

Possible Barriers Affecting Implementation of ISO28000 for the Supply Chain

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Abstract— This paper is objective to examine the barrier of ISO28000 implementation. As more and more supply chain process faced disruption and delay due to accident, importance of supply chain security management attract the concern from top management of organization. ISO 28000 is a standard that released in 2007 which specify requirement for security management system for the supply chain. However, there are still many organization didn't apply for this standard. Also, very few, if any, studies have worked on the barriers of this standard. Therefore, past research results about barrier for related ISO standards are reviewed to assist determine the barrier of ISO 28000 implementation. After evaluate the possible barrier, 16 barriers for ISO28000 implementation is identified and explained.

Keywords— Supply chain management, Security management, ISO28000, Barriers.

1. Introduction

Supply chain management obviously represent a group of autonomous firm that are involved through downstream and upstream linkages to add in value by transform raw material to product and services for ultimate customer in the different activities and processes [1]. In short, a supply chain is consists of two or more legally separated organizations, being linked by information, financial and material flows. Those organizations relate to logistic service providers and firm that producing components, parts and end products. Supply chain management objectives are improving competitiveness of supply chain and fulfil customer demand. A firm can increase its competitiveness through provide superior customer service at minimum cost in supply chain retailer-customer stage [2].

Recently, top management of organization put more concern on the rise of supply chain risk [3]. There are more and more accident happen that let supply chain process can't run smoothly. Ericsson's crisis in 2000 is one typical example. Ericsson used single-source policy for production line. Thus, when its chips' supplier faced a fire accident, the material supply for the T28 model immediately disrupted. Ericsson was estimated loss around USD 400 million in this case [4]. Earthquake in Taiwan on December 2006 also is one of the accident examples. The earthquake caused under-sea cables breakage and slowed down in internet. This brings an immediate effect to the containers in Shanghai sea port. Since all application procedures rely on information system, thus slowed down internet caused extend waiting time for the container claim. Supply chain will face delay and disruption when terrorist attack, labour strike, nature disaster and accidents happen [5-9]. In short, any material, information or financial risk could let supply chain faced problem as shown at above examples. Thus, importance of supply chain risk management (SCRM) increased. ISO28000 is among few available standards for supply chain security risk management so this study focuses on this standard.

2. ISO 28000

ISO 28000 (Specification for security management systems for the supply chain) is a standard which specify the requirements for a security management system especially security assurance area in the supply chain [10]. Security management is the safety management for the asset or resource in the organization; it can be physical and digital safety. As further explanation, security management includes all activities and processes which directly where and when have impact on security of organizations, for example, transportation of product in the supply chain. ISO 28000 is developed by Plan-Do-Act-

Check (PDCA) structure. The element of ISO 28000 is based on the ISO format adopted by ISO 9001:2000 and ISO 14001:2004. ISO 9001:2000 specify the requirement of quality management system, while ISO 14000:2004 specify requirement of environmental management [11].

Supply chain risk management can be said as a subset of supply chain management [3], while ISO 28000 is a standard which can improve supply chain risk management in organization. However, in a worldwide ISO survey on 2016, there are only 386 organizations that implement ISO 28000 at that year [12]. Thus, this research paper which to develop the barriers of ISO 28000 implementations. Due to there are still don't have any research about this topic, past research of barriers of ISO 9000 implementation and barriers of ISO 14000 implementations was review and chosen as the possible barrier of ISO 28000 implementation.

3. ISO 28000 barriers

Barrier of ISO 28000 can be classified to external barrier and internal barrier. External barrier is the barrier that caused by outside of organization vice versa; internal barrier is the barrier that caused by inside of organization.

For external barrier, poor legislative framework could bring slow pace for ISO28000 implementation [13]. This barrier is closely related to government commitment towards security issue in supply chain. Malaysia's government had put effort in the logistics of supply chain where they set up Malaysia Logistics Council (MLC) on 2007. But due to the minimal or non-existent fines or penalties for non-compliance standard, many organizations in Malaysia still don't implement ISO 28000 [14].

Next, lack of government support and guidance how to implement also a barrier which stated by Mariotti et al.'s research in 2014 and Massoud et al.'s research in 2010 [13,15]. All governments hope their policies can be implementing on the right time, right budget and can achieve expectation. Government will provide guidance after a new policy released [16]. Even though ISO 28000 is an international standard, it actually also need guidance from government to organization so that they know how to implement it [17]. Besides that, support from government is also important such as improve the knowledge of ISO 28000 certified system to

organization that haven't implement. Government can promote any reward or recognition to organization who implement ISO 28000 as support. Government also can provide technical advice and consultant services for organization who wish to implement ISO 28000 [15].

Cost of certification is barrier for implementation too [15,18]. In more updated research, cost of certification can be classified to implement fees paid to consultancy agencies and auditing fees paid to registration/accreditation agencies. Both of these fees are considering high [13]. If organizations just buy ISO 28000 from ISO webpage, it would cost around RM350. However, able to buy the standard is not equal to able to implement the standard to their organization. When organizations ask consultancy agencies help to implement, it cost higher than buying standard. Different size and different sector of organization may cost differently for consultancy agencies. The greater the size of the organization, the higher the cost of ISO 28000 implementation. This is support by the fact of using online quotation in QMSUK webpage with different size and different sector organization [19]. For organization A from service industry that registers and operates in UK with 66 to 85 workers, with yearly turnover rate range from RM1.3 million to RM2.7 million needs to pay around RM5500 for consultancy to achieve certification. Once the organization certified, around RM 3300 of surveillance audit fees need to be collected. While for organization B from production or manufacturing sector that have more than 126 employees, and having annual turnover rate range from RM4.1 million to RM 5.5 million, as compare, consultancy fees increase to around RM6500 and surveillance audit fees increase to around RM3800.

Thus, if organizations don't have financial support or incentive from government to assist in implementation, organization probably will try to avoid the certification [13,15,18]. As researcher research, in this currently year, there are only Singapore government had financial support for ISO 28000 implementation. Refer to Singapore Business Federation (SBF) webpage, Singapore government promote SPRING Singapore's Capability Development Grant Scheme [20]. Under this promotion, start from 2016, organization that register and operate in Singapore can get assist from SBF to apply financial support from government. Organizations that meet requirement can get 70%

financial support on certification costs, consultancy costs and training related costs for their ISO 28000 implementation. But the requirement set by government is more concern to small medium enterprise (SME). For example, one of the requirement is worker of that particular company can't more than 200 people [21]. Actually, government can give financial support in term of special soft loan to organization wishes to implement ISO 28000 and special tax exemption to organization that get ISO 28000 certification. Lack of financial support or incentive from government could be a significant barrier for ISO 28000 implementation [15].

Large amount of documentation required to prepare is perceived as barrier to implement ISO 28000. It could take long period of time and great deal of resource to preparing the documentation for ISO 28000 certification, this cause the process become burden to organization [13,15]. According to Strahinja Stojanovic, an ISO 9001 expert, organizations need to prepare 22 mandatory document and records plus 14 non mandatory document to compliance ISO 9001 [22]. For ISO 14000, organization need to prepare 17 mandatory document and records plus 8 non mandatory document [23]. Documentations that need to prepare for ISO 28000 are still private information, which means organization do not know what document is needed to prepare before they buy ISO 28000. Besides preparation of documentation, organizations also need to know how to structure their documentation. For example, ISO14000 documentation should arrange from policy based document, then manual based document and so on [23]. This also takes time and resource to done it.

Missing of customer demand for ISO 28000 is a barrier too [13, 15, 24]. Generally, customer will demand for quality or certificated system like ISO is because they which the product quality or service quality of organization could meet their needs. For example, many customers who want to make big investment will choose organization that using ISO 9000 [25]. And customer will feel satisfied if organization could meet their demand [26]. Based on research results of Kimitaka Nishitani, customer demand from environmental market will encourage the number of ISO 14001 adoption where ISO 14001 concern in environment management [27]. Customer in supply chain probably will encourage ISO 28000 adoption too. But if the situation is don't

have any customer demand or very less customer demand the ISO 28000 system, then company could be not consider ISO 28000 is a need for them, especially for company that using pull strategy, this is because they will direct to the customer need [28].

Beside from customer, missing of pressure or demand from government agencies for ISO 28000 is also a barrier [13, 24]. When ISO 28000 is not a legal requirement for organizations [15], organizations have the freedom and right to decide whether want to implement ISO 28000 or not. Lack of relevant regulation and law for security issue in supply chain also count in missing of pressure from government agencies. When company face some kind of obligation or duty from legislation, they probably will start consider ISO 28000 implementation. Some country government concern to supply chain security management, but didn't request organization to apply ISO 28000. Thus, this will let organization lack of motive to achieve regulatory compliance in supply chain security issue [13].

Another barrier identified is missing of supplier demand for ISO28000 implementation [13, 15, 24]. In a supply chain system, aside the customer, supplier play important roles in supply chain activities. Supplier of supply chain can be classified to retailer, manufacturer and distributors. Decision or demand from any of these three sides will bring great impact towards supply chain performance and cost [29]. Supply chain management not only focus on predict customer demand, it need try to adjust behaviour of supplier to meet the customer demand in lowest cost and resource [30]. Thus, demand from supplier could influence decision of organization for ISO 28000 implementation. For example, in ISO 27001 Global Report 2016 stated that there are 71% respondent comments that suppliers, partners or customers request their organization provide ISO 27001 certification evidence. This let organization realized the importance of cyber security and the need of ISO 27001 [31]. Lack of supplier demand for ISO28000 implementation may let company loss focus on importance of security management in supply chain and avoid certified system.

For internal barrier, first barrier to be discussed is benefit of ISO 28000 is not guaranteed [13]. Based on cost-benefit approach (CBA), when an organization want to make decision for provide a service, they should make sure that benefit of that service is same or outweigh the cost [27]. There are

still no researches about the benefit of ISO 28000 implementation. Furthermore, benefits of ISO28000 certification stated in ISO webpage are very less. Refer to ISO webpage, organization can implement ISO 28000 if they wish to maintain and improve their security management system. ISO 28000 also act as conformance of security management policy to outsider [32]. Benefit can be classify to quantifiable and non-quantifiable, while improve quality of security management system is a non-quantifiable. Benefits stated in ISO webpage still no one can guarantee that is truly bring good impact to organization. A view from business view, implement ISO 28000 is an investment. Without the clear information about the benefits of ISO 28000 implementation and quantifiable benefit like financial return of investment that still an unknown, organization's decision for ISO 28000 adoption might be is a no because of benefit not outweigh the costs [18].

Lack of top management commitment towards ISO28000 implementation is a barrier too [13, 15, 24]. Top management often refers to the highest executive or the board of directors in organization. Based on ISO 9001, top management commitment is continuous activity to let every employee understand fulfils customer demand is very important [33]. In Samia Javed research, he found that top management commitment bring positive relation to the quality management of an organization [34]. ISO 28000 is stand for implement, maintain and improving the security management of supply chain in organization. Thus, it also can be a tool for improving the quality of the organization. Refer to ISO9000, top management is responsible for the decision of quality policy. But if top management thinks that implement ISO 28000 didn't bring any benefit to their organization and don't have any customer demand for this certification, top management probably will avoid to adopt ISO 28000 [13].

High cost of changing system to accommodate ISO 28000 let organization avoid ISO 28000 too [13, 15, 17, 18]. Changes for organization are very important in nowadays. Organizations understand that keep doing repeating things just will bring the same results while changing things can let organization achieve a new level. Changes for implement ISO28000 to an organization is not just involve cost of consultancy fees and costs of certificate fees, there are still many procedures to let this policy

managed well. Top management need to show support during ISO 28000 implementation toward every employee in the organization. Then, top management need to let all employees involve in ISO 28000 in order to let employees know the importance of ISO 28000. Organization need to prepare training to employees and need to be done before ISO 28000 fully implemented. All of these steps need time and resource where probably costly especially for training cost [35]. Refer to Preziosi research, one of the reasons for organizations (especially for small and medium enterprises) drop out ISO 14001 is costs of implementation and maintenance the standard is higher than expected [17]. In Mariotti research also state that due to the high burden investment costs is needed to accommodate ISO 14001 requirement, there some Saudi Arabia organizations chosen to drop out ISO 14001 after they initially started the process [13].

Refer to above discuss, implement ISO 28000 need time and resource. Duration of ISO 28000 implementation is a critical point of why organization avoid this system [13, 15]. Every organization had its own objective and goal; they will try to achieve it through many ways. Top management need to do various decisions to achieve those objectives within the lead time. Decision to be made also depends on the priority of the outcome, for example, organization that faced security issue in supply chain may decide solve the issue by the way that used shortest time as compare to implement ISO 28000 which can't solve issue directly. Due to the priority decision, organization will think they had no time to implement ISO 28000 [13]. Time demand for ISO28000 implementation is differs between organization due to the number of employees, the culture and support from top management. There are still no report shows that how long duration is needed to implement ISO 28000 successfully in an organization. Time used for planning stage for ISO 28000 like find advice from expert also count in duration of ISO28000 implementation.

Organization lack of specialist in supply chain risk management also identified as a barrier for ISO implementation too [13, 17, 36]. Specialist or expertise is important to every organization because they having rich knowledge and experience within a specific area. They have the power to influence decision making of organization and can act as consultant for specific area issue [37]. Refer to Mariotti et al. research, organization in Saudi Arabia

that take part in ISO 140001 had employ some foreign expert to assist system implementation process [13]. Organization will face difficulties in understood, explain and perform the ISO standards without a professional advice from expertise. This will effect on organization may not able to start process of ISO 28000 implementation [36]. Specialists in supply chain risk management will know more about the importance of security management in supply chain and probably some of the specialists will had the experience of ISO 28000 implementation. Without these specialists, organization probably doesn't have enough knowledge during decision of investment on ISO 28000 and organization lack of internal support during implementation stage. Furthermore, if organization has specialists in supply chain risk management, they probably can save the costs of consultancy fees.

Another barrier to be discussed is organization lack of knowledge about the certified system [13, 15, 36, 38]. Knowledge management (KM) in organization plays an important role. Based on a research from APQC in KM, its result show knowledge sharing culture will let productivity increase and cycle time of business been improved [39]. Lack of knowledge is defined as knowledge barrier and it was a reason for business failure. Lack of knowledge about the certified system can be cause by lack of information sharing within the industry and organization [40]. Organization may try other method to improve their security management in supply chain because they don't know a certified system is possible to help them. Even organizations know ISO 28000 is released, but due to some information of this standard is private, organizations can't fully understand the system.

Lack of resources in organization is a barrier to ISO 28000 implementation [13, 15, 36, 38]. During the ISO 28000 implementation, some resources is need to continuously supply such as money, management and employee time. Additional security management practice will increase the work load of employee. Besides that, installation of some security tools in supply chain such as track and trace system and detection technology are needed significant amount of money. Management of organization also needs to spare out some time to observe the smoothness of implementation process. A sufficient of resources supply is important to let ISO 28000 can implement successfully. Additional resources also

need to be prepared to prevent any emergent incident. Top management support and continuous commitment will help to maintain the availability of resources [36]. From news from Washington on 08 February 2018, lack of resource is the main challenge for the business who wishes to success with social media [41]. While research from Iman and his friends also stated that lack of resources is one of the reasons for project failure [42]. When an organization faced lack of resources issue for ISO 28000 implementation, top management probably will avoid adopt this standard.

To summarize the literature, table 1 presents the review findings of this article. The table shows some of the barriers which are internally from inside the organization, and some other barriers which are caused by outside the organization (for example government and customers). Validity of the finding is based on comments from experts of the field after presentation of the table.

Table 1. Barrier of ISO 28000 implementation

No.	Barriers	Source
External Barrier		
1	Poor legislative framework	[13]
2	Lack of government support and guidance on how to implement	[13,15,17]
3	High implement fees paid to consultancy agencies	[13,15,18]
4	High auditing fees paid to registration/accreditation agencies	[13,15,18]
5	No financial support and incentive to assist in implementation	[13,15,18]

6	Large amount of documentation	[13,15]
7	Missing of customer demand	[13,15,24]
8	Missing of government agencies pressure and demand	[13,15,24]
9	Missing of supplier demand	[13,15,24]
Internal Barrier		
10	Benefit of ISO 28000 is not guaranteed	[13,18]
11	Lack of top management commitment	[13,15,24, 43, 44]
12	High cost of changing system to accommodate ISO 28000	[13,15,17,18]
13	Duration of implementation	[13, 15, 43, 44]
14	Organization lack of specialist in supply chain risk management	[13,17,36]
15	Organization lack of knowledge about certified system	[13,15,36,38]
16	Organization lack of resources to implement	[13,15,36,38]

4. Conclusion

In conclusion, Performance of Supply chain is crucial for companies [45,46]. Despite of the importance of security of the supply chain, not many studies worked to identify why there are not a considerable number of ISO28000 implementation reported yet (authors only found [47] and [48] which have characterized the ISO 28000 with implementation barriers and/or attractions). Therefore, this study developed a framework to list 16 barriers of ISO28000 implementation; and the barriers are divided into 7 internals and 9 externals. This result is beneficial for supply chain managers and supply-chain policy-makers to ease the ISO implementation and reduce the supply chain risks.

5. Acknowledgment

This study thanks flagship grant, RDU172205, from Universiti Malaysia Pahang.

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