

Maximizing the Benefits of ISO 21500 Implementation

Lára Kristín Kristinsdóttir

Department of Business Administration and Environmental and Natural Resources
University of Iceland

Eðvald Möller

Department of Business Administration
University of Iceland

Abstract

The objective of this article is to examine what needs to be considered if implementation of ISO 21500 is sought. There are four points that this article focuses on for organizations to consider before implementing ISO 21500. These are: the reasons behind implementation, what might stand in the way of completing the implementation process, realizing the benefits it might bring and what might be the optimum implementation strategy. The results show that to maximize the benefits of incorporating ISO 21500 it is necessary to have the top management committed to achieving the standard, decisions must be made on important subjects like documentation and communication, and proper training must be given to employees so they are capable of incorporating the standard into their daily work.

Keywords: Project management, structure, certification, quality, ISO 21500, processes, implementation

1. Introduction

Project management is becoming increasingly popular among organizations today since more organizations have become project orientated with every year. As a result, “One-fifth of the world’s GDP, or more than \$12 trillion, will be spent on projects each year in the decade 2010–2020” (Stellingwerf & Zandhuis, 2013). People working with complex processes and with concepts that are often hard to understand are involved in these projects. With the increased demand and pressure, the International Standard Organization (ISO) decided to publish a project management standard, ISO 21500, to make those processes and concepts more comprehensible and more widely available for companies to cooperate more efficiently.

It is important that when talking about project management, it is understood what projects consist of today, as most project management literature (P. Morris & Hough, 1988; P. W. G. Morris, 2013; Packendorff, 1995; PMI Standards Committee, 1987) defines a project usually as: a unique once-in-a-lifetime task, with a set date of delivery, subjected to one or several performance goals and consisting of a number of complex and/or interdependent activities. Project management, therefore, is about controlling all of these aspects, but project management covers a lot of ground because of numerous theories connected with the subject. The need to master various combinations of disciplines, such as leadership, time management, communication, documentation and managing stakeholders, is a key part of managing projects.

In 2012, the International Standard Organization published a standard for project management, called ISO 21500, with the purpose of providing guidance for organizations on concepts and processes of project management that can positively affect the performance of projects. The ISO was established in London in 1946 and is a non-governmental, independent organization made up of members from the national standards bodies of 164 countries (“Structure and governance”, n.d.). One of the reasons why the ISO 21500 standard was developed is because companies are constantly looking for answers to why some projects are successful while others are not. Projects within organizations have gained increasingly more attention over the past decade and Boltanski and Chiapello (1999) suggested that the “projective city” is an integral part of modern capitalist ideology. The aim of ISO 21500 is to create a standard that is both international and can also be applied to more customized projects. The intention is to develop a best practice for organizations to handle their projects so they can establish a better structure around their projects, and to make organizations more in control of their processes. Currently, the ISO has over 19,500 international standards covering almost all aspects of technology and business (Harjung, Lukorito, & Seitz, 2012).

Even though there are several other organizations, such as the International Project Management Association, the Global Project Management Forum, Global Working Groups and the Operational Level Coordination Initiative, there is still the need for one universal standard in project management. The number of organizations involved in making project management guidelines only shows how increasingly important project management has become and the need for an effective standard set by the world leading standardization organization, the ISO.

2. The Reasons for Seeking ISO Implementation

There are several reasons why organizations seek out ISO implementation, depending on the sector as well as the motivations and expectations of the organization. What is known is that, in 2008, over a million companies worldwide implemented ISO 9001 (“ISO 9000”, n.d.), while implementation of ISO 14001 has increased considerably, and, by the end of 2011, 267,457 certificates that had been issued in 158 countries (“ISO publish latest survey on ISO 9001,” 2012). In the period from 2000 to 2012, the number of ISO 14001 certificates issued worldwide increased nearly 11-fold, taken into account the differences among countries and sectors (Marimon, Llach, & Bernardo, 2011). The number of certificates sought shows that the demand for a high-quality system is quite high and there are several reasons for this. There are three types of motives that lead companies to implement ISO 14001, according to (Bansal & Roth, 2000): ethical, competitive and relational. Ethical motives are connected to feelings related to environmental responsibility, competitive motives arise from the search for an advantage on the market, and relational motives stem from the desire to become legitimized and improve relationships between different interest groups in the company. This has been debated, but motives are either categorized as external, such as customer demands, pressure from interest groups or governmental restrictions, or internal, such as the concerns of top management, improvement of performance and minimization of risk. Special attention has been drawn to the influence of customer pressure and demands from other interest groups (Corbett & Kirsch, 2001) and matters concerning the external image of the company (Schylander & Martinuzzi, 2007). Among the sources of external pressure, all studies highlight the influence of coercive pressure from customers in those sectors in which the degree of customer bargaining is high. The motives leading to ISO 14001 are therefore diverse, due to internal and external motives and depending on the company and situation.

The same findings can be seen for studies regarding motivation and benefits received from ISO 9000. A research conducted on enterprises in Western Australia showed that there were four motivating factors for implementing the standard (Zaramdini, 2007). These were: operational improvement, following competitors, human resources improvement, and supplier relationship. What the findings concluded was the same as other literature on the subject suggests, that certified firms have to adopt the right approach when seeking ISO certification and seek it for internal rather than external reasons. It has also been suggested by previous research studies that firms that pursue ISO 9000 for internal reasons obtain greater benefits than those who pursue it only for external reasons (Heras-Saizarbitoria, Landín, & Molina-Azorín, 2011a). What has also been noted is that the more motivated companies are, the greater the benefits that are gained (Heras-Saizarbitoria, Molina-Azorín, & Dick, 2011b). Companies that are motivated by more internal reasons have been linked to better results than those that are motivated by external reasons.

3. The Implications of ISO Implementation

When an ISO standard is implemented it is a big decision amongst owners since it may be a decision to change certain processes, incorporating new ways of working and/or changing the entire structure of the organization. One of the obstacles for many organizations is the price of implementing a high-quality system such as ISO 9000 or ISO 14001. In a study conducted by Taylor (1995), only 18% of certified organizations examined in the study measured the financial impact of implementing ISO 9000. It found that 54% said it had saved them money, while only 15% believed it had only cost them money. It can be concluded that most organizations feel that the benefits of ISO 9000 certification outweigh the costs, even though the cost of getting certification can be quite high (Douglas, Kirk, Brennan, & Ingram, 1999). Another implication of ISO is the certification audit and its reliability. A study has found that audits have a procedural rather than substantive focus, which raises serious questions about the significance and reliability of the ISO certification process (Heras-Saizarbitoria, Molina-Azorín, et al., 2011b). Their conclusion was that the adoption of ISO 14001 was more symbolic than substantial. Before deciding to implement an ISO standard one has to be aware that ISO 9000 does not deal with factors external to the company. The standard lacks influence regarding financial management in projects in relation to inflation rates and prices as well as international and national economic climates, price regulation and government stability.

ISO 9000 is solely focused on internal management and is not designed to address such uncertain factors related to the external environment (Din, Abd-Hamid, & Bryde, 2011). What one also has to bear in mind is that even though there are various benefits to implementing ISO standards, the right motives need to be in place for implementation, since another study obtained parallel findings for both ISO 14001 and ISO 9001 adoption, indicating that it might be wise to only pursue accreditation if it were considered to benefit the company in more ways than just in terms of profitability, since the study found that no improvements in sales or profitability after certification were found (Heras-Saizarbitoria, Molina-Azorín, et al., 2011a). When incorporating something as influential as an ISO standard there are going to be several implications and shortcomings that have been widely documented, but there has been little attempt to measure the benefits of having a high-quality management system in place.

4. The Benefits of ISO

There are multiple benefits that ISO can bring to any organization, but the most important is the quality of the system that it helps organizations put in place. ISO standards give a consistent set of procedures and requirements that can be universally applied, but it is up to the organizations to decide how they are going to be executed. The standard does not ensure high-quality goods or services, but having the quality system in place ensures that organizations have the ability to provide the high-quality goods and services that they want to deliver (Douglas et al., 1999). According to a study conducted by Din, Abd-Hamid and Bryde (2011), there is a positive relationship between ISO 9000 certification and elements of organizational performance. The findings also provide evidence that having ISO 9000 enhances project success in the following areas: adherence to budget, schedule and quality specifications; efficiency of management effort; fitness for purpose; usability; and delivering user and client benefits. According to ISO 14001, a corporate environmental strategy is a tool that may help organizations gain a competitive advantage and improve performance levels (Hart, 1995; Porter & Van der Linde, 1995; Trung & Kumar, 2005). By incorporating ISO 14001, firms may reduce costs and increase revenue through environmental management. A research was conducted to examine the relationship between ISO 14001 and financial performance, and it was concluded that firms with better-than-average performance have a greater tendency to pursue certification. The study further explains that preventing pollution through implementation of ISO 14001 may enable firms to save control cost, input and energy consumption and to reuse material through recycling. Therefore, environmental management can provide opportunities to reduce costs and increase revenue. Another study found that benefits related to ISO 14001 include the improvement of the company's reputation, improvement of information systems and more motivated employees in regards to the firms goals (Heras-Saizarbitoria, Landín, et al., 2011a) What the study also found was that the involvement of employees depends greatly on the attitude of the management towards the environment.

5. The Optimum Implementation Scenario

A study carried out by Douglas, Kirk, Brennan and Ingram (1999) discovered the optimum implementation scenario to maximize the benefits that ISO 9000 can bring. First, the management must show their intent to implement ISO 9000 and show, through their actions, that they are committed to achieving it. Secondly, they must decide to do it for the "right" reason, i.e. for internal motives such as improving quality rather than being pressurized by customers or other organizations. Thirdly, outside consultants are considered to be supportive in helping with the transmission, but effort should be put into ensuring that the right consultant is found to perform the task. Lastly, organizations are warned not to overestimate the likely benefits of ISO 9000. What other studies have found is that if ISO 9000 practices are not adopted into daily practice while the implementation is taking place, then it is highly unlikely that ISO will have any lasting performance impact. Therefore, managers and employees within an organization really have to modify their behaviour and decision making for ISO 9000 to be as effective as it can be (Ismail & Hashmi, 1999). Another study echoed the point made above, that if ISO 9000 is implemented for the wrong reasons, i.e. if decision makers are forced in some way to internalize the standard, then they should not adopt it in the first place (Huang, Horng, & Chen, 1999). Another factor that needs to be addressed is that implementation takes time. If it is rushed it is more likely to deliver less than the desired results, especially in the critical early stages of implementation. Managers should therefore be careful when assessing the threats to internalization before proceeding with an ISO certification (Briscoe, Fawcett, & Todd, 2005).

There are similar success factors for implementing ISO 14001 as well, although the complexity of implementation can depend on many factors, such as management and employee commitment, location, and the type and complexity of the operation (Wilson, 1997). The success of implementation depends greatly on commitment and co-operation from all levels and functions within the organization, according to a study conducted by Chin, Chiu and Tummala (1999). The establishment of ISO 14001 is a long-term programme involving the participation of employees from all levels and functions within an organization. Therefore it is crucial to have total commitment and support from the top management where every word and phrase should be carefully thought through and its implications fully understood (Chin et al., 1999). What is also required for optimum implementation is an open mind for important changes in the organization. There are several processes that change, for example training, awareness, communication, documentation, control and emergency preparedness. These changes could alter the entire structure of the company. According to another study conducted on ISO 14001 in China, the top five factors out of 27 were: environmental consciousness of top leaders; consciousness of middle management; well-defined responsibility regarding environmental management; legal system; and legal enforcement (Zeng, Tam, Tam, & Deng, 2005). These topics were considered to be necessary for the best chance of successful implementation. It was also considered relevant that the government should play an important role in promoting environmental management. Companies need active support in order to incorporate the standard, by establishing a proper legal structure to promote ISO 14001. Another way would be to provide soft loans or short-term subsidies to the construction industry, and what is quite crucial is the training of the leaders of construction firms to arouse their environmental awareness (Zeng et al., 2005). It can therefore be concluded that there are rather similar success factors that can make the implementation process of both ISO 14001 and ISO 9001 more successful.

6. Methodology

To understand how organizations can maximize the benefits of implementation, a study was carried out on one Consultancy Company in Iceland, which wanted to implement the standard. A qualitative research was conducted to understand the reasons for seeking implementation, what might stand in the way of incorporating it and what potential benefits might come from it. The interviews were semi-structured (Newton, 2010), so a list of questions was made to cover specific topics but the interviewee had a great deal of leeway in how to reply. The purpose of using a semi-structured interview was to make the interview more flexible and to put more emphasis on the thoughts of the interviewee rather than further explaining what was considered irrelevant. The focus group for the research was the employees of the consultancy company. There were six employees interviewed out of fourteen and the sampling was in accordance with convenience sampling or based on who was located at the headquarters at the time and who had the time to participate in the interviews. To gain a better insight into ISO 21500, an interview was conducted with Miles Shepherd, the chairman of the ISO project committee, and Jouko Vaskimo, who is the Finnish delegate for the ISO 21500 standard. This gave an incredible insight into how the standard was made, how the process evolved, and what the future of the standard will likely be.

7. Discussion

According to the participants of the study, there were certain reasons for seeking ISO implementation and particular expectations it would solve. They wanted the company to improve in regard to projects, processes and communication. One participant wanted to incorporate a database to handle documentation, sharing and distribution of information. Another participant also wanted documented meetings where projects would be discussed, where it would be clearer when a project stops, why it stops and what can be done about it. Other participants wanted to improve the current processes and have a system that has a better overview of their projects, some kind of an umbrella that keeps all projects together and puts them into one system. Some wanted to update SharePoint, a piece of Microsoft software that is being used rather sparingly, while others wanted a different kind of software depending on each participant. What was also expected of the standards was more disciplined work, good structure and more significant information. Further, one participant wanted more emphasis on team-building, where everyone works better together, since there are thought to be two divided groups at work, those who manage and those who are employees. The communication needed to be better between departments, where people talk more about projects and processes, and it was also considered good to have project management meetings for all the staff regularly. Participants also wanted some kind of database or guidebook to look up processes if in doubt, so everyone would be working by the same method, thereby eliminating unexpected incidents.

The implications in terms of implementing ISO 21500 are several fold. With regard to the consultancy company, there were certain reasons why they believed implementing the standard could be problematic. From past failures to current attitudes, participants felt that it was a challenge to change the company, either because they felt they themselves could not change or they felt others would not be receptive to it. The average age was considered to be an obstacle since it was thought to be around 50, and not all employees were open to new ways of working because of their outlook. The participants all mentioned that there is little time and extra work is definitely not welcome, and most participants felt they do not have the time because everyone is working so much that it is hard to incorporate something new. One participant stated that men are scared of bureaucracy and extra workload, and as a result there is never the time for the employers to set up a project management system, even though it might save time and money. This could be solved, but other participants pointed out that even if a system was in place, not everyone would follow it. Employees are considered to be so different, independent and so fixed in how they work that one participant stated that *“this standard is attacking a certain kingdom where each and every one is a king”*. As a result, there are certain issues that need to be addressed before implementing the standard and kept in mind while the process is being undertaken. Even though audits have been criticized, they have a certain function in that an audit process checks that all companies follow the fundamental processes of ISO, but with ISO 21500 the moment that organizations purchase the standard and start working to implement it they can state that they have ISO 21500 (Shepherd, 2013)(Vaskimo, 2013). This can be seen as reducing the accountability of the standard since any organization can buy the standard, claim they are implementing it but in reality not be.

The potential benefits that ISO 21500 can bring to organizations are several, and the study found that there were numerous potential benefits for the company if the standard were to be implemented. First of all, it would bring a common process to all projects whereby employees and managers would synchronize their work and minimize shortcomings. Another benefit would be that communication and documentation would be managed with more care and with the necessary resources available. The standard would, as a result, pave the way for stronger and more stable documentation and communication processes. The third benefit the standard could bring would be possible solidarity between workers and employees, since if used wisely it can create clearer boundaries of what is expected of everyone and stronger ties in terms of working as a team. The last benefit that will be mentioned, even though there are a great many more, is quality. Quality is something that every company needs to address since it is what the company stands for. The standard will give the company the opportunity to evaluate what kinds of work procedures they want to incorporate and how they will incorporate that quality into the minds of the employees and managers.

To maximize the implementation process for ISO 21500, the academic research on other ISO standards should be considered since it gives a greater picture of what is effective in different industries and different countries and would therefore apply for companies seeking ISO 21500. According to the study, it would be wise for the company to agree to one documentation system and improve communication before starting the process of implementing the standard. It would also be beneficial to focus on what the organizational strategy for the company is, so that the company knows where they would like to be in 5–15 years. As a result, they would clarify the quality they would like to stand for and the future of the company, and therefore choose the right opportunities and projects that they would like to undertake. In order to clarify their future goals, the company would therefore need to consider the reasons why they would like to implement the standard and realize that if and if the reasons were mostly internal instead of only external they would have a better chance of successful implementation. The company would also need to motivate and inform the employees of the reasons for the implementation and give them proper training and guidance to use the processes in their daily work. The implementation success would be in the hands of the top management, since it will only be successful if the employees agree to the changes and become active participants in the process.

8. Conclusion

The interest in implementing ISO 21500 came from two employees at the company, and when further researching what might motivate other participants in the company to incorporate the standard they mentioned improvement in regard to projects, processes and communications. These are all internal motives to incorporate the standard, but the issue at hand is that the top management is not entirely on board with whether to incorporate the standard or not. The concern of employees and managers was the implications the company might endure if they decided to incorporate the standard, since many believed that it was hard to change their current situation.

To address the issue, most organizations use training and inform employees of the benefits of incorporating the standard. The potential benefits the standard could bring were a better documentation system, more effective communication, clearer procedures and potentially increased quality of projects. As a result, to maximize the benefits of incorporating ISO 21500, the company needs to have the top management committed to achieving the standard, they must make decisions on important subjects like documentation and communication, and give proper training to enable employees to incorporate the standard into their daily work. With the increased demand for a standard in project management and for organizations to get the most out of its implementation, it is quite wise to see how to maximize those benefits. It is interesting that “over 24.4 million employees were participating in projects in 11 major economies in 2006. By 2016, this demand will exist to support 32.6 million employees in the same countries” (Denis, 2012). As a result, more and more employees are involved in projects and companies have become more project oriented than ever before. Implementing a project management standard might just be what organizations need to keep up the quality and competitiveness in today’s ever-changing economy.

9. Limitations

It should be mentioned that there are certain limitations to the research since only one company was surveyed as there are relatively few companies that have implemented the standard. Since the standard is relatively new it was considered hard to gain information about which companies were interested in implementing the standard, and strict confidentiality was maintained at the ISO offices over which companies had bought the standard. There has also not been enough research carried out on the ISO 21500 standard and no other academic articles have been written on the subject since it was published in 2012.

In the future, it would be interesting to see a comparison between organizations of what benefits ISO 21500 brings to them, when the ISO 21500 standard is better known and more widely used. Furthermore, it would be interesting to see which processes get more emphasis than others and how they contribute to better quality and efficiency across different industries and different countries.

10. Acknowledgement

This article was written as a part of a research project for the University of Iceland. I want to thank my advisor, Eðvald Möller, and my interviewees, Miles Shepherd and Jouko Vaskimo, and all the participants who helped to make this research possible.

11. References

- Bansal, P., & Roth, K. (2000). Why Companies Go Green: A Model of Ecological Responsiveness. *Academy of Management Journal*, 43(4), 717–736. doi:10.2307/1556363
- Boltanski, L., & Chiapello, E. (1999). *Le nouvel esprit du capitalisme*. Paris: Gallimard.
- Briscoe, J. A., Fawcett, S. E., & Todd, R. H. (2005). The Implementation and Impact of ISO 9000 among Small Manufacturing Enterprises. *Journal of Small Business Management*, 43(3), 309–330. doi:10.1111/j.1540-627X.2005.00139.x
- Chin, K.-S., Chiu, S., & Tummala, V. M. R. (1999). An evaluation of success factors using the AHP to implement ISO 14001-based EMS. *International Journal of Quality & Reliability Management*, 16(4), 341–362. doi:10.1108/02656719910248226
- Corbett, C. J., & Kirsch, D. A. (2001). International diffusion of ISO 14000 certification. *Production and Operations Management*, 10(3), 327–342.
- Denis, E. G. (2012, October 10). *New ISO standard on project management*. Retrieved March 23, 2014, from http://www.iso.org/iso/home/news_index/news_archive/news.htm?refid=Ref1662
- Din, S., Abd-Hamid, Z., & Bryde, D. J. (2011). ISO 9000 certification and construction project performance: The Malaysian experience. *International Journal of Project Management*, 29(8), 1044–1056. doi:10.1016/j.ijproman.2010.11.001
- Douglas, A., Kirk, D., Brennan, C., & Ingram, A. (1999). Maximizing the benefits of ISO 9000 implementation. *Total Quality Management*, 10(4/5), S507.
- Harjung, Lukorito, & Seitz. (2012). Developing International and National standards through ISO. Retrieved from http://community.cleancookstoves.org/user_content/files/002/955/2955562/dceb64fb3e9313de5108c8c9ff23c02f-alliance-iso-standards-process.pdf

- Hart, S. (1995). A natural resource-based view of the firm", Vol. 20 No. 4, pp. 874-907. *Academy of Management Review*, (4), 874–907.
- Heras-Saizarbitoria, I., Landín, G. A., & Molina-Azorín, J. F. (2011a). Do drivers matter for the benefits of ISO 14001? *International Journal of Operations & Production Management*, 31(2), 192–216. doi:10.1108/01443571111104764
- Heras-Saizarbitoria, I., Molina-Azorín, J. F., & Dick, G. P. M. (2011b). ISO 14001 certification and financial performance: selection-effect versus treatment-effect. *Journal of Cleaner Production*, 19(1), 1–12. doi:10.1016/j.jclepro.2010.09.002
- Huang, F., Horng, C., & Chen, C. (1999). A study of ISO 9000 process, motivation and performance. *Total Quality Management*, 10(7), 1009–1025. doi:10.1080/0954412997190
- Ismail, M. Y., & Hashmi, M. S. J. (1999). The state of quality management in the Irish manufacturing industry. *Total Quality Management*, 10(6), 853–862. doi:10.1080/0954412997262
- ISO 9000. (n.d.). *International Standard Organization*. Retrieved May 2, 2014, from http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm
- ISO publish latest survey on ISO 9001. (2012, December 17). *The British Assessment Bureau*. Retrieved July 25, 2014, from <http://www.british-assessment.co.uk/news/iso-publish-latest-survey-on-iso-9001>
- Marimon, F., Llach, J., & Bernardo, M. (2011). Comparative analysis of diffusion of the ISO 14001 standard by sector of activity. *Journal of Cleaner Production*, 19(15), 1734–1744. doi:10.1016/j.jclepro.2011.06.003
- Morris, P., & Hough, G. H. (1988). *The Anatomy of Major Projects: A Study of the Reality of Project Management*. New York, NY, USA: John Wiley & Sons.
- Morris, P. W. G. (2013). *Reconstructing Project Management*. New York, NY, USA: John Wiley & Sons.
- Newton, N. (2010). *The use of semi-structured interviews in qualitative research: strengths and weaknesses*. Retrieved November 20, 2013, from http://www.academia.edu/1561689/The_use_of_semi-structured_interviews_in_qualitative_research_strengths_and_weaknesses
- Packendorff, J. (1995). Inquiring into the temporary organization: New directions for project management research. *Scandinavian Journal of Management*, 11(4), 319–333. doi:10.1016/0956-5221(95)00018-Q
- PMI Standards Committee. (1987). *Project management body of knowledge (PMBOK)*. Project Management Institute.
- Porter, M., & Van der Linde, C. (1995). Green and competitive: ending the stalemate. *Harvard Business Review*, 73, 120–34.
- Schylander, E., & Martinuzzi, A. (2007). ISO 14001 – experiences, effects and future challenges: a national study in Austria. *Business Strategy and the Environment*, 16(2), 133–147. doi:10.1002/bse.473
- Shepherd, M. (2013, January 11). Interview with Miles Shepherd.
- Stellingwerf, R., & Zandhuis, A. (2013). *ISO 21500 Guidance on project management: a pocket guide*. UK: Van Haren Publishing.
- Structure and governance. (n.d.). *About us*. Retrieved October 14, 2013, from http://www.iso.org/iso/home/about/about_governance.htm
- Taylor, W. A. (1995). Organizational differences in ISO 9000 implementation practices. *The International Journal of Quality & Reliability Management*, 12(7), 10.
- Trung, D., & Kumar, S. (2005). Resource use and waste management in Vietnam hotel industry. *Journal of Cleaner Production*, 13(2), 109–16.
- Vaskimo, J. (2013, July 11). Interview with Jouko Vaskimo.
- Wilson, R. C. (1997). ISO 14000 Insight. *Pollution Engineering*, (September), 53–4.
- Zaramdini, W. (2007). An empirical study of the motives and benefits of ISO 9000 certification: the UAE experience. *International Journal of Quality & Reliability Management*, 24(5), 472–491. doi:10.1108/02656710710748358
- Zeng, S. X., Tam, C. M., Tam, V. W. Y., & Deng, Z. M. (2005). Towards implementation of ISO 14001 environmental management systems in selected industries in China. *Journal of Cleaner Production*, 13(7), 645–656. doi:10.1016/j.jclepro.2003.12.009