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What are Electronic Information Sharing and Integration Critical Success Factors that Influence the Participation in SMEs?

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Abstract: Electronic information sharing and integration among employees in the private sector is one of the important characteristics to improve decision-making and the quality of businesses. Its purposes are to increase the level of information integration, quality and accuracy while minimizing the cost and time of sharing the information. Thus, there is a need to conduct a study to identify the possible strategies and steps to increase electronic information sharing and integration among employees in SMEs. Technology plays an important role in information sharing and integration. Therefore, SMEs should provide a good IT infrastructure and employ people who have good IT skills for such a purpose. However, SMEs encounter integration issues because of the lack of resources such as financial, data and information. Information integration would be enhanced if SMEs have had a good electronic information sharing. There exists a high degree of information sharing between the employees SMEs now. However, the same cannot be said about electronic information sharing between them which bring difficulties and delay in performing and making decisions. The main objective of this study is to develop electronic information sharing and integration model for SMEs. Qualitative method has been utilized to identify the Critical Success Factors (CSFs). The objective of this study is successfully achieved through sixteen factors that were investigated based on previous studies. From these factors, eight CSFs were selected by validity. The CSFs are (compatibility, IT capability, size, top management support, risk, cost, policy and trust). Our model provides significantly contribute to an overall improvement in the way SMEs share electronic information.

Key words: Information, data, electronic, model, size, management

INTRODUCTION

Information sharing and integration is an essential operation through which employees collectively use their available informational resources (Akbulut-Bailey, 2011; Bigdeli *et al*., 2013; Mohammed *et al*., 2014). To be more specific information sharing, it includes the exchange of information between employees outside or within an enterprise and/or by allowing another enterprise to access their information and data in order to promote decision making (Akbulut-Bailey, 2011; Yang and Maxwell, 2011; Bigdeli *et al*., 2013; Mohammed *et al*., 2015).

Currently, the technical challenge plays an important role in information integration in SMEs (Tekieh *et al*., 2010). Therefore, SMEs should provide a good IT infrastructure and IT skills to integrate the information in this environment (Zhou *et al*., 2008). SMEs in general face low resources issues such as data and information (Zhou *et al*., 2008; Hamid and Abboud, 2013; Abdullah and Hassan, 2015). Therefore, current SMEs face integration issues because of the lack of these resources. Based on these identified issues, the information integration among departments is important (Li and Zuo, 2011). According to Pei and Jia, "the SMEs are relatively weak in information technology and the information management personnel lack the urgent need for information integration". Moreover, SMEs needs information technology to provide critical information integration. The cost is one of the important challenges to build integrated enterprises because they are not able to build by multi-information systems. Sharing the information within the organization across the internet as known as electronic information sharing (Akbulut-Bailey 2011; Bigdeli *et al*., 2013; Mohammed *et al*., 2015). Therefore, electronic information sharing can play an important role in the accuracy of

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information, cooperation among staffs, decrease cost and time; augment productivity for the organization and complete information for best decision making.

Electronic information sharing can be achieved through the use of an IT infrastructure and IT skills including the use of data warehouses, web portals, middleware, applications, computer and the like (Akbulut-Bailey 2011; Bigdeli *et al*., 2013; Mohammed *et al*., 2014; 2016). The difficulty of sharing information electronically across the organization and discovered the essential effects of barriers, incentives and risks on the electronic information sharing (Akbulut-Bailey, 2011). Found that electronic information sharing acceptance is determined by the availability of technical standards, sensitivity of the information, partner's information assurance capability (Bigdeli *et al*., 2013).

Literature review

Previous studies of electronic information sharing and integration: Researchers have extensively studied the area of information sharing and integration which covers some perspectives in electronic information sharing in the public sector. The first Akbulut study focused on the barriers that impact local agency electronic information sharing and integration. The second Ouma (2014) study, focused on information sharing at the public level mainly among statistical departments in the ministries to increase it. Mohammed *et al*. (2014) study was in the higher education sector (between public universities and ministry of higher education and scientific research focused on data warehouse and decision making. Bigdeli *et al*. (2013) study focused in the UK between Local Government Authorities (LGAs) to improve the decision making and information quality.

Electronic information sharing between local agency and state agencies in USA: A study was conducted in a public sector in the USA between government organizations in order to provide more information to allow state organization to improve public services, frame policies and facilitate nationwide electronic information sharing. The 3 barriers are known as technological, environmental and agency which have been studied to understand how they could influence the local organization perspective. As such, it focuses on the barriers that impact local organization electronic information sharing. The research also examined twelve CSFs that can influence the electronic information sharing among local agency and state agencies. The importance of these CSFs to determine which CSF supports or does not support electronic information sharing between the local agency and state agencies (Fig. 1).

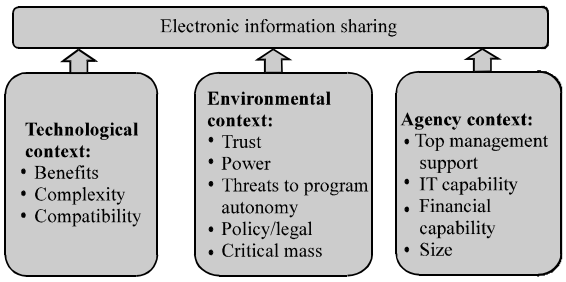

Fig. 1: Electronic information sharing research in the US

This study was the first study of electronic information sharing in the US. Moreover, this was the first quantitative research designed to holistically investigate electronic information sharing in organization level from an empirical and theoretical perspective. The study constituted a major stride toward more understanding the factors influencing electronic information sharing by the public organization. The sampling frame consisted of all organization law enforcement organization in a Southern state of the USA, representing a total of 378 organizations. It also examined twelve factors that can influence the electronic information sharing. As such, the study contributed to the state of the knowledge in inter-organizational information sharing, inter-organizational systems and digital government. Therefore, the study supplied support for the technology, organizational and environmental framework in new context state-local information sharing electronically initiatives.

The questionnaire instrument used in this research was improved by adjusting existing validated instruments and by creating new items to reflect the special of the setting. This psychometrically sound tool can be easily leveraged in future research examining electronic information sharing and integration between organizations (Akbulut-Bailey, 2011). The study examined the electronic information sharing in the public sector. Therefore according to the same author future research should consider information sharing in the private organization in order to promote the findings. Also, Akbulut's study did not focus technical support.

Electronic information sharing in Uganda: The study has been focused on the public sector in Uganda between government organizations. The research has significant effects on managers, policy makers, researchers and academics staff. For example, the public administrators can use the electronic information sharing in order to achieve the needs and expectations of users. The research was investigated four barriers of electronic information sharing among public sectors in Uganda named,

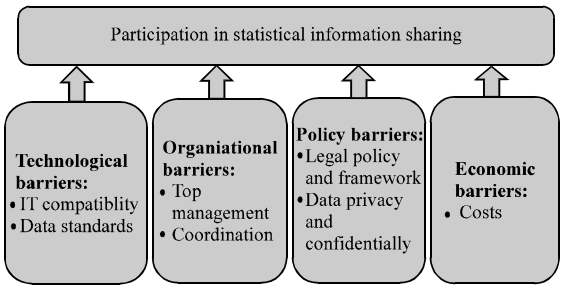

Fig. 2: Conceptual framework: barriers to statistical information sharing amongst government agencies (Ouma, 2014)

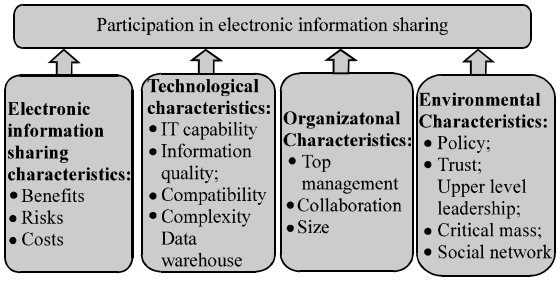

Fig. 3: Framework of electronic sharing information between higher education sectors

technological, economic, organizational and policy (Ouma, 2014). The research also examined seven CSFs that can influence the electronic information sharing. The importance of these CSFs is to determine which factor supports or does not support electronic information sharing among government organizations (Fig. 2).

This study was the first study of electronic information sharing public sector in Uganda. However, compatibility and costs CSFs have been investigated from Uganda's research (Ouma, 2014). The study was not focused on technological perspective. The sample of the research collected only 70. The study examined the electronic information sharing in public sector. Therefore, according to the same researcher future research should consider information sharing in private the organization and non-governmental organization in order to promote the findings (Ouma, 2014).

Electronic information sharing between public university in Iraq: One of the electronic information sharing studies in Iraq was focused on higher education sector between public universities and Ministry Of Higher Education and Scientific Research (MOHESR) in order to improve the decisions making in these universities (Mohammed *et al*., 2014). The 4 characteristics have been identified named; electronic information sharing, technological, organizational and environmental which have been studied to understand the barriers of electronic information sharing in Iraq public universities (Mohammed *et al*., 2014). The research also investigated 16 CSFs that can influence the participation of electronic information sharing among Iraqi public Universities and MOHESR. These CSFs were included in their suitable characteristics. Figure 3 shows the theoretical model of electronic information sharing in higher education in Iraq.

The study was the first study of electronic information sharing in Iraq which focused on the higher education sector. The scope of a study was on electronic information sharing between public universities and MOHESR in order to improve the making of decisions.

It investigated four barriers of electronic information sharing among public sector. It also examined sixteen CSFs that can influence the electronic information sharing. The study has significant effects for managers and decision maker. For example, the public administrators can use the electronic information sharing in order to achieve the needs and improve the decision making. Moreover, it focused also on vertical electronic information sharing. Therefore, currently study focus on horizontal information sharing function (Mohammed *et al*., 2014). The study examined the electronic information sharing in the public sector, therefore, according to Mohammed *et al*. (2015). Future research should consider information in the private organization. Thus, this study has been examined this CSFs in order to find its influence on electronic information sharing in the public sector.

Electronic information sharing in UK: The study has been focused on the public sector in the UK between Local Government Authorities (LGAs). The research has significant effects to improve the decision-making and information quality in the public sector. The research was investigated four barriers of electronic information sharing in Local Government Authorities (LGAs) to discover CSFs influencing the decision-making process in those organization in the UK named, business process, organizational, environmental and technological. The technical CSFs have been illustrated clearly in this research thus, this study has conserved Bigdeli *et al*. (2013) as one of the important studies of electronic information sharing (Fig. 4).

This study was the first study of electronic information sharing in the UK (Bigdeli *et al*. 2013). The study investigated five barriers of electronic information sharing among public sector. However, compatibility, risks and costs CSFs have been investigated from UK's research. It also examined eighteen CSFs that can influence the electronic information sharing. The study was not focused on

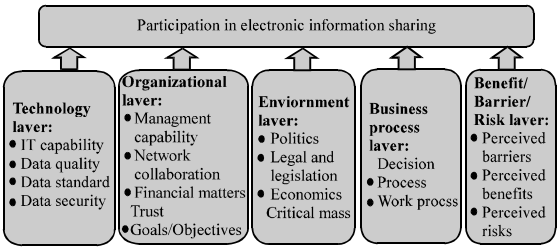

Fig. 4: Conceptual framework: barriers to electronic information sharing amongst government agencies (Bigdeli *et al*. 2013)

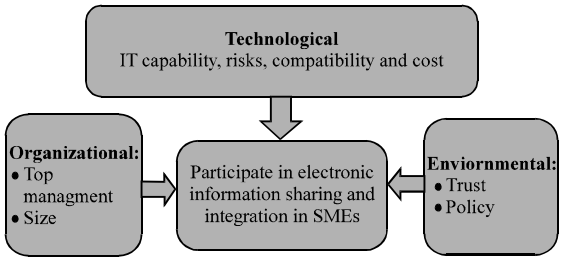

Fig. 5: Electronic information sharing and integration model in SMEs

technical support. The method of UK study was qualitative method (interview) only (Bigdeli *et al*., 2013). The study has significant effects for managers and decision maker. For example, the public administrators can use the electronic information sharing in order to achieve the needs and improve the decision making. Thus, this study is trying to investigate these technological CSFs by a quantitative method in private sectors.

MATERIALS AND METHODS

This research aimed to investigate the CSFs that influence to increase the electronic information sharing and integration in SMEs. The objective of this study is successfully achieved through 16 factors that were investigated based on previous studies of electronic information sharing and integration. From these factors, eight CSFs were selected by PhD and master students who have experiences in SMEs by validity. The CSFs are (compatibility, IT capability, size, top management support, risk, cost, policy and trust). However, Fig. 5 shows the eight CSFs. The methodology of the study is utilized to find the proper way (validity) to achieve the objective of this study (Sekaran and Bougie, 2010). Therefore, these CSFs were categorized to three perspectives such as technology, organizational and environmental. These perspectives have been built based on Technological, Organizational and Environmental (TOE) framework (Mohammed *et al*., 2014).

CSFs influencing information sharing

Technological perspective:

- IT capability
- Compatibility
- Risks
- Costs of technology
- Benefits
- Complexity

Organizational perspective:

- Size
- Top management
- Power
- Employee IS knowledge
- Quality of human
- Resources

Environmental perspective:

- Collaboration
- External influence
- Policy
- Trust
- Critical mass

RESULTS AND DISCUSSION

Electronic information sharing and integration model SMEs: Electronic information sharing refers to the sharing of information between people in order to increase collaborate or get more information (Mohammed *et al*., 2015). The conceptual model of this research will be tested in order to explain and understand the effect of the CSFs. Therefore, a number of studies in this area from different developing and developed countries have been selected as a foundation in this study. The model investigates the technological, organizational and environmental barriers that probably affect the electronic information sharing and integration in SMEs.

The 8 electronic information sharing and integration CSFs named, IT capability, compatibility, risks and cost of adoption the technology, top management, size, trust and policy are (independent variables) that can influence of electronic information sharing and integration in SMEs these technological CSFs have been identified based on the previous models and frameworks of electronic information sharing. Finally, participate electronic information sharing and integration is the main variable in this study (dependent). These CSFs are expected to affect organization electronic information sharing and integration.

Technological perspective: In order to develop electronic information sharing project is necessary to provide a good IT infrastructure. Technological perspective should be checked up before other barriers in order to increase share and integrate information electronically. Technological perspective includes IT capability, compatibility, risks and cost. Cost plays an important role (main role) to provide IT capability.

IT capability: IT capability relates to the use of IT skills and technological infrastructure in an organization to encourage employees to share information electronically (Jing *et al*., 2014). The increase of IT capabilities in the private sector is important in order to develop electronic information sharing and integration. In addition, there is a gap in the IT skills and there is a lack of infrastructure. Understanding technology barriers is the essential step to succeed decent electronic information sharing and integration.

Costs: The costs of electronic information sharing and integration refer to software, hardware that SMEs should provide in order to share information electronically. In addition, training for staff can also affect the adoption of this technology (Bigdeli *et al*., 2013). Moreover, the cost plays an important role (main role) to provide IT capability. However, SMEs faced decision-making issues and within financial problems due to low resources such as data, information, money and IT infrastructure. Therefore, electronic information sharing and integration can increase the resources such as the data and information and can also decrease the time and cost of getting these resources (Mohammed *et al*., 2014).

Risks: Risk of the information is not encouraged the employees to share information electronically (Mohammed *et al*., 2015). Employees might not agree to share her/his information electronically because of risks of losing the information or misuse especially if it is sensitive information. Moreover, the employee also is not willing to share information in order to not distribute their power to others because they think that information is a power. These reasons are not encouraged the employees to share information electronically. Moreover, vast technological risks of sharing information electronically for instance making important information available to strangers (Akbulut-Bailey, 2011; Bigdeli *et al*., 2013).

Compatibility: Compatibility is about the ability to provide equal levels of hardware, software and skills in every organization (Akbulut-Bailey, 2011; Bigdeli *et al*., 2013). Technological compatibility (hardware and software) needed between departments in order to assist the employees to share their information electronically. The different software, hardware and IT skills between participants can cause problems also. Therefore, SMEs should consider investing compatible IT infrastructure and effective training in order to make sure the electronic information sharing perform correctly (Bigdeli *et al*., 2013). Each department follows its own technical standards that make electronic information sharing between them so difficult. For example, the databases of each department do not communicate with anther department due to lack of technological compatibility (Ouma, 2014).

Organizational perspective: Organizational perspective means the internal CSFs that have an influential impact on an organization, thus encouraging the employees to share and integrate information electronically (Akbulut-Bailey, 2011; Mohammed *et al*., 2014). The notion of integrating and sharing information within the organization has been identified as a complicated operation as the objectives and goals are quite diverse between different departments. The entities involved might have different expectations, interests and goals (Bigdeli *et al*., 2013). This research focuses on the following factor.

Top management support: Top management support refers the support of top managers that can improve a better environment in which staffs is encouraged to share information electronically within an organization (Ouma, 2014). Therefore, political leadership and strong management are necessary for the private sector to sustain hard work to encourage the employers to become more creative. Studies have also shown that at the local level, a manager who is interested in electronic information sharing and integration is extremely helpful in overcoming potential obstacles with electronic information sharing.

Size: Size can be measured in terms of a number of organizational assets or the number of employees. The smaller organizations usually lack the technologies and resources needed for electronic information sharing and integration (Akbulut-Bailey, 2011). However, some small organization, especially those with top management support was found to be more keen and novel to electronic information sharing. Therefore, this

research suggests that the size of the organization can affect the sharing information electronically (Mohammed *et al*., 2014).

Environmental perspective: Environmental perspective refers to the effects of the environment on the process of organization. Researchers have explained various influential effects from the environment that the organization cannot disregard. Moreover, environment refers to a regulatory framework which defines the content, scale and standards of electronic information sharing among employees (Akbulut-Bailey, 2011; Mohammed *et al*., 2014).

Trust: Trust can affect the participation of employees in the organization to share and integration information electronically (Akbulut-Bailey, 2011; Mohammed *et al*., 2014; 2015). Moreover, it also improves efficiency and accuracy of electronic information sharing within the organization (Akbulut-Bailey, 2011). Therefore, low trust between staff in provider organization can make issues share information electronically. Trust is perspective as a behavioural characteristic (Bigdeli *et al*., 2013). Trusting another participant in enterprise and collaboration enables knowledge and information sharing efficiently between organization participants.

Policy: Policy and principles laid down by the administrative leadership to guide the team works in the organization. Moreover, according to Akbulut-Bailey (2011) and Mohammed *et al*. (2014). One of the essential factors in the electronic information sharing and integration environment is a policy the politicians may compel extra barriers if each organization has standards and dissimilar rules on sharing information electronically. Moreover, the organization is concerned that without proper policies, electronic information sharing might result in problems related to privacy rights of individuals (Akbulut-Bailey 2011; Mohammed *et al*., 2015).

CONCLUSION

This study is focused on the proposal of increasing the participation in electronic information sharing and integration in SMEs in an organization. The CSFs has been founded based on the previous models and frameworks of electronic information sharing and integration. Technological, organizational and environmental characteristics are the matters that could determine the success or failure of information sharing and integration practice among employees in SMEs.

SUGGESTIONS

However, the next step should be evaluated these CSFs by distributing the questionnaire among staff in SMEs. Finally, SPSS Software tool should be utilized to analysis the data that will be collected later.

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