

Technology factors of electronic information sharing to improve information quality in SMEs

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Abstract : Electronic information sharing is one of the important characteristic that makes the quality of businesses getting better. With the developing of information and communication technology (ICT), sharing the information electronically is increasingly required in order to improve the quality of information and support decision making. Moreover, information quality is necessary to support various several business activities for SMEs. Information problems are considered as a critical challenge to SMEs even in the current era of information availability. Five factors might influence of electronic information sharing in SMEs are named, IT capability, Technological compatibility, Technological risks, Technical support, and Cost of adoption the technology. This considered as independent variables. The paper proposes sharing the information electronically factors in the private sector to increase the quality of information.

1. INTRODUCTION

Moreover, SMEs is defined according to three principles: the annual turnover, income, and number of staffs () but most studies have the definition based on the number of staff in the enterprise .The SMEs sector has a significant role to play in employment creation, poverty reduction and economic development in developing economies. The SMEs largely exceeds the average economic development of economies in most of the countries and contributes significantly to employment creation. However,

The economist opinion gathered on the great significance of SMEs on the production and service sectors in the developing and developed countries. According to (Alam& Noor, 2009) in the developed countries such as the United Kingdom and Australia SMEs account for more than half of all employment and over half of all of all business. Currently, Statistics indicate that these enterprises represent almost 90% of the total enterprises in most economies in East Asia (Ab, Nik, Nizam, &Zain, 2011). Moreover, Statistics show that SMEs in China account for over 99% present of all Chinese enterprises (Lo, 2013). Today, however, the outlook for a stable economy with long-term growth prospects is positive. The importance of SMEs as Iraq rebuilds it the economy and the potential for SMEs finance. The organization in Iraq is referred to be small if a number of employees are the under 10-30 and, medium if it comprises 30-200 staff, according to classification government in Iraq (Abdul-Hamid &Aboud; 2013).

Currently, a definition for the SMEs is still vague; however, there are various classification and definition of SMEs in accordance with investment, employment and sales (Ghobadian &O'Regan, 2004; Beck, Demircuc-Kunt & Ayyagari, 2007). SMEs are usually feeder companies for larger companies and they are essential for development and economic growth (Harash, Al-timimi, &Alsaadi, 2014). It is considered to be the essential source of innovation, flexibility, and dynamism in developing and developed countries, as well as to the economies of most countries (Harash et al., 2014).

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SMEs have a different kind of barriers such as lack of qualified staff, how to enter the markets, lack of knowledge of potential markets, and limited resources and law (Ab et al., 2011). Therefore, SMEs need to be responsive to the markets' changes to face these issues, thus, in order to achieve this goal; the SMEs should utilize electronic information sharing. Nowadays, electronic information sharing and interationis very useful in several SMEs. It is difficult to survive and gain competitive advantage without some implementation or adoption of advanced technological products (Rath, 2012). SMEs are important for creation sources of economic growth and employment creation (Harash et al., 2014). SMEs constitute the essential component of the private sector and a good environment for innovation and creativity because they can help innovations and productivity (Al-tamimi, 2014).

Small and medium enterprises have limited financial support (Abo baker, Mofeta&AbdAlrazak, 2013), thus, they mostly face issues of adoption new technology. However, electronic information sharing is not an expensive technology, especially for SMEs. In addition, electronic information sharing can be adopted by using a social network such as Facebook (Rambe&Ng'ambi, 2011). The desired outcome of information sharing is to improve enterprise overall performance and process.

Small and medium enterprises have limited financial support (Abo baker, Mofeta&AbdAlrazak, 2013), thus, they mostly face issues of adoption new technology. In addition, another problem that SMEs in Iraq are facing is the lack of governmental financial support (Abdulhamad&Awad, 2014). Moreover, SMEs in Iraq do not get financial help from banks to increase their budget and this is a major cause of weak financial capacity to fund its operation (Abdul-Hamid &Aboud; 2013). However, electronic information sharing is not an expensive technology, especially for SMEs. In addition, electronic information sharing can be adopted by using a social network such as Facebook (Rambe&Ng'ambi, 2011).

The volume of information available online and in electronic form has grown exponentially nowadays, increasing the importance of information quality (Chennubhotla& Sadri 2012). However, information quality can improve the overall competitiveness and enhance the supply chain performance.

Information problems are considered as a critical challenge to SMEs even in the current era of information availability (Tarutë&Gatautis 2014). This creates an imbalance of power in processes, which can sometimes cause the processes to go awry, a kind of market failure in the worst case. Therefore, the adoption of electronic information sharing in the private sector is needed in order to provide more information within less time and effort so as to improve performances, decision making and enhance information quality (Akbulut-Bailey 2011; Bigdeli et al. 2013; Mohammed et al. 2014). Moreover, information quality is necessary to support various several business activities for SMEs (Rachidi& El Mohajir 2014). Moreover, the gap of this study is low information quality in SMEs. Moreover, developing an electronic information sharing among staff solve these issues in SMEs, because electronic information can increase information quality and integration (Calo, Cenci, Fillotrani& Estevez, 2012; ABDULLAH, 2015).

Hence, in general, there is a need to study electronic information sharing in the private sector in order to give more understanding about it. Furthermore, according to Yang and Maxwell, (2011), there are difficulties in sharing information in the public and private sector because of the information systems that they use are not well designed to enable sharing of information electronically. Subsequently, this issue of electronic information sharing can cause wasting of time, effort and cost in the private sector. Currently, there are limited studies on electronic information sharing area (Akbulut-Bailey, 2011; Bigdeli et al., 2013; Mohammed & N, 2014). Most of these studies are a focus on public sectors.

Moreover, SMEs in developed countries have a higher success rate than developing countries (Imai, 2015). Therefore, SMEs should focus to improve performance by using electronic information sharing.

2. INFORMATION QUALITY

Information quality is an aspect of information system research that seeks to employ modern practices, theories, management philosophy, organizational information and systems that are related to business processes in order to receive high quality of information (Lee &Haider 2013). Information quality can be enhanced and

improve the decision making in organization (Bigdeli et al., 2013). Information quality determined by seven elements which are: (1) Accuracy, (2) Accessibility, (3) Completeness, (4) Timely, (5) Flexibility, (6) Clearly and (7) Exactly. (Diwasari Ratnaningtyas & Surendro 2014).

There are several concept of information quality exist in the literature:

1. Quality is the totality of advantages of an entity that bear on its ability to satisfy implied and stated.
2. Quality is the degree to which information has form, content and time characteristics, which give it, value to particular end users.
3. Quality is the degree to which information is meeting customer and user requirements according to target user perceptions.
4. Quality is fitness for utilize.

Information quality estimation indicators: usefulness, time limitation, sufficiency, accessibility and reliability (Lin et al., 2011). Information quality is defined as a characteristic where information gives user expectation consistently, both customer and knowledge employees (Gunawan et al. 2014).

2.1. Information Quality in SMEs

With the advent of the information and communications technology, organizations are facing too many new questions and problem about the quality of information, data and knowledge that they have (Chuang & Lin 2013). Nowadays SMEs very important to get high quality of information. Moreover, that quality of information is realized as one of key success elements for SMEs (Gunawan et al. 2014). Therefore, need of high quality of information in SMEs is increase in order to reach work excellent. Moreover, high information quality can be defined as a state that directs SMEs to improve business services and products. SMEs should provide tools to get that high quality of information (Soto-Acosta et al. 2016).

Information quality can enhance the coordination among employees also being competitive advantage for SMEs. Moreover, improve effectiveness and efficiency, innovation, and businesses. Therefore, information quality is the fundamental components and indicators to improve work productivity in the SMEs (Lee & Haider 2013). The most studies were oriented towards the information quality about customer and supplier (Zhu & Zhu 2015). Enterprises management quality mainly depends on enterprises information quality. From the information management perspective, enterprises operation process is actually defined as the procedure with the perception, generation, expression, transmission, processing, and storage utilize the information (Lin et al. 2011). The ability of information quality improvement, transmission and processing has become a lifeline of development and competition of modern enterprises.

Information quality provides leadership styles, innovation and use of various information to improve the decision making. Therefore, SMEs should try to get high quality of information. Under this competitive environment, if the organization need to deliver satisfactory services and products for the customers, they not only want to control the services and products quality in the operation of production, but also need to analyze and trace different factors in each process concerned with the services and products quality in the whole life cycle accurately and rapidly (Chuang & Lin 2013). Therefore, like this competitive environments call for an integrated machine-human system to provide high quality of information.

There are five major attributes of the information quality; availability, accessibility, timeliness, relevance and integrity (Houqe, 2014). Moreover, quality of information plays the important role in the process for decision making (Chua & Banerjee 2016).

By utilizing information quality concept, this study has carried on a type of helpful research to explore on information quality enable to form a unified understanding and analysis current system under the information sharing. This will be useful to take the new thinking of quality measure, control and measure to carry on information quality improvement, and make it better in current problem solution in practice (Houqe et al. 2014).

Currently, the significance of information quality in enterprises (Lee & Haider 2013);

1. Information of high quality may increase customer satisfaction;
2. Information of high quality is providing a valuable asset;
3. Undoubtedly, those facts imply that information quality problems directly impact business performances.

3. BEST PRACTICES FOR INFORMATION IN QUALITY IN SMES

Despite the significance efforts in improving effective solutions and tools to provide information high quality, current approaches are still mostly manual and traditional. There is a highly dynamic flow of data in a situation where most of the relevant data are heterogeneous (Chuang & Lin 2013). However, information quality has become significant sources to achieve sustainable competitive advantage for the business (Ghasemaghahi & Hassanein 2016). Moreover, nowadays in complex environments work; decision making process faces various challenges due to the dynamic of unpredicted events. Therefore, information quality will provide best practices for the business in SMEs. Recent development in information management should use to provide the best management for the business in SMEs. Therefore, benefits from the high quality of information become very important to provide best practice for the business in SMEs. The quality of information in SMEs along with the IT development becomes more and more important for the business (Dai et al. 2016). It is a significant task to collect, mine, use information and to create knowledge to use in the business.

The quality of Information is one of the key essential of information system success. When the quality of information is weak, it can reason a variety of risks in SMEs. Therefore, SMEs should have a high quality of information and used in the best way. Moreover, to manage resources for quality of information enhances efficiency and effectiveness, it is necessary to understand who, how much and where information quality affects SMEs ability to successfully deliver its goals (Borek et al. 2014).

During the operation, information quality is the prerequisite for the development of information sharing in SMEs. From the main characteristics of information sharing, information sharing must solve the optimization of the information quality and the highest benefit of sharing level, in order to complete the value of sharing information (Houqe et al. 2014). The quality of information considered as the determinant of result data operation which can be considered as an input for another operation or be communicate to the user. Information necessary is not only seen by the size of information but also the quality of information. In this case, information quality plays an essential role and should be showed as a successful indicator. Currently, the growing complexity of products and systems, as well as the tightening regulations addressing them, has produced challenges to which existing systems have not replied them completely (Xia 2014).

However, according to recent practical performance, the information quality problems have been an essential obstacle in the effective utilize of information and realization of information value. such as (Chuang & Lin 2013) : sharing barrier among different departments, complicated sources of data, extensive distribution, uniform standard, diversified forms, inconsistent regulations, irregularity of data quality, lower degree of data digitization, poor service quality, low-level repetition, lack of data quality maintenance, and so on (Lirong 2009).

3.1. Model

This part explains the model of study. It also explains factors that effect on participation in electronic information sharing in SMEs. Therefore, the first section illustrates the electronic information sharing model on Iraqi SMEs.

Basically, the conceptual model offers the foundation of using technological factors of electronic information sharing to successful adopt SMEs.

Five electronic information sharing factors named, IT capability, Technological compatibility; Technological risks, Technical support, and Cost of adoption the technology that can adopt the electronic information sharing in SMEs.

Moreover, these factors have been influenced one dependent variable which called participation in electronic information sharing in SMEs in Iraq.

3.2. Electronic Information Sharing Model in Iraqi SMEs

This paper is focused on increase the participation in electronic information sharing in order to improve the quality of information in SMEs. According to Akbulut (2011), there are several issues related to electronic information sharing including technological, organizational and environmental. Specifically, in technological perspective should be checked up before other barriers (Praditya, & Janssen, 2015). Moreover, the technological aspect of the most important aspects of building a successful electronic information sharing project (Mohammed, 2014). Therefore, this study focuses on the technological point of view. Technological perspective should be checked up before other barriers in order to increase share information electronically (Praditya, & Janssen, 2015). Technological perspective includes IT capability, Technological compatibility, Technological risks, Technical support, and Cost of adoption the technology. However, electronic information sharing can be accomplished via utilizing several IT solutions such as website, mobile applications, data warehouses, and so on; (Bigdeli, Kamal, & de Cesare, 2013; Akbulut, 2011). Moreover, there is limited share information electronically among employees in SMEs.

The conceptual model of this study will be tested in order to explain and understand the effect of the technological factors. Therefore, a number of studies in this area from different developing and developed countries have been focused on. The model investigates the technological factors that probably affect the electronic information sharing adoption SMEs.

Participate electronic information sharing in SMEs is the main variable in this study (dependent). Five factors have been founded in this study are named, IT capability, Technological compatibility, Technological risks, Technical support, and Cost of adoption the technology which considered as independent variables.

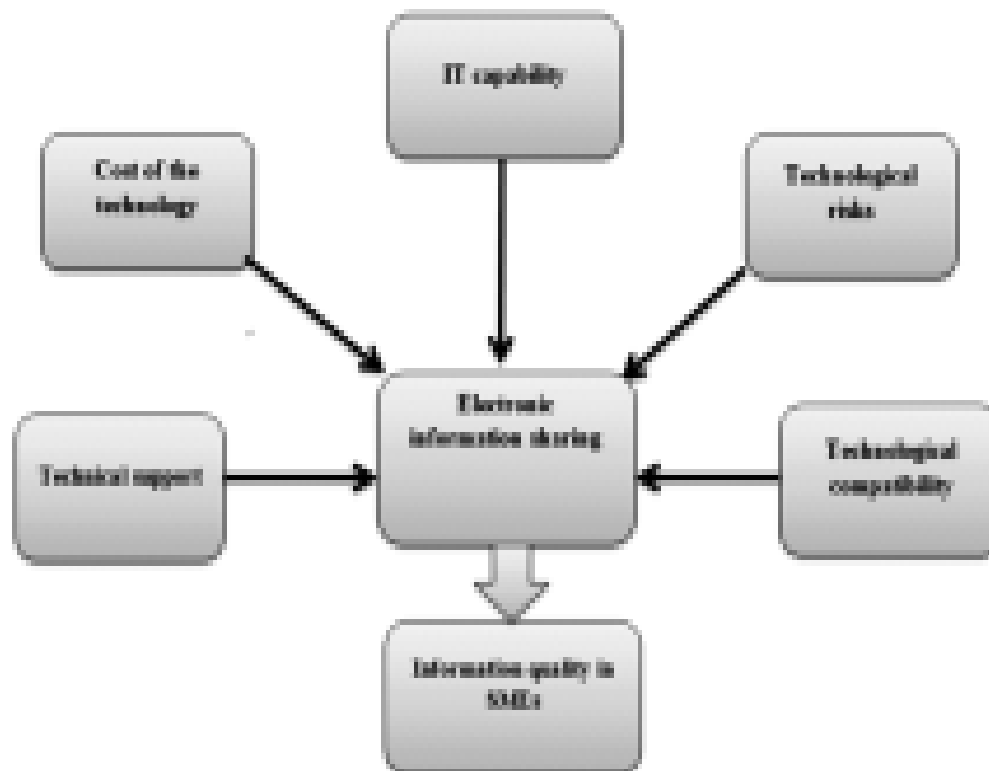


Fig. 1. Electronic Information Sharing Model to improve information quality in SMEs.

The different software, hardware, and IT skills between participants can cause problems also. Therefore, SMEs must consider investing compatible IT infrastructure and effective training in order to make sure the electronic information sharing perform correctly (Bigdeli et al., 2013; Akbulut, 2011; Mannonen & Hölttä, 2013; Abdul-Rahman, 2011). Cost plays an important role (main role) to provide IT capability. SMEs in a general have a low budget so they cannot provide a good IT infrastructure (software and hardware) and training

that eventually can have a negative effect on the adoption of electronic information sharing (Abdul-Hamid & About; 2013). Finally, provide technical supports to solve the problems that SMEs face in software and hardware (Moses et al., 2012). A technological risk of the information is not encouraged the employees to share information electronically (Mohammed et al., 2015).

3.2.1. IT Capability

IT capability relates to the use of IT skills and technological infrastructure in an organization to encourage employees to electronically exchange information (Jing & Pengzhu, 2009). The increases of IT capabilities in the private sector in Iraq develop electronic information sharing (Alwan & Abdurrahman, 2010). In addition, there is gap in the IT skills and there is a lack of infrastructure among government agencies (Ahmed & Hassan, 2012). Understanding technology barriers is the essential step to succeed decent electronic information sharing system. Moreover, IT capability barrier must be checked up before other barriers (Praditya, & Janssen, 2015).

3.2.2. Technological Compatibility

Technological compatibility is about the ability to provide equal levels of hardware, software, and skills in every organization (Akbulut-Bailey, 2011; Bigdeli et al., 2013; Mohammed & Huda, 2014). Technological compatibility (hardware and software) needed between departments in order to assist the employees to share their information electronically (Akbulut, 2011; Abdul-Alrahman & Human, 2011). 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 another department due to lack of technological compatibility (Ouma, 2014).

3.2.3. Cost of Adoption the Technology

The costs of electronic information sharing refer to software, hardware that SMEs should provide in order to share information electronically, and training for staff can also affect the adoption this technology (Bigdeli, et al., 2013). However, SMEs in Iraq has faced decision-making issues and within financial problems (Harash, Al-timimi, & Alsaadi, 2014). Moreover, SMEs in general and in Iraq specifically face low resources such as data, information, money and IT infrastructure (Azarnik, Shayan, Alizadeh & Karamizadeh, 2013). Therefore, electronic information sharing can increase the resources such as the data and information, and can also decrease the cost of getting these resources (Mohammed, Huda & Maslinda, 2014).

3.2.4. Technical Support

Technical support refers to technological services that provide by an expert of technology (technician) such as computers, software products, mobile phones, and other electronic or mechanical goods (Acomb et al., 2007). In general, technical support benefits attempt to help the user to solve specific problems with a product rather than customization, providing training and other support services (Geng & Disney, 2010). The usage of IT and ICT is fundamentally wanted to upgrade, fix and the way of install them (Moses et al., 2012). ICT devices need to be changed in order to be more suitable for the new requirement of the staff and customer (Mannonen & Holta, 2013).

3.2.5. Technological Risks

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 (Akbulut, 2011). 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 (Aiwan & Abdurrahman, 2010). These reasons are not encouraged the staff to share information electronically (Salman et al., 2012). Moreover, vast technological risks of sharing information electronically, for instance making important information available to strangers (Akbulut-Bailey, 2011; Bigdeli et al., 2013).

4. CONCLUSION

This chapter explains the model of electronic information sharing in Iraqi SMEs. The model has been developed based on the previous models and frameworks of electronic information sharing. The purpose of this model is to investigate factors that influence the electronic information sharing in the SMEs in Iraq. However, the next step should be evaluated these factor by distributing the questionnaire among staff in SMEs. Finally, SPSS software tool must be utilized to analysis the data that will be collected later.

Electronic information sharing refers to the sharing of information between employees in order to increase collaborate and to get more information with less time and costs (Mohammed et al., 2015).

5. REFERENCES

1. Abdullah, I. & Z. Hassan 2015. A CLOUD TECHNOLOGY MIGRATION MANAGEMENT STRATEGY MODEL FOR SME'S IN IRAQ: AN OVERVIEW. *Journal of Theoretical & Applied Information Technology* 73(3).
2. Abdullah, N. A. H. N. & S. N. M. Zain 2011. The internationalization theory and Malaysian small medium enterprises (SMEs). *International Journal of Trade, Economics and Finance* 2(4): 318.
3. Akbar, R., M. F. Hassan & A. Abdullah 2012. A framework of software process tailoring for small and medium size IT companies. *Computer & Information Science (ICCIS)*, 2012 International Conference on. 2 pp. 914-918.
4. Akbulut-Bailey, A. Y. 2011. Information sharing between local and state governments. *Journal of Computer Information Systems* 51(4): 53-63.
5. Alam, S. S. & M. K. M. Noor 2009. ICT adoption in small and medium enterprises: An empirical evidence of service sectors in Malaysia. *International Journal of Business and management* 4(2): 112.
6. Bigdeli, A. Z., M. M. Kamal & S. de Cesare 2013. Electronic information sharing in local government authorities: Factors influencing the decision-making process. *International journal of information management* 33(5): 816-830.
7. Calo, K. M., K. Cenci, P. Fillotrani & E. Estevez 2012. Information sharing-benefits. *Journal of Computer Science & Technology* 12(2): 49-55.
8. Crowther, K. G. 2014. Understanding and Overcoming Information Sharing Failures. *Journal of Homeland Security and Emergency Management* 11(1): 131-154.
9. David, W., Y. Ruldeviyani & P. Sandhyaduhita 2013. Analysis and Design of Enterprise Resource Planning (ERP) System for Small and Medium Enterprises (SMEs) in the Sales Business Function Area. *Advanced Computer Science and Information Systems (ICACISIS)*, 2013 International Conference on. pp. 255-260.
10. Dawes, S. S. 1996. Interagency information sharing: Expected benefits, manageable risks. *Journal of Policy Analysis and Management* 15(3): 377-394.
11. Edvardsson, I. R. & S. Durst 2013. The benefits of knowledge management in small and medium-sized enterprises. *Procedia-Social and Behavioral Sciences* 81: 351-354.
12. Estevez, E., P. Fillotrani & T. Janowski 2010. Information sharing in government-conceptual model for policy formulation. *Proceedings of The 10th European Conference on e-Government (ECEG)*. University of Limerick, Ireland. pp. 152-162.
13. Fan, J., P. Zhang & D. C. Yen 2014. G2G information sharing among government agencies. *Information & Management* 51(1): 120-128.
14. Harash, E. 2015. The Role of Environmental Uncertainty in the Link between Accounting Information System and Performance Small and Medium Enterprises in Iraq. *Global Journal of Management And Business Research* 15(2).
15. Harash, E., K. Al-Tamimi & S. Al-Timimi 2014. The Relationship Between Government Policy and Financial Performance: A Study on the SMEs in Iraq. *China-USA Business Review* 13(4).
16. Hoerster, K. D., M. Jakupcak, K. R. Stephenson, J. J. Fickel, C. E. Simons, A. Hedeem, M. Dwight-Johnson, J. M. Whealin, E. Chaney & B. L. Felker 2015. A pilot trial of telephone-based collaborative care management for PTSD among Iraq/Afghanistan war veterans. *Telemedicine and e-Health* 21(1): 42-47.
17. Hu, Q. 2012. Strategy Research on E-Business for Small and Medium Sized Enterprises. *Industrial Control and Electronics Engineering (ICICEE)*, 2012 International Conference on. pp. 1931-1934.

18. Hussein, A. M. 2011. Use Accounting Information System as Strategic Tool to Improve SMEs' Performance in Iraq Manufacturing Firms. TesisUniversiti Utara Malaysia,
19. Inyang, B. J. 2013. Defining the role engagement of small and medium-sized enterprises (SMEs) in corporate social responsibility (CSR). *International business research* 6(5): 123.
20. Islam, M. A., M. A. Khan, A. Z. M. Obaidullah& M. S. Alam 2011. Effect of entrepreneur and firm characteristics on the business success of small and medium enterprises (SMEs) in Bangladesh. *International Journal of Business and Management* 6(3): 289.
21. Janssen, M. & Y.-H.Tan 2014. Dynamic Capabilities for Information Sharing: XBRL enabling business-to-government information exchange. 2014 47th Hawaii International Conference on System Sciences. pp. 2104-2113.
22. Kamal, M. R., D. Singh & K. Ahmad 2012. Factors Influencing Interdepartmental Information Sharing Practice in Electronic Government Agencies. *International Conference Knowledge Management*. pp. 292-298.
23. Khalil, M. A. T., P. Dominic, M. F. B. Hassan, A. Mushtaq& H. Kazemian 2011. A hybrid framework of Digital Business Ecosystem for Malaysian small and medium Enterprises (SMEs). *Computer Applications and Industrial Electronics (ICCAIE), 2011 IEEE International Conference on*. pp. 385-389.
24. Layne, K. & J. Lee 2001. Developing fully functional E-government: A four stage model. *Government information quarterly* 18(2): 122-136.
25. Lin, F.-r., S.-h.Huang & S.-c. Lin 2002. Effects of information sharing on supply chain performance in electronic commerce. *Engineering Management, IEEE Transactions on* 49(3): 258-268.
26. Lo, A. 2013. A case study of small and medium-sized enterprises' entrepreneurial models based on independent innovation. 2013 IEEE Third International Conference on Information Science and Technology (ICIST). pp. 1121-1126.
27. MA, M., H. Ibrahim & M. MohdNadzir 2015. Electronic information sharing between public universities and ministry of higher education and scientific research: A pilot study. *Journal of Theoretical and Applied Information Technology*.
28. Mohammed, M., Y. Eman, I. Huda & A. Thamer 2015. Can or can not? Electronic information sharing influence the participation behavior of the employees. *INNOVATION AND ANALYTICS CONFERENCE AND EXHIBITION (IACE 2015): Proceedings of the 2nd Innovation and Analytics Conference & Exhibition*. 1691 pp. 030020.
29. Mohammed, M., I. Huda & M. Maslinda 2014. Electronic Information Sharing to Improve Decision Making in Public Universities. *Asian Journal of Applied Sciences (ISSN: 2321-0893)* 2(06).
30. Mohammed, M., I. Huda, M. Maslinda, M. GANESAN, E. SUMESH, I. A. NAJM, N. M. HAMMASH, M. ISMAIL, P. FATAH& O. ROSLI 2015. Electronic Information Sharing between Public Universities and Ministry of Higher Education and Scientific Research: A Pilot Study. *Journal of Theoretical and Applied Information Technology* 77(1).
31. Mohammed, M., E. Maroof, A. Thamer& I. Huda 2015. What are the Electronic Information Sharing Factors that Influence the Participation Behavior in Higher Education Sector? *Procedia Computer Science* 72: 49-58.
32. Mohammed, M. A., Y. Eman, I. Huda & A. Thamer 2015. Can or can not? Electronic information sharing influence the participation behavior of the employees. 1691: 030020.
33. Mohammed, M. A., I. Huda, M. Maslinda, M. GANESAN, E. SUMESH, I. A. NAJM, N. M. HAMMASH, M. ISMAIL, P. FATAH& O. ROSLI 2015. Electronic Information Sharing between Public Universities and Ministry of Higher Education and Scientific Research: A Pilot Study. *Journal of Theoretical and Applied Information Technology* 77(1).
34. Ott, J., E. Hyytiä, P. Lassila, T. Vaegs& J. Kangasharju 2011. Floating content: Information sharing in urban areas. *Pervasive Computing and Communications (PerCom), 2011 IEEE International Conference on*. pp. 136-146.
35. Ouma, F. K. 2014. Impediments to interagency statistical information sharing amongst government agencies in Uganda: A G2G adoption. *IST-Africa Conference Proceedings, 2014*. pp. 1-11.
36. Plekhanova, V., K. Hamdan& P. Smith 2012. A role of quality of information for innovation: Leadership style and information management. *Innovations in Information Technology (IIT), 2012 International Conference on*. pp. 344-349.
37. Praditya, D. & M. Janssen 2015. Benefits and Challenges in Information Sharing Between the Public and Private Sectors. *Proceedings of the 15th European Conference on eGovernment 2015: ECEG 2015*. pp. 246.
38. Qu, Y. & Y.-J.Lu 2015. Risk factors analysis for logistics information integration based on the improved AHP-DEMATEL method. *Machine Learning and Cybernetics (ICMLC), 2015 International Conference on*. 2 pp. 648-653.

39. Rachidi, H. & M. El Mohajir 2014. Linking IT and ERP adoption to socio-economic environment: A survey study on Moroccan SMEs. 2014 Third IEEE International Colloquium in Information Science and Technology (CIST). pp. 48-56.
40. Rath, A., S. Kumar, S. Mohapatra & R. Thakurta 2012. Decision points for adoption cloud computing in small, medium enterprises (SMEs). *Internet Technology And Secured Transactions*, 2012 International Conference for. pp. 688-691.
41. Santosa, P. I. & S. S. Kusumawardani 2010. Improving SME ICT utilization through industrial attachment program: Indonesia case. 2010 IEEE Frontiers in Education Conference (FIE). pp. S1J-1-S1J-5.
42. Smit, Y. & J. Watkins 2012. A literature review of small and medium enterprises (SME) risk management practices in South Africa. *African Journal of Business Management* 6(21): 6324.
43. Tarutė, A. & R. Gatautis 2014. ICT impact on SMEs performance. *Procedia-Social and Behavioral Sciences* 110: 1218-1225.
44. Wang, P., P.-L. P. Rau & G. Salvendy 2015. Effect of information sharing and communication on driver's risk taking. *Safety Science* 77: 123-132.
45. Welker, G. A., T. van der Vaart & D. P. van Donk 2008. The influence of business conditions on supply chain information-sharing mechanisms: a study among supply chain links of SMEs. *International Journal of Production Economics* 113(2): 706-720.
46. White, S. 2012. *Micro, Small and Medium-sized Enterprises in Iraq; A Survey Analysis*.
47. Xiao-rong, J. & L. Sui-cheng 2010. The Study on the Influencing Factors on Information Sharing and Information Quality. 57-61.
48. Xiao-wei, W. & L. Run-ze 2013. Empirical research on IPO underpricing of listed companies in China's SME board after GEM. *Management Science and Engineering (ICMSE)*, 2013 International Conference on. pp. 1649-1656.
49. Xu, F., J.-g. Lu & Y.-x. Sun 2003. Application of neural network in image processing. *INFORMATION AND CONTROL-SHENYANG*- 32(4): 344-351.
50. Yan, R. & Z. Pei 2015. Incentive information sharing in various market structures. *Decision Support Systems* 76: 76-86.
51. Yang, T.-M. & T. A. Maxwell 2011. Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors. *Government Information Quarterly* 28(2): 164-175.