

Effective Environmental Factors to Performance of Electronic Information Sharing in Iraqi Intelligence

^{1,2}Thamer Abbas, ²Abdul Samad Shibghatullah, ²Robiah Yusof and ²Mustafa Musa Jaber

¹Iraq Ministry of Interior, Baghdad, Iraq

²Faculty of Information and Communication,
Technology, University Technical Malaysia Melaka, Melaka, Malaysia

Abstract: The objective of this study to investigate the environmental factors that influence Iraqi intelligence community in context of electronic information sharing. This study serve vision of restructure the intelligence products to facing current challenges for counterterrorism. Data collected through survey method from Iraqi intelligence community to validate the selected factors. Thus, this study proposes the environmental factors based on case study through two stage; the first stage we identified the policies and political constraint as an environmental factors. The second stage represented by empirical testing within Iraqi intelligence community, it was found the policies had a positive effect on the degree of electronic information sharing while political constraint had no effect on the degree of electronic information sharing. This study reported herein should be of interest to both practitioners and academics who are deal with electronic information sharing, in general and intelligence agencies collaborative, in particular.

Key words: Intelligence, electronic information sharing, policies, political, factors

INTRODUCTION

The terrorist attack on September 11 was not prevented because of the failure to share information among US intelligence communities. The fast growth of terrorism attacks (i.e., November 2015 Paris attacks, 2016 Brussels attacks and Iraq football stadium attacks 2016, etc). Make warning for decision makers need for enhancing of intelligence products as identified a one of major points of failure leading to these horrific events.

Recently, intelligence has become one of the most widely used groups of antibacterial agents and has been extensively used for decades to counterterrorism (Carter and Carter, 2009). Moreover, the issue of terror has been a controversial and much disputed subject within the field of counterterrorism to find best ways for stop terrorist.

One of the most significant current discussions in order to create a good cooperation is by having coordination between all the intelligence agencies and the security agencies through information sharing (Farroha, *et al.*, 2009; Dahl, 2010). Many study done within intelligence filed in context to develop information sharing concept but limited study focus on factors investigation to develop information sharing model (Raghu and Chen, 2007; Lewandowski and Carter, 2014).

One way suggested to develop information sharing is an Electronic Information Sharing (EIS), referring to exchange data in digital way to reduce the conflict in traditional way (Akbulut-Bailey, 2011).

Quantitative method used in this study to develop context in specific case study, it is typically applied to answer questions about the relationship between calculated variables in order to explain the phenomenon in-depth (Leedy and Ormrod, 2005). This research is going to use a quantitative method to define and explain new variables that may be useful in developing a better framework for increase electronic information sharing between Iraqi's intelligence headquarter and Iraqi's intelligence departments who they deals with counterterrorism.

Deferent case study have a deferent requirements and recognized with deferent factors in order to develop electronic information sharing model (Bigdeli *et al.*, 2013; Fan *et al.*, 2014). Iraq identified one of the worst case in context of terrorist attacks with weak of intelligence's products develop. The outcome of this study to find the influence environmental factors through investigation in Iraqi intelligence, hence as a study directions for develop EIS model.

Critical review on information sharing with intelligence field: In-depth analysis of the prevailing literature on the

topic, It is important to emphasize however that the complexity of terrorism combined with the unique attributes of individual groups makes it nearly impossible to capture the explanatory characteristics of the phenomenon in a single model (Gaibullov and Sandler, 2009; 2011). In the wake of the 9/11 attacks, terrorism grew rapidly, revealing an incomprehensible failure of governments to develop and implement an effective strategy for counterterrorism. Soon after 9/11 it became clear that there had been poor information-sharing within and between all levels and branches of the intelligence community (Regan and Monahany, 2014; Kean *et al.*, 2004). It was painfully evident that current information systems and processes were simply inadequate to deal with threats of this nature (Kean *et al.*, 2004; Popp *et al.*, 2005). It was also evident that if a diverse array of raw information was collected by different intelligence and law enforcement agencies, a mechanism for data sharing that would lead to the data's integration and analysis would be essential. Only in that way would the data become meaningful and valuable to agency personnel responsible for making effective use of it. Recent developments in terrorist attacks have heightened the need for technology use (Chen *et al.*, 2009; Palen *et al.*, 2009; Schneider and Hurst, 2008; Huang and Nicol, 2013; Regan and Monahany, 2014; Ali *et al.*, 2015).

Specifically, there have been many studies concerning the tracking of intelligence problems in the context of information sharing but all suffer from several major drawbacks and a critical review of the literature indicates that academic research on information sharing among intelligence community is limited. After 11 Sep., started attention for pressing need to develop models and techniques based technology into various intelligence products in the context of how information is integrated and shared (Chen *et al.*, 2004; Kean *et al.*, 2004; Halchin, 2004). According to Relyea (2004) Schneider and Hurst (2008), initiatives to increase the sharing of information to fight terrorism are not well coordinated, it lead to lack of effective integration increases the risk that agencies will overlook or never even receive, information needed to prevent a terrorist attack. Thuraisingham (2008) was argues for the need to develop policies for accountability, risk analysis studies, enhanced web services and infrastructures such as data grids. Agencies responsible for counterterrorism should also investigate additional technologies such as collaborative services, social network analysis, surveillance data sharing, digital identity management, metadata extraction and management as well as policies for improve intelligenceproducts. Growing needed to align technology development with the term information-sharing needs of

the Intelligence Community (IC). Policy and governance should support the information-sharing goals of the community and keeps pace with emerging technology and architectures (Farroha *et al.*, 2009). There is more study needed to analyze and addressed the influence factors for developinformation sharing in the intelligence field with context of geographic region has an influence on information sharing and information sharing across geographical differences is an initial step (Carter and Carter, 2009; Lew *et al.*, 2014). Variety of organizational structure within kinds of organizations; degree of automation, organizational structure, culture and the politics are in intelligence from other organizations (Zhang and Dawes, 2006).

The study focused on the policies and political constraints as an environmental factors of electronic information sharing among Iraqi Intelligence community. Found out that a policy approaches and political constraints, should be implemented to facilitate electronic information sharing (Akbulut-Bailey, 2011; Bigdeli *et al.*, 2013).

Formulation of hypotheses: The step begin by investigating literature to explain the employed factors within environmental layer related to proposed electronic information sharing among Iraqi Intelligence agencies. Figure 1 described the formulation of relationship to test the effective factors with concept of electronic information sharing in this study.

Environmental layer: Most of developers to the model envisioned were accounted poorly for the environmental conditions and organisational context of software development. The individual models usually differ in their representation of factors such as the application system's external behaviour, the environmental context in which it will operate or be the most appropriate computational model. Much early activity on a project involved learning about its environment and coordinating the understanding of an application and its environment required constant communication between customers and developers. This layer refers to the characteristics of the environment in which the agency operates. For instance,

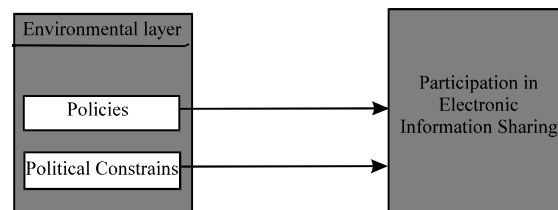


Fig. 1: The formulation of relationship

research has shown that the influence of the external environment such as the social and relational context as well as the regulatory context cannot be ignored (O'Callaghan *et al.*, 1992). Moreover, information sharing among intelligence departments is directly affected by the external environment in which the authority operates (Akbulut *et al.* 2009; Ryan *et al.*, 2008). This also depends on the literature of environmental layer which contains external material that the central and local governments have agreed is needed to support the development of information sharing. The material includes laws, policies/legal framework, political, economic, culture, critical mass, power, threats to programmer integrity and rules to guide information sharing (interagency agreements, information sharing procedures and general legislative authority; (Fan *et al.*, 2014; Jing *et al.*, 2009; Lee and Rao, 2007; Bigdeli *et al.* 2011; Fillotrani and Elsa Estevez, 2001; Pardo *et al.*, 2004; Bigdeli *et al.*, 2013; Akbulut *et al.*, 2009). There is a need to study environment from different dimensions for developing and demonstrating new technologies for homeland security, as this would maintain a scientific and engineering talent with a deep understanding of the various operational and technical issues associated with homeland security projects (Relyea, 2004). In this study, the environmental layer consists of a variety of factors which can act as catalysts for or constraints on intelligence departments' decisions to share information in an electronic manner. Based on academic literature in the context of information sharing and the opinion of the experts in intelligence field, the factors were selected to be employed in environmental layer, namely policies and political constraints.

Policies: Policies and legislations refer to the existence of clear legal norm, regulation, or organisational procedures, formal process for carrying out organisational tasks. Any government activities have to comply with legal and administrative policies (Jing and Pengzhu, 2009). Furthermore, different countries have different policies in this context. Recent day, data and information needed by policy makers to make better decisions and solve complicated problems are available but inaccessible. Besides, different countries have different policies in this context and content and standards of electronic information sharing among government agencies based on formal policies and regulations (Zheng *et al.*, 2009). The set up for various policies for information sharing should meet with requirements of organisations (Fan *et al.*, 2014). The policy defines the rights of government agencies to collect and disseminate information and helps in trust building, risk reduction and

even compulsory enforcement in information sharing projects (Bellamy *et al.*, 2007; Fillotrani and Elsa Estevez, 2010). For instance, agencies may easily abort the sharing with certain excuses, although the information can be shared to some extent when the law is untried (Chang *et al.*, 2009). The established legal and policy regulations regarding information sharing can also facilitate departmental participation, reduce risk, increase trust and make necessary financial funding and resources to make the initiatives of information sharing sustainable (Kamal *et al.*, 2012; Gil-Garcia *et al.*, 2007, 2009). Other than that, it provides policies, governance information or applicable laws that will affect the implementation of the information sharing in intelligence field (Akbulut *et al.*, 2009). Each fusion centre sets its policies to best meet the needs of the agencies it supports (Krizan, 1999). Through the interview, focus group and observation, it has been recognized that the process is still in its early stages and the policies are not well documented in the Iraqi intelligence. There is still lack of a unified national architecture and no formal laws defining the information sharing. In Iraq, the general directorate for policy and requirements has limited capability to generate relevant and applicable defense policies and plans (DoD, 2009). Iraqi government projects require new policies and laws to support agency employers because the policies and laws can increase authority and trust between the staff of agencies. Apart from that rules or laws that can protect the staff when they intend to share electronic information are inexistent. Thus, the current study considers policies and laws as important factors that provide additional support for intelligence community departments' members when they electronically share information. Hence, it could conceivably be hypothesised that:

- H₁: Policy will have a positive effect on participation in electronic information sharing between intelligence departments and intelligence headquarter

Political constraints: The previous studies have focused on either technological or political and organisational aspects of information sharing in organisations, rather than having a holistic socio-technical perspective (Bigdeli, 2012). Researchers pointed out that the challenges of political and organisational aspects are more complex when compared with the technological challenge in projects (Akbulut *et al.*, 2009; Atabakhsh *et al.*, 2004; Brazelton *et al.*, 2003; Landsbergen and Wolken, 1998). This factor refers to the influences of Central Government on decision-making processes of local authorities. This pressure also influences the design, implementation and adoption of Inter

Organisational projects (Fedorowicz *et al.*, 2007). Developing projects according to government organisation needs attention for political and bureaucratic theories. The political environment of government agencies also exerts strong institutional and situational influences on information projects. According to Kumar and Van Dissel (1996), the socio-political view should be incorporated in the analysis of information projects, in addition to technological and rational/economical perspectives. Government agencies have concerns to political issues which may lead to limited of Initiative electronic information sharing. Moreover, political issues were identified as one of the key environmental factors influencing the G2G information sharing and e-services projects (Heeks, 2006; Jing and Pengzhu, 2009, 2007; Zheng *et al.*, 2009). Dawes (1996) can classify benefits of information-sharing projects into three categories, namely technical, organisational and political. He also recognises the benefits of political (supports domain-level action, improves public accountability and fosters programs and service coordination) and barriers of political (external influences over decision making, power of agency discretion and primacy of programs information). Additionally, the political pressure is one of barriers which could limit the attainment of benefits or completely derails an information-sharing project (Gil-Garcia *et al.*, 2007). However, different countries have different types of government agencies. The politics is one of factors that is different in the Eastern countries as compared to the Western countries. Most Western researchers have studied the challenges of information sharing between federal and state governments, or between state and local governments; and protection of political benefits is the one of the hardest obstacles in G2G information sharing. Due to perceived fear of losing political power to others, government agencies may be unwilling to share their information (Fan *et al.*, 2014). At a macro level, political issues have influenced the Inter Organisational relationship; while having criticised the political constraints to share information would not be sufficient to provide a response to a broad range of circumstances, especially with the rapid pace of technological change (Bigdeli *et al.*, 2011). Since, most governmental activities are identified and funded through formal legislations and policies, a consideration on bureaucratic and political factors is required. with different objectives, values and political backgrounds which are involved in the same project (Bigdeli *et al.*, 2013). According to Davies and Mitchell (1994), based on a postmodernism view of power, politics and knowledge, IT can be utilised in political maneuvering and an existing power structure in

organisations can determine the final manifestation of information projects. At least in theory, fusion centres thrive upon the production and exchange of data and the sorting of individuals based on their assigned risk. However, political pressure plays a big role with fusion centres that has the potential to also do much more than this (Monahan and Palmer, 2009; Monahan, 2011). In Iraq, decisions makers are very sensitive when it comes to political issues and pressures; furthermore government projects have to come first with political decisions (Jones, 2007; DoD, 2009, 2010). For instance, most of the political leaders in Iraq have no interest in ICT which may be due to lack of awareness and knowledge on how to use ICT services. Due to this reason, there is a need to develop and increase the awareness on leaders and political decision makers through training courses. Hence, the above literature provides sufficient reasons for considering political constraints as an influential factor for EIS participation in intelligence communities which could conceivably be hypothesised as:

- H₂: Political constraints will have a negative effect on participation in electronic information sharing between intelligence departments and intelligence headquarter

MATERIALS AND METHODS

This research conducted an exploratory case study of an intelligence community electronic information sharing initiative to discover the environmental factors influencing intelligence agencies electronic information sharing. It is identified several technological usages as a depending variables and environmental factors that affect electronic information sharing by intelligence agencies. However, these factors were captured using qualitative methods. Given the relative lack of accumulated knowledge about the subject, utilizing qualitative methods was an appropriate choice. Regardless, the interpretive understanding gained through this study needs to be confirmed and validated through quantitative approaches. Therefore, the use of the survey method is more appropriate for justifying whether these factors influence intelligence agency information sharing (Akbulut *et al.*, 2009; Akbulut-Bailey, 2011).

This research is going to use a quantitative method to define and explain new variables that may be useful in developing a better framework for increasing electronic information sharing between the Iraqi intelligence headquarter and the country's intelligence departments who deal with counterterrorism. The questionnaire depends on the survey that studies the effect of factors

in each of the environmental layer. The reason behind using questionnaires in this study was that the questionnaires allow the anonymity of the respondents which may be particularly valuable when potentially sensitive topics are investigated (Brown *et al.*, 1999). The quantitative research method has the ability to define the benefit of population by generalising the outcomes (Westerman, 2006; Upjohn *et al.*, 2013). This method is typically applied to answer questions about the relationship between calculated variables in order to explain the phenomenon in-depth (Leedy and Ormrod, 2005). Based on this study, questionnaire was employed to test the proposed research hypotheses (Ouma, 2014).

Questionnaire form of this study was adopted from different previous instruments and various studies in various fields and dealt with EIS concepts, these instruments were in the English language. The adaptation combined various instruments and items to measure studied factors, adopted instrument items were modified, refined, reworded or certain words were added to ensure that the instruments were applicable for use in the context of study population (intelligence and counterterrorism keywords). Thus, the questionnaire was translated to the Arabic language on behalf of the legal translation languages office in Iraq called Nihad center to enhance the quality of answers. This is usually done by ensuring that the language is easily understood by respondents, that words with a similar meaning or purpose are replaced and that questions involving general knowledge and words sensitive to respondents are excluded (Zhu and Kraemer, 2005). The policies factor have four measurement items in instrument, these items developed from (Akbulut-Bailey 2011; Lee and Rao, 2007; Mohammed *et al.*, 2015) while the political constraints developed from (Dawes, 1996; Bigdeli *et al.*, 2013; Bigdeli *et al.*, 2011; Pardo *et al.*, 2004), the previous research concerned in IS.5 level of Likert scale techniques was used to measure the factor regard this study (the Likert Scale values started from 1 = strongly disagree and ended with 5 = strongly agree).

There were two factors of choosing the study population. The selected target for population was based on job type and region as the job type focused on any employees working under the control of intelligence or counterterrorism in Baghdad which is the capital of Iraq. Population size for this study is 5,000 members working in whole Baghdad, recognised through interview with the financial department in the intelligence headquarter. According to the survey, paper based survey was distributed fifty percent more than the projected sample size. In order to increase the response rate and to achieve

the target actual sample size (the total distributed number of survey document was 500) (Ness, 2005), the work duration for both distributed and collected instruments went on continuously for 4 months starting from April 2015-August 2015. The total result of collected data was 418 survey documents then was divided into 76 collected through online survey and 342 collected from paper base. The 52 survey documents were eliminated because the survey was filled up incorrectly by respondents. The total net survey documents was 366 which was ready for data analysis using SPSS 21 Software (Krejcie and Morgan, 1970; Given and Olson, 2003).

RESULTS AND DISCUSSION

In this study, we conducted a linear regression to find the effective of independent variables to depended variables started the analysis by reliability for items of each factors to ensure the items collectively measured their intended construct consistently (Gefen *et al.*, 2000). Cronbach's alpha was employed to test the reliability (Straub *et al.*, 2004). The reliability examined in three stages according to this research: 1st in pilot study, 2nd after data collection and 3rd after data analysed. In all stages factors reliability achieved lower standard limit of reliability (0.70). Convergent validity was also assessed at the individual item and construct levels by examining the individual item loadings through factor loading (Akbulut-Bailey, 2011). As shown in Table 1, reliability and adequate loadings.

This study determined the effects of IVs on DVs by employing the liner regression method, to test the hypotheses of this study. The liner regression conducted among two variables in the way that the effects of other related variables are discarded. Furthermore, we used the control variable technique (between the DV with the demographic) with the single regression to find the pure relationships between DV and IVs. Through oneway ANOVA we recognized age had a significant effect on the dependent variable (Sig. = 0 .013, f = 3.668), occupation had a significant effect on the dependent

Table 1: Reliability within three level and factors loading

Factor items	Factor loading	Pilot	Pre-test	Post-test
Policy				
A1	0.753	0.740	0.708	0.711
A2	0.842			
A3 invers	0.904			
A4	0.832			
A5 invers	0.697			
Political constraints				
B1	0.769	0.798	0.722	0.726
B2	0.822			
B3	0.776			

variable (Sig. = 0.155, f = 1.759), experience had a significant effect on the dependent variable (Sig. = 0.007, f = 4.081), work type had a significant effect on the dependent variable (Sig. = 0.053, f = 2.962) and position had a significant effect on the dependent variable (Sig. = 0.004, f = 4.614). Thus, the linear regression run through a principal components analysis on the variables and found; Policy had a positive effect and supported the factor of when to adopt the EIS model within some study cases (Lee and Rao, 2007; Jing and Pengzhu, 2007; Akbulut-Bailey, 2011; Kamal *et al.*, 2012; Fan *et al.*, 2014) while Ouma found that policy had no effect on EIS. The results of this factor stated in H₁ indicated that the policy factor within the intelligence field had positive effects on the dependent variables of electronic information sharing. This result showed that policy could directly increase the EIS between intelligence departments and intelligence headquarter in Iraq. The analysis revealed that policy was positively and significantly associated with SEISP ($\alpha = 0.776$, $p < 0.001$) and it explained the variance of ($R^2 = 0.626$, $p < 0.001$) 62.6% variation and (Adjusted $R^2 = 0.619$, $p < 0.001$). Therefore, the results supported this hypothesis. According to this study, the current policy that used to share the information in Iraqi intelligence was not clear and confusing for the staff and this policy was inherited from the culture of intelligence work. It can be explained that there was no legislation to regulate the process of information sharing between the Iraqi intelligence communities. As a result, the legal basis was set out whether and how information can be shared within any no clear given conditions. The findings of this study indicated that the IIC did not and by itself cannot, offer a sufficiently practical frame work for making decisions about whether or not critical information can be shared.

It can be argued that this issue was more noticeable when it came to sharing information through intelligence departments, since its principles either did not cover or were in contrast with the notion of EIS. Moreover, the

issues of policies were normally interpreted too restrictive and over-cautiously by the departments as a result of misunderstanding, familiarity and a lack of knowledge about its provisions. In this study, policy was commonly cited as a success reason for developing electronic sharing information projects. While the political constraints had a positive effect and supported the factor of when to adopt the EIS model within some study cases (Dawes, 1996; Akbulut *et al.*, 2009; Gil-Garcia *et al.*, 2009), while Bigdeli *et al.* (2011, 2013) acknowledged that this factor had no high priority with the electronic information sharing concept. The results for this factor as stated in H₂ indicated that the political constraints factor within the intelligence field had no effects on the dependent variables of electronic information sharing. This indicated that political constraints did not support EIS between intelligence departments and intelligence headquarter in Iraq. The analysis revealed that political constraints was negative and not significantly associated with SEISP ($\alpha = -0.060$, $p < 0.001$) and it explained its variance of ($R^2 = 0.048$, $p < 0.001$) and 4.8% variation and (Adjusted $R^2 = 0.032$, $p < 0.001$). Therefore, the result did not support this hypothesis. It can be explained that there was a misunderstanding from the participants of this study for the meaning of this factor. With political distractions experienced by Iraq in this period, this factor had been a main influence to the head of departments compared with other participants. According to the findings of this case study, it was noted that the participating departments within the Iraqi intelligence did not have the same level of attention by the central government. With limited resources of the government, it concentrated its efforts on specific departments, especially the Counter terrorism unit with negligence to some sections of the intelligence that might be useful in the context of information sharing shown in Table 2 and 3.

Table 2: Summary for factors analysis results

Factors	Mean	SD	R-correlation	t-value	Sig.
Policy	3.3241	79924	0.783	-1.143	0.254
Constraints	1.8246	0.53229	-0.063	23.437	0.000

Table 3: Explain the barriers and the recommendation based on this study

Factors	Barriers	Recommendations
Policies	Not enough regulation to support electronic data exchange intelligence figures, particularly in regards information sharing Not enough dedication from members Not enough incentives, rewards, or penalties for mistakes	Encourage regulations that support the use of electronic information sharing Put clear technical and information guidance rules in place Put clear technical and information guidance rules in place. Employ standardised policies for the use and distribution of data and enforce these security rules
Political Constraints	Not enough clear authority and leadership in the GoI with a good awareness of the technology and its capabilities. Political turbulence and personal beliefs mean that progress is hindered	Offer formal guidance and rules for financial assistance Employ prototypes as a guide for the understanding of the functions, organisational design, and development restrictions of the IIC, in relation to EIS Establish a team with the necessary tools, permissions and project management skills

CONCLUSION

The Iraqi intelligence worked to promote functions, products and thus improve collaborating among Intelligence agencies. In this study, we did investigation within intelligence environmental layer based on Iraq to find out and determine what factors influence electronic information sharing between Iraqi Intelligence community. We identified and selected policies and political constraints as environmental factors based on previous study and experts' selection. This research found through empirical data, the policies show have significant influence on electronic information sharing. However, political constraints have not been found to be significant.

There were some limitations to for this research. Presently, the conditions in Iraq are not entirely healthy. As such, many obstacles were confronted while carrying out the survey in the intelligence community. The agencies that contributed to the case study were chosen according to their location and random selection. In other words, there is no way to know that if the agencies are a good reflection of the others in the country. The sample data was primarily collected during the same period and thus it fails to reflect the specific circumstances in different developmental phases when agencies participate in the same electronic information-sharing project.

Future work directions should consider investigating with other factors that been neglected by this study might influence agency participation. There are many other hidden variables and topics that are relevant here and they still need to be explored in future studies. The factors investigating should integrate with develop framework/model or theories to increase our awareness and understanding of IOS application and EIS activities. The findings can not generalize to other states and/or types of intelligence agencies. The issue of generalizability is best addressed through replication in different contexts using complementary samples to identify the boundary conditions of our findings. In this respect, future research focusing on initiatives in other states and other types of intelligence agencies is clearly needed. In the end should encourage scholars to focus on doing more researches with all levels of intelligence (technologies, politics, financial, etc.) to cover the issues that prevent stop terrorist attacks.

RECOMMENDATIONS

In light of a thorough literature review, a full and frank discussion on the case study results and the critical response from scholars and experts, the following suggestions for enhancing electronic information sharing,

within the context of the Iraqi intelligence community, have been raised. The influential variables referenced in Table 2 have also been considered.

REFERENCES

- Akbulut, A.Y., P. Kelle, S.D. Pawlowski, H. Schneider and C.A. Looney, 2009. To share or not to share? Examining the factors influencing local agency electronic information sharing. *Int. J. Bus. Inform. Syst.*, 4: 143-172.
- Akbulut-Bailey, A.Y., 2011. Information sharing between local and state governments. *J. Comput. Inform. Syst.*, 51: 53-63.
- Ali, N.S., A.S. Shibghatullah and M.H. Al Attar, 2015. Review of the defensive approaches for structured query language injection attacks and their countermeasures. *J. Theoret. Applied Inform. Technol.*, 2076: 258-269.
- Atabakhsh, H., C. Larson, T. Petersen, C. Violette and H. Chen, 2004. Information Sharing and Collaboration Policies within Government Agencies. In: *Intelligence and Security Informatics*, Chen, H., R. Moore, D.D. Zeng and J. Leavitt (Eds.). Springer, New York, USA., pp: 467-475.
- Bellamy, C., C. Raab, A. Warren and C. Heeney, 2007. Institutional shaping of interagency working: Managing tensions between collaborative working and client confidentiality. *J. Public Admin. Res. Theory*, 17: 405-434.
- Bigdeli, A.Z., 2012. Inter-departmental information sharing in Local Government Authorities (LGAs): The case of the United Kingdom. Ph.D. Thesis, Brunel University London, London.
- Bigdeli, A.Z., M.M. Kamal and S. de Cesare, 2013. Electronic information sharing in local government authorities: Factors influencing the decision-making process. *Int. J. Inform. Manage.*, 33: 816-830.
- Bigdeli, Z., M. Kamal and S. deCesare, 2011. Inter-organisational electronic information sharing in local G2G settings: A socio-technical issue. *Proceedings of the European Conference on Information Systems, (ECIS'11)*, New York, USA -.
- Brazelton, J. and G.A. Gorry, 2003. Creating a knowledge-sharing community: If you build it, will they come? *Commun. ACM*, 46: 23-25.
- Brown, K., P.C. Cozby, D.W. Kee and P.E. Worden, 1999. *Research Methods in Human Development*. 2nd Edn., Mayfield Publishing Co., California, UK.
- Carter, D.L. and J.G. Carter, 2009. The intelligence fusion process for state, local and tribal law enforcement. *Criminal Justice Behav.*, 36: 1323-1339.

- Chang, I.C., H.G. Hwang, M.C. Hung, K.M. Kuo and D.C. Yen, 2009. Factors affecting cross-hospital exchange of electronic medical records. *Inform. Manage.*, 46: 109-115.
- Chen, H., F.Y. Wang and D. Zeng, 2004. Intelligence and security informatics for homeland security: Information, communication and transportation. *IEEE Trans. Intell. Transp. Syst.*, 5: 329-341.
- Dahl, E.J., 2010. Missing the wake-up call: Why intelligence failures rarely inspire improved performance. *Intell. National Secur.*, 25: 778-799.
- Davies, L. and G. Mitchell, 1994. The dual nature of the impact of IT on organizational transformations. *Proceedings of the IFIP WG8.2 Working Conference on Information Technology and New Emergent Forms of Organizations: Transforming Organizations with Information Technology*, August 11-13, 1994, Ann Arbor, Michigan, USA., pp: 243-261.
- Dawes, S.S., 1996. Interagency information sharing: Expected benefits, manageable risks. *J. Policy Anal. Manage.*, 15: 377-394.
- DoD., 2009. Measuring stability and security in Iraq. March 2009. http://www.defense.gov/Portals/1/Documents/pubs/Measuring_Stability_and_Security_in_Iraq_March_2009.pdf.
- DoD., 2010. Measuring stability and security in Iraq. June 2010. http://www.defense.gov/Portals/1/Documents/pubs/June_9204_Sec_Def_signed_20_Aug_2010.pdf.
- Fan, J., P. Zhang and D.C. Yen, 2014. G2G information sharing among government agencies. *Inform. Manage.*, 51: 120-128.
- Farroha, B.S., D.L. Farroha and M. Whitfield, 2009. Challenges and alternatives in building a secure information sharing environment through a community-driven cross domain infrastructure. *Proceedings of the IEEE Military Communications Conference*, October 18-21, 2009, Boston, MA., pp: 1-7.
- Fedorowicz, J., J.L. Gogan and C.B. Williams, 2007. A collaborative network for first responders: Lessons from the CapWIN case. *Government Inf. Q.*, 24: 785-807.
- Fillottrani, P. and E. Estevez, 2010. Information sharing for e-government. *E-Government Theoretical Background Theoretical Background Model Landsbergen and Wolken Landsbergen and Wolken Model*.
- Gaibullov, K. and T. Sandler, 2009. The impact of terrorism and conflicts on growth in Asia. *Econ. Politics*, 21: 359-383.
- Gaibullov, K. and T. Sandler, 2011. The adverse effect of transnational and domestic terrorism on growth in Africa. *J. Peace Res.*, 48: 355-371.
- Gefen, D., D.W. Straub and M.C. Boudreau, 2000. Structural equation modeling and regression: Guidelines for research practice. *Commun. Assoc. Inform. Syst.*, 4: 1-77.
- Gil-Garcia, J.R., I.S. Chengalur-Smith and P. Duchessi, 2007. Collaborative e-government: Impediments and benefits of information-sharing projects in the public sector. *Eur. J. Inform. Syst.*, 16: 121-133.
- Gil-Garcia, J.R., S.A. Chun and M. Janssen, 2009. Government information sharing and integration: Combining the social and the technical. *Inf. Polity*, 14: 1-10.
- Given, L.M. and H.A. Olson, 2003. Knowledge organization in research: A conceptual model for organizing data. *Lib. Inf. Sci. Res.*, 25: 157-176.
- Halchin, L.E., 2004. Electronic government: Government capability and terrorist resource. *Government Inf. Q.*, 21: 406-419.
- Heeks, R., 2006. Implementing and managing e-government. *J. Sci. Ind. Res.*, 65: 845-846.
- Huang, J. and D. Nicol, 2013. Security and provenance in M3GS for cross-domain information sharing. *Proceedings of the IEEE Military Communications Conference*, October 29-November 1, 2012, Orlando, FL., pp: 1-6.
- Jing, F. and Z. Pengzhu, 2007. What factors influence the information sharing across government agencies? *Proceedings of the 2007 International Conference on Service Systems and Service Management*, June 9-11, 2007, Chengdu, pp: 1-4.
- Jing, F. and Z. Pengzhu, 2009. A field study of G2G information sharing in Chinese context based on the layered behavioral model. *Proceedings of the 42nd Hawaii International Conference on System Sciences*, January 5-8, 2009, Big Island, HI., USA., pp: 1-13.
- Jones, J.L., 2007. The report of the independent commission on the security forces of Iraq. September 2007, Iraq. <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA471837>.
- Kamal, M.R., D.S. Singh, V. Singh and K. Ahmad, 2012. Factors influencing interdepartmental information sharing practice in electronic government agencies. *Proceedings of the Knowledge Management International Conference*, July 4-6, 2012, Johor Bahru, Malaysia, pp: 292-298.

- Kean, T.H., L. Hamilton, R. Ben-Veniste, B. Kerrey and F. Fielding *et al.*, 2004. The 9/11 commission report. The National Commission on Terrorist Attacks Upon the United States. <http://www.9-11commission.gov/report/911Report.pdf>.
- Krejcie, R.V. and D.W. Morgan, 1970. Determining sample size for research activities. *Educ. Psychol. Meas.*, 30: 607-610.
- Krizan, L., 1999. Intelligence essentials for everyone. Occasional Paper No. 6, Joint Military Intelligence Coll, Washington DC.
- Kumar, K. and H.G. Van Dissel, 1996. Sustainable collaboration: Managing conflict and cooperation in interorganizational systems. *MIS Q.*, 20: 279-300.
- Landsbergen, D. and G. Wolken, 1998. Eliminating legal and policy barriers to interoperable government systems. Phase II: Recommendations Ohio Supercomputer Center, ECLIPS Program, August 12, 1998, Ohio.
- Lee, J. and H.R. Rao, 2007. Exploring the causes and effects of inter-agency information sharing systems adoption in the anti/counter-terrorism and disaster management domains. Proceedings of the 8th Annual International Conference on Digital Government Research, May 20-23, 2007, Philadelphia, pp: 155-163.
- Leedy, P.D. and J.E. Ormrod, 2005. Practical Research: Planning and Design. 8th Edn., Pearson Merrill Prentice Hall, Upper Saddle River, NJ., USA., ISBN-13: 9780131247208, Pages: 319.
- Lewandowski, C. and J.G. Carter, 2014. End-user perceptions of intelligence dissemination from a state fusion center. *Secur. J.* 10.1057/sj.2014.38
- Mohammed, M.A., I. Huda and M.N. Maslinda, 2015. Electronic information sharing between public universities and ministry of higher education and scientific research: A pilot study. *J. Theoret. Applied Inf. Technol.*, 77: 1-13.
- Monahan, T. and N.A. Palmer, 2009. The emerging politics of DHS fusion centers. *Secur. Dialogue*, 40: 617-636.
- Monahan, T., 2011. The future of security? Surveillance operations at homeland security fusion centers. *Social Justice*, 37: 84-98.
- Ness, L.R., 2005. Assessing the relationships among it flexibility, strategic alignment and it effectiveness: Study overview and findings. *J. Inf. Technol. Manage.*, 16: 1-17.
- O'Callaghan, R., P.J. Kaufmann and B.R. Konsynski, 1992. Adoption correlates and share effects of electronic data interchange systems in marketing channels. *J. Market.*, 56: 45-56.
- Ouma, F.K., 2014. Impediments to interagency statistical information sharing amongst government agencies in Uganda: A G2G adoption. Proceedings of the 2014 IST-Africa Conference, May 7-9, 2014, Le Meridien Ile Maurice, pp: 1-11.
- Palen, L., S. Vieweg, S.B. Liu and A.L. Hughes, 2009. Crisis in a networked world: Features of computer-mediated communication in the April 16, 2007, virginia tech event. *Social Sci. Comput. Rev.*, 27: 467-480.
- Pardo, T.A. and G.K. Tayi, 2007. Interorganizational information integration: A key enabler for digital government. *Government Inf. Q.*, 24: 691-715.
- Pardo, T.A., A.M. Cresswell, S.S. Dawes and G.B. Burke, 2004. Modeling the social and technical processes of interorganizational information integration. Proceedings of the 37th Hawaii International Conference on System Sciences, January 5-8, 2004, Big Island, Hawaii, pp: 1-8.
- Popp, R., K. Pattipati, P. Willett, D. Serfaty and W. Stacy *et al.*, 2005. Collaborative tools for counter-terrorism analysis. Proceedings of the 2005 IEEE Aerospace Conference, March 5-12, 2005, Big Sky, MT., pp: 1-10.
- Raghu, T.S. and H. Chen, 2007. Cyberinfrastructure for homeland security: Advances in information sharing, data mining and collaboration systems. *Decision Support Syst.*, 43: 1321-1323.
- Regan, P.M. and T. Monahan, 2014. Fusion center accountability and intergovernmental information sharing. *Publius*, 44: 475-498.
- Relyea, H.C., 2004. Homeland security and information sharing: Federal policy considerations. *Government Inf. Q.*, 21: 420-438.
- Ryan, B., D. Gill, E. Eppel and M. Lips, 2008. Managing for joint outcomes: Connecting up the horizontal and the vertical. *Policy Q.*, 4: 14-21.
- Schneider, S. and C. Hurst, 2008. Obstacles to an integrated, joint forces approach to organized crime enforcement: A Canadian case study. *Policing: Int. J. Police Strat. Manage.*, 31: 359-379.
- Straub, D., M.C. Boudreau and D. Gefen, 2004. Validation guidelines for IS positivist research. *Commun. Assoc. Inform. Syst.*, 13: 380-427.
- Thuraisingham, B., 2008. Assured information sharing: Technologies, challenges and directions. *Stud. Comput. Intell.*, 135: 1-15.
- Upjohn, M.M., G.A. Attwood, T. Lerotholi, D.U. Pfeiffer and K.L.P. Verheyen, 2013. Quantitative versus qualitative approaches: A comparison of two research methods applied to identification of key health issues for working horses in Lesotho. *Preventive Vet. Med.*, 108: 313-320.

- Westerman, M.A., 2006. What counts as good quantitative research and what can we say about when to use quantitative and/or qualitative methods? *New Ideas Psychol.*, 24: 263-274.
- Zhang, J. and S.S. Dawes, 2006. Expectations and perceptions of benefits, barriers and success in public sector knowledge networks. *Public Performance Manage. Rev.*, 26: 433-466.
- Zheng, L., S. Dawes and T.A. Pardo, 2009. Leadership behaviors in cross-boundary information sharing and integration: Comparing the US and China. *Proceedings of the 3rd International Conference on Theory and Practice of Electronic Governance*, November 10-13, 2009, Bogota, Colombia, pp: 43-50.
- Zhu, K. and K.L. Kraemer, 2005. Post-adoption variations in usage and value of E-Business by organizations: Cross-country evidence from the retail industry. *Inform. Syst. Res.*, 16: 61-84.