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RESEARCH ARTICLE

Quality Management Systems That Serve the Subsea Oil & Gas Industries: Strategic Business tool or a Marketing Badge

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Abstract:

This research project was to investigate the motives for gaining an ISO 9001 certified quality management system in companies that serve the subsea sector of the oil and gas industries: is certification a strategic business tool or just a marketing badge? A literature review revealed that if implemented rigorously, ISO 9001 could deliver increased efficiency and improved business processes. Many authors stated that certification was gained principally to allow trading in the European and global markets, and, to gain entry to the Approved Vendors List of prospective customers. Primary research consisting of interviews with approximately 55 professionals across 12 organisations indicated that a majority agreed, stating that certification was gained for marketing purposes or to satisfy customer requirements. However many went on to say that their companies had subsequently realized the full benefits of ISO 9001. Therefore the motives for certification could be aligned. Secondary research also revealed that a number of firms operated an integrated management system. Findings of this project point to two conclusions. First, if ISO 9001 is implemented rigorously enough, companies can realize its benefits despite alternative reasons for gaining certification. Second, both motives for gaining certification can be aligned. This is a significant that is absent in the literature. All of the companies operating in this industry that were researched in this study had an ISO 9001 certified QMS.

Because of the absence of publications on the use of ISO 9001 in the subsea sector of the oil and gas industries, further research into the possible alignment of the motives investigated in this project is warranted, and recommended. Additional areas for further research include integrated management systems rather than ISO 9001 quality management systems and limiting the scope of analysis to a current single subsea project, such as the Gorgon Project (Hatch 2013).

Keywords: Quality Management Systems, Marketing, Business Strategy.

Introduction

ISO 9001 is designed as a business improvement tool, yet it is often adopted by firms as a marketing badge; the result can be ambiguous and problematic. Firms within the subsea sector of the oil and gas industries, especially junior partners in the supply chain, sometimes seem to be more motivated to gain certification for the marketing awards as opposed to the business benefit (MSCM, Participant Observation 2012). In his own literature, John Seddon claims to have "built his reputation being anti ISO 9000" (Seddon 2002). He criticizes ISO 9001 certification, believing firms only gain certification because it will enable them to trade on the European and global markets. Similarly, Dadoun (1992) states that the European Community (EC) countries have adopted ISO 9001 as a management tool to eliminate barriers. However, Hoyle (2009 p.1) asserts that certification will help an organization to achieve its goals; he offers one of these as being "to help make the business more profitable by reducing waste and streamlining its business processes." Kemp (2006 p.92) also emphasizes the benefits when he states that "quality management will assure and increase value for customers and firms."

The primary aim of this study is to investigate the motives for gaining an ISO 9001 certified quality management system (QMS) in firms that serve the subsea sector of the oil and gas industries. The motives are two-fold. First, ISO 9001 certification is a well publicized requirement for trading in the global market (Evans and Lindsay 2002 p.132, Love and Li 2000). Second, the implementation of such a system should in essence, achieve substantial business rewards and as such, should be a strategic business decision (Kemp 2006 p.92). As a result, firms' motives for pursuing certification can be clouded.

Rationale

From an academic perspective, the primary reasons for this project are:

- To carry out a detailed investigation to gain a better understanding of quality management systems, and to investigate how they are

applied in organizations that operate in the subsea sector of the oil and gas industries. The conclusion of this investigation would purport to the reasoning behind certification in this sector, at least for some firms.

- To update current literature, as the most recent text books and journals do not directly delve deeply into the organizations that serve the subsea sector of the oil and gas industries.
- To identify a different approach to aid understanding behind the motives for certification.
- To add to the knowledge that is already in the public domain regarding certification in this industry sector.

From a business perspective, a deeper insight to the motives behind certification was important to explore. In particular, this project examines the following benefits yielded by certification:

- Certification is primarily sought for marketing purposes, and for obtaining placement on a prospective customer's approved vendor's list (Love and Li 2000).
- Certification is implemented as a strategic business tool, to improve a firm's efficiency and effectiveness, to reduce waste, and thus endeavour to make the firm more profitable (Barnes 2000).

Other factors prompting certification may be competition and new entrants to the industries (Porter 1979). Continual improvement (Ortiz 2009) is one of the ISO 9000 quality management principles (ISO 9004:2009), and the ever changing business environment makes the business aspect of the rationale pertinent (Worthington 2006).

Importance & Relevance

The growth of ISO 9001 certification in recent years, coupled with the pervasive influence these natural minerals, oil and gas, have on the daily lives of most people, (Kaiteur News 2012) contribute to the importance of this research. The subsea sector of the oil and gas industry has increased exponentially in the last two decades (Smith et al 1976) and this growth is expected to continue as discussed by Christie (2012). The enormity of the firms that operate in these industries, such as Chevron (Nash 2012), also lends importance of topic for quality professionals, organisations and business. Quality management systems are an important element of a management structure (Hoyle 2009 p.86).

Finally, during a search of publications, it was apparent there are few that focus on the subsea sector of the oil and gas industries (Jones et al 2007). This fact alone illustrates the importance for research into this subject.

Objectives

In firms that serve the subsea sector of the oil and gas industries, the two main reasons for gaining an ISO 9001 certificated QMS are:

- For marketing purposes and to enable a firm to trade within the European and world markets; this is because it is becoming an intrinsic requirement of prospective customers (Hoyle 2009, p.93)
- As a strategic business tool that will streamline a firm's business processes and improve its operating effectiveness and efficiency (Kemp 2006 p.92)

To investigate these motives, this project focused on the following objectives;

- Survey the use of ISO 9001 in the industry sector.
- Analyze and consider the two primary motives for gaining ISO 9001 certification: strategic business tool or a marketing badge?
- Conclude if these motives could be aligned and integrated
- Evaluate the benefits and limitations of certification
- Draw conclusions on the motives behind gaining certification

These initial objectives could lead into other areas for investigation, such as the difficulties certification presents to a firm, how to gain certification at a cost that benefits the firm that is using it as a badge for doing business and specific difficulties when operating in this industry sector. Further areas that were expected to be discovered were the alignment of the motives set out in the problem statement and, integrated management systems (IMS), which are a feature of many companies' business management systems. It is expected that during the literature review phase of this project, IMSs will feature in the companies researched.

Methodology

Several research methodologies were employed to complete this project, including, a literature review, a detailed survey, participant observation, internal and external audits, and detailed interviews. The methodologies were both qualitative and quantitative, and the data gathering phases covered both primary and secondary research data.

The interviews were carried out mainly in the workplace of the author, and of suppliers to the author's employer during external audits. A questionnaire was utilized so that a set of standard questions would return data that, when it came to the analytical stage, were simple to understand, and as such, would easily lead to conclusions. Many interviewees were known to the author, and many were colleagues and former colleagues. A total of fifty-five people were interviewed, which presents a constraint, considering the size of the industry. Results may not be indicative of the industry as a whole. However, the information that was returned was easily grouped, and the findings are believed to be of an authentic nature.

In addition to the interviews, a survey was sent to three hundred and ten people. A return of ninety-six, although a relatively low number, still provided good information. The survey questions, similar to the interview questions, were of a simple and standard format, offering respondents little opportunity to deviate from the research intent. The survey questions were an excellent source of

information that endorsed information collected from the interviews. In total, twenty questions were posed. A short survey was deemed a more positive way of maintaining the respondent's attention. This was also believed to be a factor in the number of returned surveys. The findings from the survey are annotated throughout this report as "O'Donnell's survey."

Participant observation was an ideal method for the author to gather primary research data from "real life" situations. Typically, these situations were encapsulated during internal and external audits. The auditees were informed of the situation, only willing participants are covered in the reported findings. No information was used from auditees who were not willing participants.

Literature Review

Hoyle's *ISO 9000 Quality Systems Handbook* (p.93) explains that many firms have been driven to gain ISO 9001 certification by pressure from prospective customers; certification is for the purpose of doing business as opposed to improving business processes. Similarly Kemp (2006 p.193) explains that although ISO 9001 now operates in a world-wide market, it is centred in Europe, and this encourages the "gradual economic and political unification of European countries." Both of these viewpoints augment the argument for ISO 9001 as being a marketing tool. Evans and Lindsay (2002 p.132) when describing ISO 9001, state that it began with the free movement of goods within the European market, which came into effect in 1987 (Rada 2013); this is when quality management became a critical strategic objective. However, they go on to explain that:

> *"Many diverse organizations have realised significant benefits from ISO 9000 that range from higher customer satisfaction and retention, better quality products and improved productivity".*

Dadoun (1992) emphasizes the fact that the EC countries have adopted ISO 9001 as a management tool to eliminate barriers. He goes on to explain that countries around the globe are implementing a certified QMS in an effort to promote trade. Similarly Boiral (2003), states that "ISO 9001 certification has become a commercial imperative," adding weight to the argument for the marketing perspective.

During a survey into the QM practises in the petroleum industry in Iran, Jones et al (2007) uncovered that, while they based their survey on the Malcolm Baldrige National Quality Award (Baldrige 2013), the main driver for quality management implementation was support from top management.

Jones et al (2007), state that in conjunction to the oil and gas sector there have been very few academic papers written on the implementation of quality management on a global scale. They state "Research into process-based industries is so rare," and quote the Journal of Operations Management 2003, as concurring with the same conclusions. Townsend et al (1992) explain that the major oil company Amoco amongst others, has moved to adopt the teachings of the founders of total quality management including Deming, Juran, Ishikawa, Feigenbaum, Miller and Taguchi. The reasoning behind this move is the costs involved in the total mining process of oil and gas; costs that are no longer feasible to absorb. Similarly, Arnold et al (1992) describes similar actions during

a drilling program in the Middle East, whereby twenty-five wells of a thirty-seven well program were completed with a fifteen percent reduction in costs. This reduction in costs is emphasized by Deming (1984 p.1), when he asks the question "Why is it that productivity increases as quality improves?" The answer being, "less rework, not so much waste."

Pinto (2000) reported that the Brazilian oil company proposed that the best way to enhance performance was to implement an integrated management system. Pinto's paper states that it covers sectors that include exploration and production, refining, transportation and distribution. The company had, at the time of writing this paper, seventy-nine ISO 9001 certifications in place among several other certifications, including environmental health and safety. This statistic illustrates the importance this operator places on ISO 9001 certification.

Al-Darrab et al (2012) discuss the advantages and disadvantages of implementing an IMS, and what the realized benefits would be to the operator. Their belief is that to maintain three separate systems is more complex than an IMS. Kemp (2006 p.284) states that one example of an integration of systems is during the execution of a project whereby quality, health and safety, risk and environmental issues are captured in same project documentation, an example of this would be a Project Quality Plan. This is because a project pulls together the work from all of the other processes under one umbrella. Mullins (1996 p.40) stated that "the principal of coordination is for people to act together with unity of action," whilst Dale et al (2007 p.311) state that within a system, the "concepts of each element should be compatible with each other and both the elements and the boundary should be defined." Lawrence and Lorsch (1967) explain that single departments in an organization operate differently; therefore, to integrate more than one system would be more complex than operating more than one system independently.

Casadesu (2003) explains that some requirements of ISO 9001 are difficult to comply with, such as customer satisfaction data analysis. He goes on to state that for a smaller organisation, gaining certification can be seen as an arduous task that is a resource-intensive exercise. The British Assessment Bureau (2011) carried out a survey which returned answers such as "it's a requirement in order to successfully submit tenders," and "a tick in the box for doing business." These are examples of limitations where smaller organizations did not gain certification to reap the perceived benefits, but only because it is a requirement for doing business. Another limitation or requirement exerted on the organisation is the need for all personnel involved to learn the procedures that apply to the certification process. This will inevitably lead to the compliance with national standards for the purposes of quality control as well as the added on regulatory standards associated with ISO 9001.

The "badge approach" and "marketing badge" are colloquial terms which loosely translate as the customer-driven requirement of having an ISO 9001 certified QMS and, being allowed to trade in the European and global markets. The implication is that a company has not sought certification because of the business benefits ISO 9001 has to offer (Hoyle (2009 p.93). This strategy is emphasized by Babakus (2004) when he explains that ISO 9001 was closely related to marketing activities.

Originally ISO 9001 was generated as a management tool to encourage the free movement of goods within the European Union, as discussed by Chittenden,

Poutziouris & Mukhtar (1998). But markets grew, and due to improved communications and travel, the world has become a smaller place to trade in (Killian and Murphy 2010). Therefore, more and more companies are finding that having an ISO 9001 certified QMS is a basic requirement for trading in a Global market (Lam et al 2008). This growth in the world-wide use of the standard has instigated criticism, purporting that the main reason for gaining certification was for the purpose of doing business, without consideration given to the business benefits.

Barnes (2000) explains that some organizations saw ISO 9000 as a pursuit of quality certificates as opposed to quality. Kemp (2006 p.92) argues against this when he states that the purpose of quality management is to, "hone business processes and to seek value both for the customer and for the organisation." A viewpoint shared by many, and described by Fakultesi & Bolumu (2012), is that implementing a QMS is a "strategic decision."

Abdel & Tigani (2011) add substance to the badge approach by explaining "organizations may succeed to obtain the required approvals for ISO 9000 certification, but, unfortunately, without the actual and effective implementation on the ground"; this approach highlights that companies may gain certification for trading purposes only.

Evans & Lindsay (2002 p.137) state that, "many organisations have realized significant benefits from ISO 9000," and go on to illustrate that;

> *"At DuPont, ISO 9000 has been credited with increasing on-time delivery from seventy to ninety percent whilst decreasing cycle time from fifteen days to one and a half days."*

This exemplifies that gaining an ISO 9001 certification is a more profitable way to do business, and at the same time, enables becoming an approved supplier of a prospective customer; this argues against the "tick in the box exercise" as explained by the British Assessment Bureau (2011). Marimon et al (2011) explained that,

> *"Being ISO 9000 compliant means having implemented a QMS that draws together standardised and documented procedures, the basic processes for the production of the goods or services that the client purchases."*

This paper also argues against the view that implementation of an ISO 9001 certified QMS is only for the purpose of doing business.

Evans and Lindsey (2002 p.134) explain that even after implementation of an ISO 9001 QMS, a company could rigorously adhere to it and comply to the standard, but still produce a poor quality product. This would be a prime example of implementation for reasons other than to improve customer satisfaction, increase efficiency etc.

Aslanertilk and Tabak (2005) explore the cost of implementing ISO 9001 in relation to the marketing of a company. They explain that included in the benefits of registration are improved product quality and less cost of quality; improved productivity, and profitability; and it enhanced marketing advantage. Their study illustrated that companies adopted the standard for marketing purposes, but also realises the benefits certification could obtain.

Findings

Do companies in the subsea sector use ISO 9001 for its intended purpose as explained by Dick (2003), in that the primary aim of an effective quality system is to provide a quality product or service? Or is it implemented merely to attract customers or, as Fakultesi & Bolumu (2012) argue, implementing a quality management system a strategic decision? The original need to implement ISO 9001 as a marketing tool, could also be accompanied inadvertently by its use as a quality tool, as discussed by Napier and Vaughan (2012a). Fatima (2014) augments the marketing perspective by explaining that companies in less developed countries are required to have ISO 9001 certification to trade on the global market, but also goes on to explain that firms with certified quality management systems were consistently producing quality products, which augments the perspective that the strategic reasoning behind certification was a stronger argument. The benefits from implementing an ISO 9001 QMS include reduced waste, lean communications and more direct actionable processes Shipley (2011). O'Donnell's survey (Appendix B), illustrates that of ninety-three respondents, nearly seventy percent thought the company's QMS did help to make the company more efficient. ISO 9001 delivers the benefits of consistency and effectiveness in companies (Buss 2011), it is not arduous to maintain (Elliot, Vaughan and Nash 2012a), and the ISO 9000 suite of standards provide a support mechanism enabling focus on continual improvement and the customer (Koehn and Datta 2003). Hoyle (2009 p. 85) concurs by explaining that the two main goals for implementation of a QMS are customer satisfaction and continual improvement. This is echoed by Wright and MSCM (2012 Participant Observation) when they state that, initially, the implementation of an ISO 9001 certified QMS was a customer requirement, but their companies were beginning to realize the benefits effective implementation had to offer.

The implementation of quality systems is increasing in oil companies within the oil and gas industries, and companies are realizing the benefits, which include reduced costs, as stated by Jenkins (2011). He explained that the benefits of certification for his company included a more structured approach to doing business, and that "departments were improving." He also stated that tangible results were being measured.

Flack (2012a) discussed improvement initiatives in his company, stating that they would be measured positively by the company winning more EPC contracts. Building quality into its products and services was also a part of the reasoning behind these initiatives. Without publishing the fact that his company operated a TQM philosophy, Flack indicated that the process and systems employed quietly and systematically implemented the teachings of Deming, Juran and Crosby.

Townsend et al (1992), Perez et al (1992), Arnold et al (1992) and Pinto (2000), all described how the operators within the oil and gas industries have moved to adopt quality management in a bid to reduce the waste in costs during drilling and exploration in various locations.

Oakland (2004 p.7) describes continual improvement as being a journey that once begun, must be continued. Ortiz (2009) agrees by explaining that a common misconception that companies make when embarking on a continual improvement program is that they think there is a definable finishing point. Oakland goes on

to explain that the benefits of embarking on such a program are: increased competitiveness, market share, reduced costs, improved productivity and the elimination of waste. Hoyle (2009 p.1) concurs with the point of reducing waste and goes on to explain that implementing a QMS in accordance with ISO 9001 will help an organisation to achieve its business goals. He reiterates that it will help make the business more profitable by reducing waste and streamlining business processes. Customer satisfaction and continual improvement are theories that are repeated in ISO 9001 continuously.

Alderman and Donegani (1994) explain in their publication that there is a requirement "beyond the obvious" for the oil companies to demonstrate an "efficiency in operations that impact decisions at their plant locations." They go on to discuss integrated management systems as their firm's choice of implementing a business strategy.

Gage and Farrugia (2012b) both stated that the implementation of an ISO 9001 QMS was not a marketing decision but a business decision to improve the company's products and services. They conceded that it was also a customer requirement and went on to explain that having such a system was also a requirement of their suppliers.

Strategic Decision or Marketing Tool

Rajan (2012b) stated that another of the reasons his company gained certification was for marketing purposes, including the suppliers to his company. This perspective is echoed by Aslanertilk and Tabak (2005) when they stated that the results of their study indicated that the reason behind certification was for marketing purposes. They went on to explain that improvements to the business were other possibilities. These included improved product quality and profitability. This discovery exemplifies the research objective; investigating whether or not the two concepts could be aligned.

Reid (2012) stated implementing ISO 9001 was part of a strategy to differentiate his company from their competitors; gaining ISO 9001 certification for marketing purposes only, was not a consideration. MacFarlane (2012) stated that although the implementation of an ISO 9001 QMS was primarily a strategic decision by his company, it was also a marketing decision. This again exemplifies the perspective that the two reasons behind certification could be aligned. From the primary research data gathered, it is evident that initially the marketing perspective is high on the agenda for gaining certification, but the evidence gathered also indicated that certification was a strategic business decision.

Rajan (2012b) stated that the reasons that the suppliers to his company gained certification were two-fold, (i) to get onto the Approved Vendors List and (ii), because it was a requirement of his company that suppliers held this certificate. Lam et al (2008) stated that the use of ISO 9001 was on a global scale now and was an intrinsic requirement for trading on the global market. This perspective is echoed by Tang et al (2008) when they stated that having an ISO 9001 QMS was a basic requirement for gaining entry to a prospective customer's AVL. This would lead the reader to believe it is a strategic tool in as much as they see ISO 9001 as a means for doing business, and also as a marketing tool for

trading on the global market. Hoyle (2009, p.93) explains that "many organisations have been driven to seek ISO 9001 certification by pressure from customers rather than as an incentive to improve business performance."

Scougall (2012) stated that the implementation of an ISO 9001 QMS was a strategic business decision. He went on to state that it was also a marketing decision and it also benefited the company because it was a requirement for gaining entry to the AVL of prospective customers. McIntyre (2012) agreed with this when he stated that the implementation of ISO 9001 QMS was a strategic decision, and that his company was expected to have the certification by their customers; like other interviewees they stated it was expected that the suppliers have it, as discussed by Dinnes (2012). The requirement of suppliers' QMS to be ISO 9001 certified is a recurring response to the question. It emphasizes the argument for gaining certification for the purpose of doing business, as discussed by Seddon (2012).

The decision of implementing an ISO 9001 QMS as a strategic business decision could exist as a strategy in its own right. However, O'Donnell's Survey (Appendix B) illustrated that of the ninety three respondents; fewer than thirty-four percent thought ISO 9001 was merely a badge for doing business.

Alignment

Many of the sources stated that the implementation of an ISO 9001 QMS was a business decision to allow trading on the global market, and gaining entry to prospective customers' AVL. However, a large percentage also stated that through effective implementation, their companies were realizing the benefits such as improved product quality, increased efficiency and improved customer satisfaction.

Dinnes (2012) stated that the implementation of an ISO 9001 certified QMS was a customer requirement, and that it was a basic requirement for all of his company's suppliers' QMS to have ISO 9001 certification. It was also a strategic decision that was benefiting the company. Similarly, Elliot (2012 Participant Observation), explained that initially implementation of such a QMS was a customer requirement, but now the company was realizing the benefits the standard had to offer such as improved product quality and increased customer satisfaction. These answers would indicate that the motives behind implementation of an ISO 9001 QMS can be aligned, albeit sometimes inadvertently.

Evans and Lindsay (2002 p.132) concur when they explain that the free movement of goods within the EU instigated the ISO 9000 suite of standards that are now utilised on a world-wide scale in the present day. But they also go on to explain that firms were realizing the benefits of ISO 9000, benefits such as "higher customer satisfaction and retention, better quality products and improved productivity." Abdel & Tigani (2011), being proponents for the badge approach, explain that often companies gain ISO 9001 certification "without having the actual and effective implementation on the ground." The Pakistan government on 2002 funded a scheme to encourage businesses to gain the ISO 9001 certificate based on a study on the financial gains between companies with and without

certification (Fatima 2014). The evidence gathered is indicating that alignment of the motives is a distinct possibility.

During this project, the author was additionally engaged as a quality consultant by a company from a different industry. The purpose of this engagement was to establish their QMS procedures and guide them through ISO 9001 certification. This was solely for the purposes of elevating their standing in the market place and enhancing their competitive advantage. Similarly, Dale et al (2007 p. 288), explain that customers now look for their suppliers to have an ISO 9001 certified QMS. This was a viewpoint clearly stated from the outset of the certification process. Thompson (2005) describes this as "Business strategies, like military strategy, are a matter of manoeuvres for a superior position." The point being made is that the implementation of such a system as a strategic tool appears to be pervasive throughout various industries. With the above company, it could be argued that the reason to gain certification for its QMS was strategic, but fundamentally certification was used as a marketing tool. The conclusion is that the reasons behind gaining certification are the same. Through time, the company may come to realize the benefits ISO 9001 has to offer. This will largely depend on how rigorously it implements the standard and how much it invests in its QMS.

The Use of ISO 9001 in the Industry

All evidence gathered so far indicates that, for whichever reason, all suppliers that serve this industry have an ISO 9001 certified QMS, as stated by Rajan (2011). Companies unlikely to have it are oil and gas operators, as explained by Nash (2012, Participant Observation). He explained that Chevron did not need to implement ISO 9001 as a marketing tool because ultimately, they are the customers; this combined with the fact that operates in many countries around the world certainly negates the marketing requirement. Sampaio, Saraiva and Rodrigues echo this sentiment by explaining that ISO 9001 certification was now a world-wide phenomenon. Implementation in companies such as this would be for strategic reasons as discussed by Townsend et al (1992), Hendrick and Singhal (2001) and Kim and Chang (1995)

Townsend et al (1992) goes on to explain that another large oil company, Amoco, is now turning towards the teachings of the renowned experts in the field of quality management, including Deming, Juran et al. Similarly, Perez et al (1992), Arnold et al (1992), and Pinto (2000), all describe how large oil companies are implementing quality systems such as ISO 9001 in a bid to reduce costs, improve productivity and also to improve product quality.

Although all of the interviewees returned answers to the effect that all suppliers must have an ISO 9001 QMS in place, O'Donnell's survey (Appendix B), discovered that of the ninety-three respondents, over fifty percent conceded that their company had employed the services of a supplier that is not on the AVL. These statistics illustrate that there are companies with the certification who are not fully complying. Whether or not this has been documented is a question for another research paper.

Integrated Management Systems, (IMS)

Integrated management systems in some companies were discovered in the secondary phase of the research during this project. No primary sources alluded to the fact that their companies operated an IMS. As BSI (2012a) describes them:

> *"An integrated management system is a management system that integrates all of an organization's systems and processes into one complete framework, enabling an organization to work as a single unit with unified objectives."*

BSI (2012b) describes "PAS 99" as a solution for an organisation wishing to integrate two or more management systems. Al-Darrab et al (2012) discuss IMS in their journal concluding that to maintain three separate systems would be more complex than a single system. Griffith (2007) supports the theory of the IMS, but at the same time he bemoans ISO 9001, calling it a bureaucratic, paper-driven system that is arduous to maintain, with the benefits being questionable to organizations who implement them. This subject of IMS opens itself to another research paper.

Consider how the findings relate to earlier work

Alignment of the motives for implementing ISO 9001 was not discovered in any of the secondary research sources. That was a product of the primary research phase. McIntyre, Elliot and Reid (2012) all returned positive responses when questioned on the alignment of motives for certification. One of the conclusions of this project is that alignment of the motives is an inadvertent by-product of certification. It will however largely depend on how rigorously an individual company implements the standard. Implementing a QMS in accordance with ISO 9001, Hoyle (2009 p.1) states will help an organisation to achieve its goals. However, Abdel & Tigani (2011) add substance to the badge approach by explaining that, "organizations may succeed to obtain the required approvals for the ISO 9000 certificate without actual and effective implementation on the ground." This is indicative of the difference in findings between the secondary and primary sources.

Suggested improvements to research design, additional questions, recommendations, further research

The secondary research sources that discuss the oil and gas industries, in particular, all discuss regions, countries or companies. Authors such as Garvin (1991), Townsend et al (1992), Perez et al (1992), Arnold et al (1992) and Pinto (2000) all discussed countries and companies in particular. This highlights the fact that the scope of this research project was limited due to time and financial constraints. Therefore a recommendation for a future research project would be to identify a more focused area. The findings of a larger research project would

cover more people and companies. The potential primary research subjects would increase and the findings would have a larger picture; although it is believed that the findings and conclusions would be similar to those in this project. That being said, many of the authors discussing quality management did not define companies or countries. They instead focused on the concept, making it applicable to everyone who was to implement an ISO 9001 QMS. Hoyle (2009), Kemp (2006) and Oakland (2004) never discuss individual companies or countries, nor do they discuss any specific industries. It could be argued from this observation that the project is two-fold in nature: the first being quality management systems, the second being the subsea sector of the oil and gas industry that it is being applied in.

The primary research data was the most informative for drawing conclusions on the subsea sector of the oil and gas industries. A further recommendation would be to ensure the number of interviewees was increased.

For a project of this magnitude, participant observation as discussed by Saunders et al (2009 p.288) was a good research method. The author was included in supplier audits that allowed him to widen the number of primary sources. However, in a research project of a greater magnitude, participant observation may be a lesser valid method. Saunders et al (2009 p.295) discusses this method being applied when a greater understanding of phenomena is required. However, if a greater number of primary sources were to be identified for a future project, the interview / questionnaire would be a more suitable research method. The researcher could not immerse him / herself into situations to observe how QMS are operated in every primary source identified; this would be a time consuming exercise that would require extra funding.

The recommendations are that further research is carried out in companies that operate within this industry. The issue of integrated management systems is another area that requires a detailed research project. It became apparent that there are conflicting views on IMS. They may suit one company, but not another. A detailed research paper could discover a way that IMS could be amended to suit more companies; although at this time, that is only speculation.

Conclusions

The Use of the Standard

All of the primary sources consulted worked for companies that had ISO 9001 certification for their QMS. As discussed by Rajan (2012b) all of his company's suppliers had certification because it was a requirement to gain entry on the AVL. This requirement was emphasized by Jenkins (2012) who stated that all of his company's competitors had ISO 9001 certification. Similarly, Lam et al (2008) stated that having an ISO 9001 certified QMS is a basic requirement for trading in a global market within the oil and gas industries. The author arrived at the conclusion derived from the evidence gathered, that all companies trading in this industry have an ISO 9001 certified QMS. There was no evidence discovered from any sources, and indeed, in the experience of the author, that there were any companies operating in these industries without an ISO 9001 QMS.

Observation on the Lack of Published Material

It was noted by the author that the range of academic journals and text books published regarding the use of ISO 9001 in the oil and gas industries was not abundant, and on the industry specific subsea sector, there were very few to be found. This view is shared by Jones et al (2007); the finding noted by them was that there have been very few academic papers written on the implementation of quality management on a global scale in the oil and gas industries. As a result, any conclusions of this research project are drawn with the understanding of the limited scope of available research. It is acknowledged that there needs to be further research into companies that operate within the oil and gas industries, and more specifically within the subsea sector, in order to correlate the findings from this research project. Identified criteria for investigation would enhance the validity of the results. Also, if the data were to be representative of the industry as a whole, the research would need to be addressed on a world-wide scale.

The Benefits of Certification

The motives for gaining certification varied within the primary and secondary research data gathered. The experts in quality management such Hoyle, Kemp and Oakland also discuss implementation with little reference to ulterior motives, such as "the marketing badge," (Babakus 2004) and "a reason for trading on the Global market" (Dadoun 1992). Hoyle (2009 p. 85) explains that the two main goals for implementation of a QMS are customer satisfaction and continual improvement. Kemp (2006 p.92) stated that the purpose of a quality management system is to, "hone business processes and to seek value both for the customer and for the organisation." Scott (2012b), Shipley (2011), Koehn and Datta (2003), Kemp (2006 p.92) and Rajan (2012b) all agreed when they stated that gaining an ISO certified QMS was a strategic decision that benefited their company. Similarly Reid (2012), MacFarlane (2012), Farrugia (2012b), Townsend et al (1992), Perez et al (1992), Arnold et al (1992) and Pinto (2000) also stated that the implementation of ISO 9001 was a strategic tool that benefited their companies. Jenkins (2012), Shipley (2012) and Buss (2012) all concur with this perspective when they describe the improvements within their company which can be attributed to the implementation of ISO 9001.

The Limitations of Certification

There were few limitations uncovered during the research gathering phases of this project. Casadesu (2003) stated that gaining and understanding customer satisfaction data was, in his opinion, a difficult task. He went on to explain that in smaller organizations gaining certification was an arduous task that was resource intensive. Another limitation, yet a requirement exerted on the organization, is the need for all personnel involved to learn the procedures that apply to the certification process. O'Donnell's survey (Appendix B) illustrated that out of ninety-three respondents; only six percent felt strongly that the

maintenance of the company's QMS was an arduous task. Similarly, the majority of the interviewees, including Dinnes (2012), Scougall (2012) and Macfarlane (2012), agreed that maintaining their company's QMS was not an arduous task.

In conclusion, the evidence is over-whelming that, if rigorously implemented, an ISO 9001 QMS will deliver tangible business improvements such as increased effectiveness and efficiency (Evans and Lindsay 2002 p.132; Jenkins 2011), it will reduce costs (Hoyle 2009 p.1), and it will therefore help the organization to become more profitable. Therefore, dependent on the size of the organization, the implementation of ISO 9001 could have more significant commercial implications.

The Marketing Badge

The alternative motive for gaining certification is for marketing purposes; this includes, gaining entry to a prospective customer's AVL and enabling trading on the European and global markets. Dadoun (1992), Aslanertilk and Tabak (2005), Seddon (2002) and Boiral (2003), amongst others, agree with this viewpoint. Most of the primary sources stated that certification was a requirement to gain entry on to prospective customers' AVL, and similarly, it was a requirement that suppliers to their company were required to have an ISO 9001 QMS, (Scott 2012), (Nash 2012) (Vaughan (2012), (Rajan 2012b), (Hoyle 2009, p.93), Dinnes (2012).

The conclusion that can be drawn from this research is that all companies in the supply chain that serve the subsea sector of the oil and gas industries have an ISO 9001 primarily because it is a customer requirement, and, it enables companies to trade on the European and Global markets.

Alignment of the Motives

The alignment of these two motives - strategic business tool and a marketing badge, was a recurring result from the primary research data, but could not be found in the secondary research data. It's important to note this alignment; otherwise the reader could be left to conclude that the marketing perspective was the only reason companies gained ISO 9001 certification for their QMS, when in fact this is not the case. An MSCM employee stated that gaining ISO 9001 certification was initially driven by it being a customer requirement, but additionally, the company was now realizing the benefits. This exemplifies the results gathered during the primary data gathering phase. Most of the interviewees stated that the implementation of ISO 9001 was to gain entry to a prospective AVL, but also, that it was a strategic business move by their company (Scougall, Dinnes & Napier 2012 amongst others).

The conclusion from this evidence is that the alignment of these motives is inevitable, if the system is rigorously implemented. No evidence was uncovered during the secondary phase of data gathering to suggest companies might adopt ISO 9001 as a strategic business tool and a marketing tool at the same time. Either the authors were describing the benefits of certification, or they were minimizing it as merely a tool to be used for marketing purposes only. The latter half went on to describe the certification as a means to trading on the European and global Markets, but the alignment of motives represented the companies who

implemented ISO 9001 in an effort to reap the benefits certification had to offer in terms of reduced waste, increased efficiency and effectiveness.

Recommendations

Following on from the conclusions of this project, further research is required. In order to gain true representation of how ISO 9001 QMS are operated in the subsea sector of the oil and gas industries, a world-wide research project would be recommended; but, owing to the access required and the logistical and financial arranging this would entail, a project on a smaller scale is the recommendation.

In order to corroborate the results, the author sees the need for a research project with the same objectives, executed within a smaller, more focused research field; therefore the first recommendation is that only one project is targeted. Hatch (2013) reports on the Gorgon gas field, which lies one hundred and thirty kilometres off the coast of Australia; this could be the target research field. The data would be gathered from the owners of the gas field: Australian subsidiaries of Chevron, ExxonMobil, Osaka Gas, Tokyo Gas and Chubu Electric Power; all the way through the organizations to their supply chains and junior supply chains. Presuming the necessary permissions were in place, a detailed research project could be executed in order to return results that would be representative of how ISO 9001 certified QMS are operated and maintained in organisations that serve the subsea sector of the oil and gas industries.

The second recommendation is to instigate a research project into integrated management systems. During the secondary phase of this project, these systems were uncovered on numerous occasions. This would give credence to the fact that an IMSs might be suitable for one company, whilst being unsuitable for another.

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Appendix A – Primary Sources

N. Jenkins – Project Quality Team Leader, GE Oil & Gas
D. Shipley – Site QA Leader, GE Oil & Gas
B. Scott – Senior Quality Engineer, BP
R. Macfarlane – Senior Quality Engineer, Total
I. McIntyre – Quality Engineer, Subsea 7
L. Reid – Quality Leader, Halliburton
M. Dinnes – Quality Manager, FMT
S. Owen – Head of Quality, GKN Aerospace
M. Patel - Quality Engineer, GKN Aerospace
W. Elliot - Quality Engineer, Subsea 7
G. Kessack - Senior Quality Engineer, Aker Solutions
R. Dubey – Project Quality Engineer, GE Oil & Gas
A. Farrugia – Project Quality Engineer, Panasonic, GE Oil & Gas
R. Gage - Project Quality Engineer, Panasonic, GE Oil & Gas
N. Vaughan - Project Quality Engineer, GE Oil & Gas
D. Nash – Quality Engineer, Chevron, BP
P. Flack - Project Quality Engineer, GE Oil & Gas
R. Napier – Senior Quality Engineer, Total
S. Rajan – QHSE Manager, CB & I
C. Denovan – Project Quality Manager, CB & I
J. Buss – QMS Leader, GE Oil & Gas
M. Scougall – Senior Quality Engineer, Global Engineering
4 x Project Engineers – CB & I – anonymous
Participant Observation – GE Oil & Gas

Appendix B – Survey Questionnaire

LEGEND	
SD	Strongly Disagree
D	Disagree
U	Undecided
A	Agree
SA	Strongly Agree

QUALITY MANAGEMENT SYSTEMS						
No	Statement	Responses				
		SA	A	U	D	SD
1	The Quality Management System (QMS) in place helps the company to be efficient & effective.	24	42	10	9	8
2	Your organisation's QMS is over-laden with procedures.	14	31	12	35	1
3	Quality Engineers are solely responsible for Quality.	3	8	4	32	46
4	Continuous Improvement in your organisation's QMS is apparent and well documented.	9	39	12	27	6
5	You are aware of how to raise or document an "opportunity for improvement" within your organisation.	13	50	7	19	4
6	Your organisation's QMS is communicated clearly from a corporate level to a project level	9	41	15	22	6
7	Your organisation's QMS is designed to consider your customer's requirements and meet their expectations.	20	48	16	8	1
8	Your organisation goes "above and beyond the call of duty" to enhance customer satisfaction.	9	37	23	20	4
9	Your organisation has good processes in place to document customer feedback.	12	38	20	20	3
10	Customer complaints are dealt with in such a way that the organisation will avoid the same complaint from a different customer.	12	27	17	32	5
11	The supplier selection process is clear and well defined in your organisation's QMS.	11	45	19	15	3

12	There are occasions when a supplier is used that it is not on the Approved Vendors List.	7	41	11	27	7
13	Having a single source supplier for certain products / equipment is a good strategy.	4	23	8	44	14
14	ISO 9001 certificate is merely a badge for doing business.	11	21	15	28	18
15	In comparison to other industries, the requirements of the Oil & Gas industries make the application of a successful QMS a difficult task.	6	21	16	42	8
16	The legislative and regulatory requirements of the Oil & Gas industries are onerous.	3	33	27	23	7
17	Your organisation provides training opportunities for all personnel wishing to progress their career.	19	45	16	10	3
18	The company maintains a qualification / competency matrix for all project personnel.	12	33	21	18	9
19	You are aware of your organisation's Quality Objectives.	26	53	8	3	3
20	Your organisation has adequate measures / resources in place to ensure quality requirements are achieved throughout the manufacturing process of a product.	19	35	18	19	2