everyone, provision of organizational resources, establishing a quality oriented culture and a customer based approach.

Many researches have focused on barriers to successful implementation. Al-Rawahi and Bashir (2011) did a comparative investigation on the implementation of ISO 9001:2000 in Oman. 42 ISO 9001 certified organizations of different size and sector were studied. No strong evidence was found to suggest that the motives for implementation, the process and cost of achieving certification, the perceived benefits and the shortcomings, differ significantly according to organization size or sector type. Zeng, Tian and Tam (2007) explored the barriers to implementation of ISO 9000 in China. They highlighted the problems in implementing the standard, some of them being short-sighted goals for “getting certified”: over-expectation on the standard, a mandatory requirement rather than wholehearted commitment and following the trend in certification. 41 percent of the respondents reported that their companies had implemented the ISO 9001 standard seriously, while 52 percent of the respondents reported a more perfunctory implementation of the standard. Urbonavicius (2005) studied ISO system implementation in small and medium sized companies from new EU member countries. The research confirmed that initially the main motivation to implement ISO systems is different from the main benefits of its implementation—as perceived after the project completion. The motivational arguments most often are of marketing and sales nature, while the main benefits experienced after implementation have to do with management, for example operational efficiency. Bhuiyan and Alam (2004) did an empirical study on Canadian firms who had implemented ISO 9001 with focus on the difficulties they had to deal with. Larger companies faced fewer difficulties in the implementation process than smaller ones, but the number of years the companies had been in operation had no effect on the difficulties in implementation. Yahya and Goh (2001) found out that ISO 9001 elements that relate to an organizational quality system—such as corrective and preventive actions, design control, management responsibility, statistical techniques, process control and document and data control and quality systems—are hard to implement, compared to elements that relate to operational procedures. These findings are in line with the findings of Gunnlaugsdottir (2010) who studied the motives, challenges and benefits of ISO 9001 certification in more than 40 organizations in Iceland. She discovered that the difficult challenges in the implementation involved fulfilling those requirements of the standard that have to do with control of documents and records. Boiral (2011) came to similar conclusions. Based on qualitative interviews with 189 managers and employees working in ISO certified organizations, his results showed that the positive or negative impacts of ISO management systems depended on specific factors. The main pitfalls are inappropriate or excessive documentation and lack of follow-up and system continuity. Al-Najjar and Jawad (2011) did an empirical study on ISO 9001 implementation barriers and misconceptions in the service and manufacturing sectors in Iraq. Examples of important barriers to ISO 9001 implementation are a lack of top management commitment, employee resistance,

difficulty of performing internal audits, absence of consulting boards, ISO 9001 requirements are unrealistic, lack of financial and human resources, insufficient employee training and insufficient knowledge about quality programs. According to the findings of Sampaio, Saraiva and Rodrigues (2009), ISO 9001 motivations and benefits can be categorized as being primarily external—related to marketing and promotional issues—or internal—related to internal organizational improvements. They furthermore conclude, based on the literature, that companies maximize their benefits if they achieve ISO 9001 certification based on internal motivations. Lack of involvement by top management is considered to be the main obstacle faced by companies during ISO 9001 implementation and certification.

### 3. Method

The research was undertaken in Iceland. The total number of ISO 9001 certified organizations in the country is 50 at the writing of this paper. For this research, 21 organizations were chosen. The organizations were chosen to represent all business sectors and give a very good cross section of certified organizations in the country. They consist of consultancies, contractors, production companies, IT companies, private service companies and official institutions of different kinds, e.g. schools, utility companies and service companies. A total of 21 quality managers, or managing directors, were interviewed about the implementation of the ISO 9001 standard in their organizations, the extent to which project management was applied, what tools and techniques were used and what the most important success factors were in their implementation. A semi structured question list was applied; the interviews were arranged as a mixture of closed questions and more open questions where the participants described specific strategic attributes, methods and practices that related to their organizations.

### 4. Results

The organizations are of very different types and sizes but to some extent, project management methodology was used in the implementation of the quality management systems in all of them. An overview of the organizations is given in Table 1.

Table 1 Overview of the organizations that participated in the research, their classification according to NACE (Nomenclature of Economic Activities—the European statistical classification of economic activities), the year of certification and the number of employees.

<u>NACE listing</u>	<u>Year of certification</u>	<u>Employees</u>
Manufacturing	2013	1-49
Manufacturing	1994	250-299
Manufacturing	2012	50-99
Manufacturing	2008	50-99
Electricity, gas, steam and air condition supply	2009	50-99
Construction	2009	150-199
Transporting and storage	2013	100-149
Transporting and storage	2010	300-
Information and communication	2009	1-49
Information and communication	2002	1-49
Information and communication	2002	300-
Professional, scientific and technical activities	2011	1-49

Professional, scientific and technical activities	2012	1-49
Professional, scientific and technical activities	2004	150-199
Professional, scientific and technical activities	2009	250-299
Professional, scientific and technical activities	2007	50-99
Public administration and defense; compulsory social security	2012	1-49
Public administration and defense; compulsory social security	2006	150-199
Public administration and defense; compulsory social security	2011	50-99
Education	2005	1-49
Education	2009	100-149

There are differences in the extent to which different methods of planning were applied, and the time it took the organizations to implement the system varied a lot. On average, the time for implementation was 18 months, the maximum time was 48 months but three organizations reported that the implementation had taken 6 months. The participants were asked to choose between statements that described their perception of the time it had taken to implement the system, as compared to the planned time.

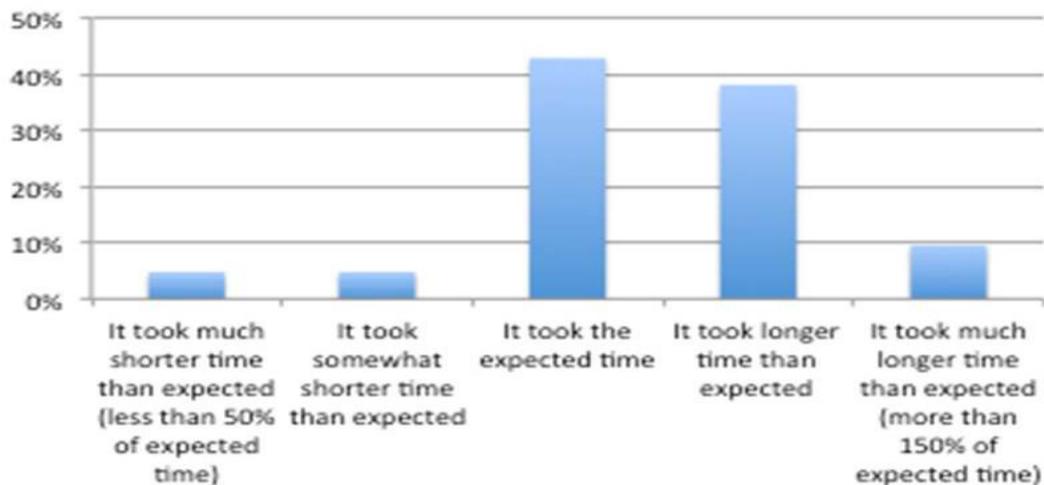


Fig. 1. Participants' perception of the time it took to implement the system, as compared to the planned time.

Some common factors contributing to a successful implementation could be found for many of the organizations. The participants were asked specifically to what degree project planning had been applied in the implementation. 29% said that the implementation was carried through by following an initial plan. Another 29% stated that the implementation was carried through by following an initial plan that had to be changed frequently. However, 33% of the participants stated that the implementation was carried through using continuous and regular communication between the relevant parties; there was no formal plan. In 10% of cases, the implementation was primarily in the hands of one person, namely the quality manager. Table 2 gives a more specific overview of the degree of project planning that the organizations applied in their implementation.

Table 2 Answers to closed questions that relate to the degree of planning that was applied in the implementation of ISO 9001. The closed questions are statements and the participants could choose to agree, disagree or be neutral.

Statement	Agree	Neutral	Disagree
The implementation of ISO 9001 was considered to be a project	90%	5%	5%
In the beginning, a project plan was created representing the tasks and the estimated date of project close-down	76%	10%	14%
In the beginning, a cost estimate was made for external cost such as the cost of the certification body	76%	10%	14%
In the beginning, a cost estimate was made for internal cost such the time spent by the employees for the implementation	29%	10%	61%
In the beginning, a project organization was defined, stipulating e.g. who was leading the implementation	86%	0%	14%
In the beginning, the scope was well defined, e.g. what parts of the organization were included in the implementation	95%	5%	0%
In the beginning, a communication plan was defined, e.g. for the meetings to be held	62%	14%	24%
In the beginning, a plan for storing relevant project information was made, e.g. minutes of meetings and other formal documents	85%	5%	10%

The participants were asked to list tools and techniques they had applied in the implementation. A list of tools was given to choose from, but in addition, the participants could add tools to the list. An overview of the results is given in fig. 2.

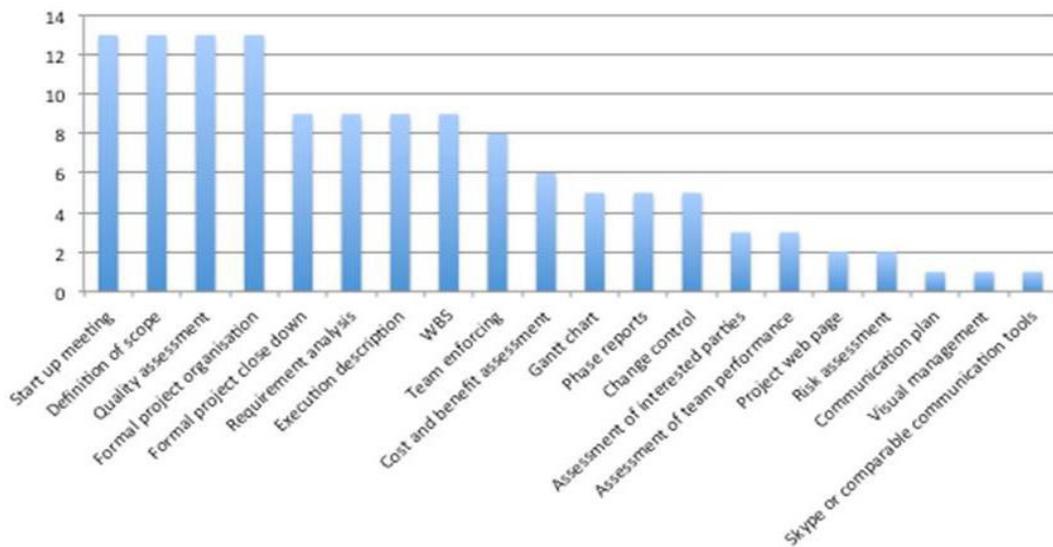


Fig. 2. Overview of project management related tools and techniques that were applied in the implementation. Participants could select one or more tools. The y-axis shows the number of times a specific tool was chosen.

Finally, the participants were asked to identify some key factors that had contributed to success in the implementation.



Fig. 3. Overview of key success factors in the implementation, as indicated by the participants. The scale shows how often a particular success factor was mentioned.

The data set was categorized and a group of organizations that fulfilled two conditions was created.

- The group included organizations that agreed to the statement that in the beginning, a cost estimate was made for internal cost, such as the time spent by the employees for the implementation.
- The group excluded organizations that stated that the implementation was carried through without any project planning but by using continuous and regular communication between the relevant parties.

A total of 5 organizations fulfilled these conditions. The same organizations were likely to be also applying other project management tools such as having a start-up meeting and formal project close-down, formal project description, WBS and scope definition. The average time for implementation in the case of these organizations was 13 months; in all cases, this was the time that had been planned for the implementation.

Seven organizations stated that the implementation was carried through without any project planning but by using continuous and regular communication between the relevant parties. Most of them claimed that the implementation was seen as a project. These organizations were however not likely to apply standard project management tools, except for a start-up meeting (4 organizations) and a formal project organogram (5 organizations). The average time for implementation for these organizations was 24 months and this was always a longer time than the organizations had expected.

## 5. Discussion and conclusions

The implementation of an ISO 9001 quality management system can easily be seen as a project, with a limited time span and specific deliverables. Yet the literature does not contain much research on the application of project management in the implementation of quality management systems and this aspect is excluded in the overview of

ISO 9001 certification research by Saraiva and Rodrigues (2009). Navey and Marcus (2005) and Kim and Kumar (2011) present frameworks where the implementation is defined but these frameworks are quite general and provide no specific information on the implementation as a project.

The present research is based on semi structured interviews with quality managers in 21 ISO 9001 certified organization in Iceland—this is more than 40% of all certified organizations in the country at the writing of this paper. The organizations are of different sizes and they work in different areas and half of them have been certified since 2010 or later. The organizations give a good cross section of ISO 9001 certified organizations in Iceland.

A vast majority of respondents in this study stated that the implementation was seen as a project and they employ standard project management tools, albeit to a different extent and in different ways. On average the implementation took 18 months, this is not far from the 14 month average time of implementation reported by Tang and Kam (1999). A formal time plan was made in most cases and a formal project organization created. The scope of implementation was well defined, external cost was estimated and plans were made for storing of project information.

Standard project management tools and techniques were applied in many cases: e.g. start-up meetings, scope definition, quality assessment, defining of a formal project organization, formal project close down, requirement analysis, execution description, WBS and team enforcement—these were the most frequently used tools according to the participants. The key success factors in the implementation were support by the management and direct participation of management, as well as direct participation of the employees in the implementation process. These observations are in line with the results of Zeng, Tian and Tam (2007), Yahyta and Goh (2001), Al-Najjar and Jawad (2011) and Sampaio, Saraiva and Rodrigues (2009).

The present study also shows that good preparation and organization of the implementation is considered a key success factor; this might in fact be classified as the application of project management. At first sight, most of the organizations claim to apply project management in their implementation and it is thus difficult to do any comparison of the success of organizations who apply project management and those who don't.

A closer look at the data, however, shows that only a part of the organizations looked at the internal cost of implementation: the time spent by employees in the implementation process. The literature and the present study agree that direct and active participation of the employees is a key success factor in the implementation, and a professional project management approach to the implementation would include this cost in the early planning stages of the project.

The results clearly show that organizations who planned for the internal cost of implementation concluded their ISO 9001 certification in 13 months, and in all cases this was according to their plans. On the other hand, organizations that did not use project planning but based the implementation on continuous and regular communication, concluded their ISO 9001 certification in 24 months, and this was in all cases a longer time than the organizations had expected.

Realizing that direct participation of employees in the implementation of an ISO 9001 quality management system is essential from a quality management perspective is one thing; but understanding what this means in terms of planning an implementation project is another thing. A famous quote to Winston Churchill is an appropriate ending to this paper; "If you fail to plan, you plan to fail." In other words, if organizations fail to understand that the essential direct participation of employees takes time—and include this in their plans—they are bound to be disappointed and attain their ISO 9001 certification later than they expected, and at higher cost.

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