

Opportunities impact of management project on implementing quality management system

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Abstract— Quality demarche or Quality management System establishment is considered, in majority of business, a collective project with a wide wingspan, in order to help the managers to maintain their differentiation and their evolution, and let them ensure their business sustainability. This project requires mainly the board commitment, all staff involvement, the quality responsible appointment, and set up a steering committee. Furthermore, the quality demarche success depends on many issues, linked to the tools and to selected practices. In this context, this framework is enrolled with the main objective to show the practices impact opportunities of projects management in implementing a quality management system.

Keywords— QMS implementing methods and tools, projects management practices, ISO 9001, key success factors, barriers implementing.

I. INTRODUCTION

All business, whatever their size, are organizations which want to exist and survive, to be developed and diversified, ensure that they are profitable, to conserve their independence and let their personal reach their aims. To realize and reach their hopes, in a contemporary environment, influenced by a rough competition, technological evolution, automation, and globalisation, the company have to adapt continually its organization, and has no choice to put what we call a management system. However, there are many management systems, which set on international known standards. The well-known standards are: ISO 9000 Quality management, ISO 14000 Environmental management, ISO 3166 Countries codes, ISO 26000 Social responsibility, ISO 50001 Energy management, ISO 31000 Risk management, ISO 22000 Food safety management, ISO 27001 Information safety management, ISO 45001 Health and safety at work, ISO 37001 Anti-corruption management system and ISO 13485 Medical dispositive [1]. In our framework, we will interest in ISO 9001 V 2015, because it is an international and a common standard, and it's the much used worldwide. More than 1 million certifications have been pronounced between 2000 and 2008. Priede has discussed the total number of ISO 9001 certification in all countries from 1993 to 2010 and he discovered that there were 600 certifications in 60 countries in 1993 against 1.1 million certifications in 1978 countries in 2010 [2]. Quality management system (QMS) is defined as

group-correlated elements or in an interaction organism, used for politics establishment, objectives, and processes so to reach objectives [3].

In fact, implementing a management system is a global company project, which mobilises all workers and it's therefore necessarily to define a system organization that is integrated in the company and articulates with the existing company. This organization demands a reflexion teaming up the management and all staff, in order to define smart objectives, accepted by all. This organization could face some difficulties and barriers, or fail in implementing a management system [4]. However, there are different methodologies to implement such as system [5]. The methods and practices used are important to successful implementation. In this context, the aim of this work is to show that the ISO 9001 QMS implementation can rely on Project Management practices. To answer our problematic, we will use the following method: first of all, we will explore some studies results; In a second part, we will bring closer tools and techniques used to implement a QMS (quality management system) with project management processes according to PMBOK; And in a final part, we will focus on ISO 9001 V 2015 standard requirements, and we will project those requirements on project management processes according to PMBOK.

II. METHODOLOGY

A. Literature review

The research first part was mainly based on literature review:

The first article was undertaken in Iceland in 21 organizations, which represent all business sectors and give a very good cross section of certified organizations in the country.

The research was based on interviewing quality managers, or managing directors 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 [6].

The study shows which tools and techniques were applied in the implementation, and identifies some key factors that had contributed to success of this implementation.

The results were given in TABLE I and TABLE II.

TABLE I
OVERVIEW OF PROJECT MANAGEMENT RELATED TOOLS AND TECHNIQUES THAT WERE APPLIED IN THE IMPLEMENTATION.

Technique and tools	Total of organizations using the tool	%
Start up meeting	13	62%
Definition of scope	13	62%
Quality assessment	13	62%
Formal project organization	13	62%
Formal project close down	9	43%
Requirement analysis	9	43%
Execution description	9	43%
WBS	9	43%
Team enforcing	8	38%
Cost and benefit assessment	6	28.5%
Gantt chart	5	24%
Phase reports	5	24%
Change control	5	24%
Assessment of interested parties	3	14%
Assessment of team performance	3	14%
Project web page	2	9.5%
Risk assessment	2	9.5%
Communication plan	1	5%
Visual management	1	5%
Skype or comparable communication tools	1	5%

TABLE II
OVERVIEW OF KEY SUCCESS FACTORS IN THE IMPLEMENTATION, AS INDICATED BY THE ORGANIZATIONS CHOSEN IN THIS RESEARCH

Key success factors in the implementation	Nbrs of organizations	%
Management support and participation	13	62%
Participation of employees in the process	13	62%
Good preparation and organization	13	62%
Clear objective setting	13	62%
Internal marketing towards the employees	9	43%
Internal audit	9	43%
Active quality council	9	43%
Use of external consultant	9	43%
Strong quality culture	8	38%

This study has also shed light on many researchers which have focused on tools and techniques used, and what are the most important success factors in the implementation. Here after, in TABLE III, a recapitulate of those researchers. The tools and practices are developed and studies about the successful implementation have been conducted in several countries. Nevertheless, It is possible, for example, to adopt similar practices in different scenarios, since they have similar cultures and several studies have related that the most popular practices and tools of Quality Management are [4]: six sigma, failure mode and effect analysis (FMEA), quality function deployment (QFD), benchmarking, 5S, total quality control (TQM), stratification, Pareto diagram, Ishikawa, histogram and control chart, Managerial commitment, Adequate

organizational culture, Leadership, Human resources management, Strategic planning quality, Employees and suppliers management, Comprehends people, Improvement and Teamwork.

TABLE III
OVERVIEW OF SOME RESEARCHERS HAVE FOCUSED ON IMPLEMENTATION OF ISO 9001

Success factors used in the implementation	Research
Top management commitment	Al-Najjar and Jawad did an empirical study on ISO 9001 implementation barriers and misconceptions in the service and manufacturing sectors in Iraq [7]
Lack of resistance Employee	
Performance of internal audits	
Presence of consulting boards	
Financial and human resources	
ISO 9001 requirements are realistic	
Sufficient employee training	
Sufficient knowledge about quality programs	Sampaio, Saraiva and Rodrigues 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 [8]
Internal motivations	
Involvement by top management	Navey and Marcus present frameworks where the implementation is defined. They did a literature survey and a case study and identified two stages in implementing ISO 9000 [9]
Installation, which has two dimensions: external coordination and integration	
usage, which also has two dimensions: in daily practice and as a catalyst for change	
Motivations	Three stage systematic review of literature are did and concentrated on three key aspects of ISO 9000 implementation [10]
Leadership	
Training	
Involvement of everyone	
Customer based approach	
Provision of organizational resources	
Establishing a quality oriented culture	Zeng, Tian and Tam explored the barriers to implementation of ISO 9000 in China [11]
Expression of Goals for "getting certified"	
The main motivation to implement ISO systems is not different from the main benefits of its implementation	Urbonavicius studied ISO system implementation in small and medium sized companies from new EU member countries [12]
Size of organization (Larger companies faced fewer difficulties in the implementation process than smaller ones)	Bhuiyan and Alam did an empirical study on Canadian firms who had implemented ISO 9001 with focus on the difficulties they had to deal with [13]

Also, it is revealed that using soft and hard element can directly impact and affect the implementation of Quality Management. The TABLE IV has shown that soft elements barriers had a big impact than hard elements during the implementation [4]. The majority of soft elements had been cited by several researchers, such as, Asif (2009), Beer (2003), Carpinetti (2010), Bunney and Dale (1997), Carvalho (2005), Harari (1993), Macedo-Soares and Lucas (1996), Mello (2011), Pinto, Carvalho and Sabater (20 and (2007) and Yang (2006).

Therefore, organizations that seek success of implementation of Quality Management practices must take special care with soft elements, which are fundamental practices to implementation.

TABLE IV
BARRIERS IN THE IMPLEMENTATION OF QUALITY MANAGEMENT PRACTICES

Techniques and tools	Type of element	Many times raised
Bureaucracy during the implementation	soft	3
Lack of communication	soft	3
Lack of leadership support	soft	3
Complexity of implementation	hard	2
Lack of training and employee development	soft	2
Lack of time to implement more complex practices	soft	2
Lack of sense of urgency	soft	2
Lack of technical knowledge	hard	2
Resistance to change	soft	2
Lack of shared responsibility among sectors	soft	2
Lack of links between quality, strategy and operations	soft	2
Lack of implementation planning	soft	2
Existence of different subcultures	soft	2
Using preset models, bumping into macro cultural differences	soft	2
Lack of credibility of who is implementing	soft	2
Do not disseminate positive result	soft	1
Negative history of other implementations	soft	1

B. Study and analysis

The most of soft elements were be found into guide of practices of project management according to PMBOK [14]. Several tools and practices used during the implementation of Quality management are inspired of project management. In order to illustrate this, we take as example the data of TABLE I and projecting it on the processes of project management PMBOK. The result is on TABLE V, we notice that the standard project management tools and techniques were applied in many cases and it is considered as a key success factor on implementation. We thus conclude that the processes of the project management are practiced during the implementation of the QMS ISO 9001 and the project management presents and constitutes a true opportunity to implement Quality Management System ISO 9001.

TABLE V
PROJECTION OF TOOLS AND TECHNIQUES ON PMBOK PRACTICES

Techniques and tools	Processes of project management according to PMBOK
Start up meeting	4.1 Develop Project Charter 4.3 Direct and Manage Project Execution
Definition of scope	4.1 Develop Project Charter 5.3 Define Scope
Quality assessment	8.3 Perform Quality Control
Formal project organization	4.2 Develop Project Management Plan
Formal project close down	6.6 Develop Schedule
Requirement analysis	5.1 Collect Requirements
Execution description	4.2 Develop Project Management Plan
WBS	5.4 Create WBS
Team enforcing	9 Management Human Resources Project
Cost and benefit assessment	7.4 Control Costs
Gantt chart	6.3 Sequence Activities

Phase reports	4.3 Direct and Manage Project Execution
Change control	4.5 Perform Integrated Change Control
Assessment of interested parties	13.3 Manage Stakeholders engagement 13.4 Control Stakeholders engagement
Assessment of team performance	9.3 Develop Project Team 9.4 Manage Project Team
Assessment of team performance	9.3 Develop Project Team 9.4 Manage Project Team
Project web page	10.2 Manage Communication
Risk assessment	11.6 Control Risks
Communication plan	10.1 Plan Communication Management
Visual management	10.1 Plan Communication Management
Skype or comparable communication tools	10.1 Plan Communication Management 10.2 Manage Communication

We will expose in what follows a study and an analysis on the requirements of ISO 9001 V 2015 and the processes of the PMBOK. Indeed, ISO 9001 specifies requirements for a quality management system, it comprises 10 articles [15]. For the implementation of a SMQ ISO 9001 V 2015, it is important to be in conformity with the requirements. So our study and analysis will be focused on the 7 chapters of the standard. However, the PMBOK is a guide, which provides the guide for the project management [14]; the first two sections of Guide PMBOK present an introduction to the key concepts of the field of the project management. Section 3 summarizes the groups of process and provides an overall picture of the interactions between the processes, the 10 fields of knowledge and the 5 groups of process.

We find the corpus of knowledge in project management in sections 4 to 13; it consists of 10 fields of knowledge, 5 groups of process and 47 processes. We expose in TABLE VI the projection of the requirements of the fourth chapter of the standard on the practices of the project management according to PMBOK:

TABLE VI
CORRESPONDENCE BETWEEN ISO 9001 (CHAPTER 4) AND PMBOK

Under Chapter	Requirements	Correspondence PMBOK
4.1 Understand your organization and its unique context	Identify and understand your organization's context Monitor information about your organization's context	4.2 Develop Project Management Plan 4.4 Monitor and Control Project Work 11.2 Identify Risks
4.2 Clarify the needs and expectations of interested parties	Identify the parties who affect or could affect your QMS Clarify and understand their unique needs and expectations. Monitor and review information about your interested parties.	4.4 Monitor and Control Project Work 5.2 Collect Requirements 13.1 Identify Stakeholders 13.3 Manage Stakeholders Engagement 13.4 Control Stakeholders Engagement
4.3 Define the scope of your quality management system	Clarify boundaries and think about what your QMS should	4.1 Develop Project Charter 4.2 Develop

	apply to Document the scope of your quality management system (QMS) Maintain the document that defines the scope of your QMS.	Project Management Plan 4.5 Perform Integrated Change Control 8.1 Plan Quality Management 11.2 Identify Risks 13.3 Manage Stakeholders engagement 13.4 Control Stakeholders Engagement
4.4 Develop a QMS and establish documented information	Develop a process-based quality management system (QMS) Implement your process-based quality management system Maintain your process-based quality management system. Improve your process-based quality management system.	4.5 Monitor and Control Project Work 5.2 Define Scope 5.4 Validate Scope 5.5 Control Scope 6.3 Estimate Activity Resources 8.1 Plan Quality Management 8.2 Perform Quality Management 8.3 Control Quality 9.1 Plan Human Resources Management 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses

Analysis table shows that standard project management tools and practices are used in the implementation of the requirements of ISO 9001 V 2015. In addition, ISO 9001 apply process approach which integrate quality circle PDCA (Plan, Do, Check and Act) and risk approach. The elements which constitute these approaches are cited by guide of project management PMBOK, such as, planning process, executing process, and monitoring and control process. Also, all paragraphs of the standard ISO were elaborated by taking account of the standard ISO 10006 [15], so ISO 9001 uses ISO 10006. Moreover, the standard ISO 10006 counts 10 families of process implemented in Project Management. We notice that this standard is strongly inspired by the guide PMBOK because the principal objectives of ISO 10006 are very similar to the processes of PMBOK, we cite: strategic process, coordination process, scope process, time process, cost process, resource process, human process, communication process, risk process and procurement process [16] & [17]. Considering the importance of the practices of the project management, ISO worked out in 2012, besides ISO 10006, the 21500 standard presents the management project practices and therefore it has a strong connection in ISO 9001 V 2015 implementation such as ISO 10006 and ISO 10007. ISO 21500 "Guidance for project management" is the step

towards the true world standard for project management [18]. It could be said that the ISO 21500 was created as an answer to the growing globalization of the projects. Karl Best, Secretary of the project committee, comments: "In an increasingly global economy project managers need guidance to help them understand the basic principles of managing projects. ISO 21500 can help those involved in projects improve the success of a wide variety of project types such as SMQ ISO 9001 V 2015". ISO 21500 and the PMBOK are complementary and necessary to the profession of the project management; they are similar and can be associated [19] & [20]. The PMI, which is the first worldwide association for the managers of projects, took records publication of the ISO. He was pleased with the alignment of the document with his Guide PMBOK. PMI played a paramount role in the development of the ISO 21500. It was useful as a secretariat of the ISO committee, during the five years, of development of the standard.

Studies were carried out to compare this ISO standard 21500 with what the PMBOK of PMI proposes to us, we note that the main difference is that ISO 21500 does not provide description of tools and techniques [21]. The description of each process in ISO 21500 consists of general description and a table containing primary inputs and primary outputs. ISO 21500 descriptions are also substantially shorter than those of PMBOK Guide. In fact ISO 21500 describes 39 processes on 36 pages of guidance for project management, where 47 processes of PMBOK are presented on over 600 pages of the guide. The important consistency between the PMBOK and the ISO standards 21500 will definitively help the profession. It will definitively let a lot of organizations to align their project management processes toward ISO recommendations. This mutual contribution is likely to continue since a new technical committee has been set-up to deal with program and portfolio management. And the organization of this new committee is the same than the committee producing the ISO 21500 standard. This might also lead PMI to certify portfolio managers in the future and PMI confirms its leading position to certify program managers, project managers and associates. In the future, if ISO 21500 becomes the basis of a certification, there will be an advantage for companies to have PMI certified project and program managers onboard.

III. CONCLUSION

The project management became a market except for whole having a significant impact on the success of the projects. The guide of the project management according to PMBOK or ISO 21500 is related to the text of the standard ISO 9001 V 2015. And the results exposed in this report show that the implementation of the SMQ ISO 9001 V 2015 is a project which rest on the use of the tools and techniques based on the practices of the project management. This lets us deduce, that the project management can present an opportunity for the implementation of Management System like Quality Management System.

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