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Original Paper

The Impact of American Petroleum Institute Certifications in Quality Management Systems: Analysis of API Spec Q1 and Q2 Certified Organizations

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Abstract

The present study aims to provide initial insight into the quality management system. More precisely, it describes whether and to what extent implementation of Quality Management System according to API Spec Q1 and/or Q2 can impact various companies in the oil and gas industry. A sample of international organizations is surveyed to understand how certifications affect organizational culture, passing through elements such as competitiveness, reputation, organizational performance, costs, and others. In addition to the certification itself, a rigorous and challenging process of implementation, review, restructuring is carried out, involving fundamental elements of the organization. During this stage, technical support becomes essential for a productive consolidation of the required requirements, and later, the improvement scenario is indispensable to maintain all the success factors in order to consolidate a quality management system within the organization. Thus, based on the findings, companies in the oil and gas segment may identify and reflect on the certification benefits to improve their approach to quality management systems, given the observations of managers and operational interviewees.

Keywords

Quality Management System, API Spec Q1, API Spec Q2, Organizational performance

1. Introduction

The market and the organizations' scenario are undergoing so many transformations that companies are increasingly concerned about how to compete within this context. Companies must adapt themselves to the needs that market presents. Thus, the application of Quality Management and its concepts seek to achieve a macro vision, so that it also involves: production control, quality of goods and services, and adequate technical assistance. In this sense, the concept of Quality Management has become a management model for those seeking efficiency and effectiveness in the company (Maximiano, 2004).

American Petroleum Institute (API) is responsible for defining quality management systems for organizations and it was formed in 1919 as a standards-setting organization, among other roles in the oil and gas industry. Nowadays, it is a global leader in bringing together subject-matter experts from all segments to establish, maintain, and distribute consensus standards for the oil and gas industry. In its first 100 years, API has developed more than 700 standards to improve operational safety, environmental protection, and sustainability with worldwide applicability across the industry.

Among the more than 700 standards developed, API Spec Q1 and API Spec Q2 standards will be considered for this study. These are specifications applicable to manufacturing and service organizations in the oil and gas industry that declare conformance with the requirements of the standards and request evaluation by the institute for certification and surveillance of their quality management systems. This paper is based on semi-structured interviews conducted with sixteen research subjects from companies in the oil and gas sector, among which seven are managers, two from two organizations, and three managers from the same organization, leaving nine operational interviewees. The focus of the qualitative research was to analyze the impacts perceived on team performance after implementation of Quality Management System according to API Spec Q1 and/or Q2.

Thus, this article seeks to analyze the influence of certifications on the perception of organizational management systems, as well as to emphasize the need to focus before, during, and after certification, so that continuous improvement is maintained and consolidated within the organizational climate, influencing the market in question.

2. Literature Review

To understand what quality management systems are, it is relevant to observe the definition of each of the terms according to scholars and related standards. According to the Michaelis (2021) dictionary, one of the definitions of a system is defined as “the interrelation of units, parts, responsible for the functioning of an organized structure. And the term management is defined as the act of managing or administering”. According to the ISO (2021) 9000:2015 standard, “the quality of products and services includes not only their intended function and performance but also their perceived value and benefit to the customer”. Two other important concepts for understanding the theme presented in this work are defined by this standard. One is compliance: “meeting a requirement” and the second, is process: “set of interrelated or interactive activities that transform inputs into outputs”. A Quality Management System (QMS) is a system that documents the policies, business processes, and procedures necessary for an organization to create and deliver its products or services to its customers, and therefore increase customer satisfaction through high product quality.

The history of quality management goes back to the guild system in medieval times, with master craftsman status representing higher quality goods and services, passing the period of the industrial revolution, where quality evolved to focus on factory inspections and removing defective goods. By the

20th century, more specifically 1911, mechanical engineer Frederick Winslow Taylor published The Principles of Scientific Management. Taylor was one of the first to study manufacturing efficiency (Weckenmann, Akkasoglu, & Werner, 2015).

In this way, focus shifted to team and dynamics, solving problems through a continuous improvement cycle, regarding sustainability transparency, aiming to maximize customer satisfaction as increasingly tied to these factors. Based on the history of the mentioned concepts, it is understood that an organization has several processes that are interrelated in favor of its main process, which is the transformation of customer needs into conforming services and that quality management systems are processes that interrelate in order to meet the specified requirements to increase the satisfaction of stakeholders in the organization (Combs, 2006).

In 1986, the American Petroleum Institute released the API Spec Q1 for quality management for manufacturing organizations in the oil and natural gas industry. API Spec Q1 meets many of the requirements of ISO 9001, plus additional elements deemed valuable by the oil and natural gas industry, and is now in its ninth edition, released in 2013. API Spec Q1 registered companies demonstrate to their customers that can provide reliable products and related manufacturing processes that meet legal and customer requirements (API -American Petroleum Institute, 2022).

With a significant foundation in risk management, the standard addresses, among other topics: the “process approach” for quality management; quality objectives; management responsibility; competency requirements; control of documents and records; design and development; contingency planning; management of monitoring, measuring and testing equipment; change management; customer satisfaction process; internal audits; corrective action and root cause analysis (API -American Petroleum Institute, 2022).

In addition to addressing the topics mentioned above, API Spec Q1, as it is directly related to manufacturing companies, makes it possible to certify products through the API Monogram Program. Monogram API is a voluntary licensing program that facilitates the manufacture of products in conformance to applicable API specifications. Licensed manufacturers have the authority to apply the API Monogram trademark to products that meets the requirements (API - American Petroleum Institute, 2022).

API Spec Q2 is the first international quality management system (QMS) standard for exploration and production service providers serving the oil and gas industry. The industry-written specification applies to critical activities such as construction, intervention, production, abandonment, well maintenance, equipment repairs and maintenance, and well inspection activities (API -American Petroleum Institute, 2022). Organizations registered in compliance demonstrate to their customers that they have a QMS that controls their operational processes, provides consistent results, manages change effectively, continuously improves, reduces operational downtime, and increases customer satisfaction. API Spec Q2 standard fulfills an industry gap for service delivery organizations. Its development started in early 2010 to reduce risks and improve service quality. Work on Q2 accelerated after the Macondo incident,

and the standard was officially published in December 2011. Certification for Q2 began in late 2013 after a two-year beta test period and remains in its first edition (API - American Petroleum Institute, 2022). Like the Spec Q1 API, the Spec Q2 API was designed with a significant foundation in risk management. The standard addresses, among other topics: The “process approach” for quality management; Quality objectives; Management responsibility; Competency requirements; Control of documents and records; Design and Development; Contingency planning; Management of monitoring, measuring, and testing equipment; Change management; Customer satisfaction process Internal audits; Corrective action and root cause analysis. It is important here to point out ISO 9001, which, although not the standard and reference analyzed here, is a relevant management system that aims to guarantee the optimization of processes, greater agility in the development of products, and more agile production in order to satisfy customers and achieve sustained success (Lee et al., 2009). The ISO 9001 standard began in 1987 and since then it has undergone several changes, some minor, correcting small details, and others with major changes that took place in 2000 and 2015, is internationally recognized for defining the requirements necessary for the implementation and certification of the management system. the quality of an organization, of any segment or size (Lourenço et al., 2012). Given this normative historical panorama, it is argued that quality system management is fundamental for the development of industrialization (Carvalho & Miguel, 2012), increase on-time delivery, reduce risks, attract bigger customers, and, progressively, the search for certification using this benchmark gives confidence and facilitates access to world markets, and its popularity continues today. The article seeks to highlight how APIs impact the performance of companies, given the perception of employees in the oil and gas area that has been going through a rigid process of preparation and qualification. The change in the performance of companies is such a more careful analysis required, both of the external elements to the business environment, as well as those internally related in this process (Kaziliūnas, 2010), impacting advanced manufacturing technology on companies’ organizational structure (Ghani et al., 2002).

3. Method

The data used in the present study were collected between September 2021 and November 2021, and it was obtained through interviews conducted with sixteen research subjects. The field research was applied in three organizations located in the city of Macaé, the national oil capital, in the state of Rio de Janeiro, Brazil and one organization in Esbjerg, which is Denmark's energy metropolis and offshore capital with more than 250 companies doing business in offshore oil and gas and the offshore wind industry. These defined organizations have, in common, the provision of services and products for the oil, gas, and energy industries and the implementation of their management systems according to API Spec Q1 or API Spec Q2 standards, and therefore were chosen to integrate the empirical field of research, since the present author had easy access to companies and interviewees, by working in this sector. These companies were chosen because they are large companies already consolidated and recognized in the oil services market, institutions governed by a similar career plan, which have

undergone a recent certification process, either API Spec Q1 and/or Q2, and due to their international reputation. The choice of all interviews and subjects had as defining parameters, their functions in the sectors of operations, supplies, and quality management system. The definition of the sectors was due to the representativeness and potential impact of these departments for quality management systems since operational sectors are directly related to customer service and satisfaction.

The issue of quality management systems was considered following the standards studied, with customer satisfaction being directly related to compliance with legal, customer, organizational, and any other applicable requirements. Supplies, in turn, play an important role in the supply of inputs and the management of the supply chain, with special attention to critical suppliers with a potential impact on the provision of services and the provision of final products. The sector responsible for the quality management system was also selected due to the nature of the leadership activities in the implementation and maintenance processes of the organizations' quality management systems.

The collection method took the form of a questionnaire, using N Vivo software to assist in the data processing. It is essential to emphasize that the software was used considering its numerous functions, namely the patterns found through specific questions, enabling the analysis of emerging themes and the withdrawal of interpretations and conclusions based on evidence. The study is predominantly qualitative, considering a representative choice of Global Corporate Solutions customers who use API Spec Q1 and/or API Spec Q2 standards as references for their quality management systems. Once the questionnaire had been constructed, it was pre-tested aiming at the best possible data collection, as recommended in good research practices, which consisted of carrying out two test interviews to verify the interview time, as well as the consistency of the questions and answers. One of the points identified in the test was the difference in perception of employees who are responsible for managing quality management systems versus employees directly linked to production, which reinforces the need to include this audience in the research, understanding the different perspectives, as well as the motivating factors for the actions of these different audiences.

Considering the research objectives, the questions were perceived as appropriate and consistent, both by the interviewees and the researcher. Respondents showed to be at ease, responding calmly and with interest in the researched topic. Therefore, the subsequent and definitive interviews followed the revised model, collecting the data necessary for the study.

4. Result

In this section, the descriptive findings of the survey are presented, starting with some general information regarding the participating organizations.

Table 1. Overview of Respondents

Interviewee	Office	Company size*	Company**	Manager (M) or operational interviewee (O)
Respondent 1	HSEQ Assistant	Large	A	O
respondent 2	Maintenance Officer	Large	A	M
Respondent 3	Buyer	Large	A	O
Respondent 4	Operations manager	Large	A	M
Respondent 5	Project Engineer	Large	A	O
Respondent 6	Senior Vice President of Design, Development, and Manufacturing	Large	A	M
Respondent 7	Buyer	Large	B	O
Respondent 8	Trainee Engineer	Large	B	O
Respondent 9	Completion Engineer	Large	B	O
Respondent 10	Operations coordinator	Large	B	M
Respondent 11	SMS Manager	Large	B	M
Respondent 12	Quality inspector	Medium	C	O
Respondent 13	industrial designer	Medium	C	M
Respondent 14	Manufacturing Manager	Medium	C	M
Respondent 15	Buyer	Medium	C	O
Respondent 16	Quality Analyst	Medium	C	O

Source: Prepared by the author, 2021.

*The criterion adopted to define the size of the company was based on studies by the Brazilian Institute of Geography (IBGE, 2019) based on the number of employees it has. Thus, the following classification is obtained:

Industries:

- Microenterprise: up to 19 employees;
- Small business: from 20 to 99 employees;
- Medium-sized company: from 100 to 499 employees;
- Large company: over 500 employees.

Trade and provision of services

- Microenterprise: up to 9 employees;
- Small business: from 10 to 49 employees;
- Medium-sized company: from 50 to 99 employees;
- Large company: more than 100 employees.

**For reasons of secrecy, the division of companies by letters is placed here, protecting the data of the interviewees, only informing the identification of the employees of the same companies.

It is imperative to point out that the questionnaire used during the interviews was the diagnostic instrument applied to the research subjects and can be used by companies to identify levels of engagement, thus collaborating later in the implementation or maintenance of their management systems.

Analysis of the benefits of certifications by the organizations

Certifications and the QMS are essential for companies, but throughout the interviews, it was found that all respondents unanimously, at first, attributed this to being a guide to them and, in the course of the conversation, attributed this importance due to the benefits involved, such as improvement in quality, in the relationship with customers, the reputation of the corporation, enhancement of internal communication, increase in sales, demand from suppliers, an initiative of top management. According to manager 2:

> (...)There are documents, procedures for everything relevant. Working undercover is much more comfortable, it gives you more confidence to make decisions, it is good for following the procedure and if something goes wrong upfront, it was because of the condition of the operation and not a mistake.

Kaziliūnas (2010) makes clear the importance of aligning quality programs with business strategies to ensure that efforts reflect the long-term goals of an organization, involving top management to set priorities in an appropriate resource allocation during the design and implementation. Thus, the focus on continuous improvement of processes are critical factors for a prolific quality management system, which is described according to an operational interviewee 3:

> (…) I think our system has improved after the API yes! Some things became clearer, others a little more work, more detailed, but we managed to see a significant change.

API Q1 and Q2, as well as other management standards, help organizations involved in the oil and gas market to establish more consistent and standardized processes, thus raising the level of the organization and the quality of its products. Something essential for any type of company. In addition, when requiring equipment repairs, many industry organizations that previously only turned to manufacturers are opening the market to local repair and remanufacturing organizations that meet quality requirements based on API Q1. With the specification, repair organizations and remanufacturing are increasingly structured, so that they meet the same quality criteria as manufacturers and can ensure the quality assurance of their products, as Bianchi and Ferraz Junior (2020) propose. Manager 13 points out that:

> (…) The quality, in general, has grown with better customer service and this gives us a great deal of reliability towards the customer. The API system is very important to generate reliability for the client, to do the right things, and show who and how it is being done. Because it is not enough for you to do it right, you have to show that you are doing it and this evidence end up producing changes and benefits in the employees themselves, in the operators, a very large margin for professional growth, because systematic methodologies is important in the oil and gas. It ends up

> becoming part of the culture regardless of the time. The moment you have to do it, it "stays in the blood". It's fantastic! We had a very big evolution within our system.

Tari et al. (2012) evidence that the certification attracts investors, brings greater effectiveness in processes and activities, by following the established rules in their management. Activities such as the development of metrics for the provision and product realization, identification of the appropriate sequence for a series of activities, application of changes/corrections in processes are some examples of activities that are beneficially impacted by obtaining certifications. Within this process, Lee et al. (2009) argue that certification based on international standards works as a strategic instrument, helping into the competitive market that organizations are inserted. Covering items such as internal quality audits, design review, inspection and testing, document and data control, corrective actions, process control and order review, Spec Q1 and Q2 make a difference in the organizational environment, is associated with improved performance, in which success is normally achieved through the joint effort of all departments and processes of the organization (BABATUNDE, 2020). Weckenmann et al. (2015) contribute to this discussion exposing that the top management needs management to set priorities in resource allocation during the design and implementation, reflecting the long-term goals and therefore, aligning quality programs with business strategies. Manager 11 highlights this issue by stating that:

> (…) The API standard makes a very big change, mainly on the supplier side, before Q1 implementation our procedure was very simple. We could meet ISO standards and with the implementation of Q1, we had a very big change in the way we worked. We had the ISO implemented where the quality control part was very simple. Few documents, few controls and we were able to meet the standard. When we move to the API, whether Q1 or Q2, we need to implement several aspects, mainly in terms of the quality of product delivery or service to our customers.

Thus, the elements cited by Tari et al. (2012) are observed as the classification into three categories: external benefits regarding marketing, reputation, growth of customer and investor market; relations benefits regarding customer, competitiveness and internal benefits that include organizational performance, costs, and others, as the table below summarizes.

Table 2. Frequency of the most Recurrent Words of Respondents (both Managers and in the Operational Area) Referring to Certifications Taken from N Vivo

Words	Score per word	% per word
Adequacy	52	5.04%
Opportunity	41	3.98%
Safety	38	3.69%
Competitiveness	36	3.49%

Difference	34	3.30%
commitment; leadership.	32	3.10%
awareness; culture.	28	2.72%
Apprenticeship	26	2.52%
Details	25	2.42%
Unity	22	2.13%
information; integration.	20	1.94%
efficiency; organization; productivity.	19	1.84%
Quality	18	1.75%
balance; evolution.	16	1.55%
concentration; systematic.	14	1.36%
Improvement	13	1.26%
audits; autonomy; clarity; charges; trust; strategies.	12	1.16%
commitment; procedures; system; transparency.	11	1.07%
pattern; costs; reputation; unit; filter.	10	0.97%
constant; discipline; standards; procedure.	8	0.78%
engagement; management; restructuring.	7	0.68%
ripening; appointment; performance; effort; incentive; need .	6	0.58%
activities; differentiated; marketplace; specialized; time; work.	5	0.48%
to be continued; challenge; day; efficient; integrated.	4	0.39%
high; evaluation; trust; consolidated; contracts; demands; rigor; company; example; providers; mapping; hand; constructions; performance; problems; qualified; tasks; transformation.	3	0.29%
learn; consequence; contract; cooperation; proud; demand; wear; diversity; difficulty; to educate; encouragement; energy; structured; parameters; hierarchy; indicators; initiatives; interruptions; improved; motivate; motor; qualification; resources; repetition. result; routine; velocity.	2	0.19%
collective; sharing; comfort; regulations; definition; development; difficulty; doubts; effectiveness; expertise; ethic; revenues; functions; historic; data; metric. organization; peace; positive; pressure; sequencing. support; assignment; barrier.	1	0.10%

The table shows a collective understanding that API certifications, whether Q1 or Q2, involve complex factors, details, and standards that are rigorously applied. One interviewee points out that:

> (…) We had an upgrade in this very big part, it demands a lot from this part. We are in an API certification process and before we had no standards, no procedures. We have to keep it that way for us to maintain a line of reasoning, of operation, and today we have it. We also have all this history that we are doing because of the suitability of the API itself. We were able to search for

> information, for example, we had a problem in the well, in the operation, but we were able to search here inside the base what happened until the tool arrived and before we had none of that. And before that, we were not aware that a lot needed to be done so that we could reach an ideal standard, and today both the operation and the administrative area can look at the processes better, they became clearer, more homogeneous.

Psomas et al. (2010) demonstrate critical factors for the effective implementation of the international standards of norms, illustrating this sense of differential addressed by the previous quote, identifying in this way, fundamental areas for effective implementation of the quality standard. Inside the oil and gas industry, any unplanned downtime affects the bottom line, in this way, reducing risks is a key factor that is considered by certification, as well as delivery on time, following strict inspection, and calibration standards, reducing costs, and increasing a sense of control in all phases of the processes (Combs, 2016).

After, during, and post-certification period: need to focus on continuous improvement and consultancy support.

Although in the initial stages employees reported difficulty and resistance to change and compliance with strict requirements, managers demonstrated that after employees observed improvements, the behavior of the latter changed. According to the M10:

> (…) As soon as the employees saw the improvements and started to see the changes as new challenges to be faced, they reinvented the motivation to get out of the comfort zone and created a routine, new flows to follow in the development of activities.

Thus, in the interviews, it was observed that in addition to a mere execution and expectation that everyone adapts and interacts with the system, a more attentive view of the difficulties and possible impediments to full use and absorption of the activities of the new system is necessary system.

Therefore, after a period of adaptation and with clarification and information about the system, it becomes a consequence of engagement and motivation of employees in using the system, since employees observe the benefits of the same, such as improvement in efficiency, billing, productivity, commitment, organization of data, equipment, generating a process of improvement and constant evolution. Contributing to the classification of Tari et al. (2012), Poksinska et al. (2006) argue that as an external element, certification is used as a marketing tool, is evidenced in the speech of the manager 14:

> (…) In relation to API certification, I think that makes them proud. Before, I used to tell them that there was no other company like it, that we would be unique. These examples create pride in them. Although API Q1 and Q2 contribute to this perception of improvement, external credibility.

Llopis and Tarí (2003) argue that a holistic view of the process, which sees certification as a step towards constant improvement of internal issues, the organization tend to better results than companies that only focus on the reputation that certification brings.

Nanda (2005) contributes to this discussion regarding the post-certification period stating that the

improvement stage is fundamental to keep all the benefits, of an established and consolidated quality management system in place. It is important to emphasize that certification is only the starting point for the organization to guide its processes according to the reference standard. The great challenge is to maintain these in order to achieve continuous improvement, through the involvement of the organization and the commitment of the top management and its representatives. Manager 14 points out the need to keep the focus on quality, in certifications that are fully focused on the implementation of consolidated processes and results, also describing the differences between the API and ISO standard:

> (…) But it's very clear when you compare ISO and API requirements, it's a very big difference. ISO is more concerned with maintaining certifications, with keeping everything running. For the last 3 certifications, we did not have any non-conformances. No matter how hard I try, I will always have a non-conformance and it is a good thing I do. I won't improve if I don't have any nonconformities. Now when you talk about API, you can't say, for example, that it doesn't need heat treatment, because you know that part needs heat treatment, while ISO doesn't realize that. When you start working with it, this aspect alone changes a lot and when you start to fulfill the requirements that seem to be more bureaucratic, everything flows. The ISO and API comparison say the latter is more bureaucratic, but it is no longer bureaucratic within the needs and requirements. Did the API require certain points that we didn't have? It demanded. We found that some items in our product failed, we found out with the API. Another point: they choose auditors, their expertise, the requirement of the API to train its auditors. My system had to change a lot in the raw material, I have to have resistance and chemical analysis: I have to buy the raw material with a certificate (which takes longer) or I have to take the chemical sample and send it to the laboratory and do it. All raw materials are analyzed, everything has been recalculated.

Gardner (2002) shows that managers must be included in these processes, consolidating a culture of quality, continuous improvement, which for Carpinetti (2012) to conquer markets and remain competitive, it is necessary to respond positively to customer requirements regarding products and services. In other words, quality management becomes part of the organization's competitive strategy, generating questions in managers, such as: what are the attributes of a product or service that make them more attractive and that most interfere in the decision to purchase the product or service? Manager 14 highlights this point by exposing that, as in a virtuous cycle, with the leaders encouraging employees to use the quality system and greater certifications, there is, consequently, a generation of new contracts. In the words of operational respondent 12:

> (…) If you do not certify, there is no contract, if there is no contract, there is no company. They are motivated, and I think certification brings that. Behind certification, a complex process of readjustment, implementation, review is carried out.

Silva and Melo (2017) demonstrate the role of consultancy and certification services related to Quality Management, arguing that consultancy is a key service to maintain improvement and to assist strategic decision making, supporting managers, and contributing to the core of the organization.

When asked about the impacts on team performance after implementing the QMS according to API Spec Q1 and/or Q2, manager 6 responds that:

> In fact, I'm almost certain that the results are adjustments, improvements in terms of critical suppliers, we received the last push in the KPI (which can be translated as Key Performance Indicator), we had an increase in performance. Not only did we have a better performance from the team, but it also became clearer to everyone what to do, why we do it. It's important to have consultants like Global. Two years ago, I started alone with some knowledge that I had, but it is necessary to document more, to have another consulting company that has the experience, extensive knowledge of this specific area. Looking back, I would never have made it, because it takes a lot of technique.

In this specific interview, as it is a manager and leader in a high hierarchy, the vision brought is fundamental because it demonstrates a very clear look at the need to implement the QMS and consultative and theoretical support for the control of the processes, organization of the company, better performance, in the area of manufacturing products.

Schmuck (2017) complements that Management Consulting allows paths and processes that previously seemed impossible to become easier to enter, but with a technical look and focused on specific improvements and requirements, they provide contracting companies with security and agility in the process of implementation of international standards. In this way, a macro view, from before certification, through during with the choice of consultants and technical support until post-certification makes all the difference, as Bianchi and Ferraz Junior (2020) argue, neglecting these steps lead to a lack of commitment and indifference by the organization, through top management to the other sectors, inadequate culture and resistance to change. Following this line of reasoning, operational interviewee 8 explains that the improvement is gradual, constant, in which, through cooperation, discipline, and teamwork, transformations will be collectively experienced, reverberating in the quality of the company as a whole (Kaziliūnas, 2010).

5. Conclusions

The present research aimed to analyze the influence of certifications on the perception of organizational management systems, more specifically following API Spec Q1 and API Spec Q2 standards, as well as the consequences in the consolidation of the culture of quality in oil companies. The unanimity of the interviewees, whether managers or from the operational area highlighted a difference in the performance of several areas after the API certification was implemented and consolidated in the system. Businesses can improve customer satisfaction, increase revenues, reduce risks and rework, once that ensure that requirements are understood, become more marketable, efficient, competitive. In addition, the reputation and view of the oil and gas market on this company are positively impacted. In addition to the various benefits mentioned, in this certification process, it is fundamental to rely on consultants who have experience and extensive knowledge of this specific area, who can facilitate the

implementation and adaptation of this system. Furthermore, the focus on improvement must be constant, with certification being a kick-start for the deepening and experience of all the points established and learned. Taking greater investment development as a priority, the organization as a whole will benefit, through a good strategy based on quality. From a practical point of view, this article may be of interest to managers, directors not only to obtain information regarding the benefits of API Spec Q1 and Q2 but also an incentive for continuous specialization, highlighting the results to employees, in a way that to create an organizational culture focused on quality.

6. Discussion

Due to the analytical focus, the research found it impossible, in this study, to carry out an in-depth comparative study between other management system standards and other management systems. Therefore, we emphasize here the need for further research to focus on these discussions, in order to question how a more general and less rigid certification can learn from a more complex system and vice versa, reinforcing the theoretical universe and pragmatic quality management system as a whole.

In addition, further studies can exploit the result of this qualitative research to carry out quantitative research with a larger sample of companies and respondents, as well as specifically address the relationship between ISO and API standards, which was incipiently portrayed here, as per a citation of a manager, but which may be the subject of future inquiries.

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