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# ELECTRONIC INFORMATION SHARING IN LOCAL GOVERNMENT: THE DECISION-MAKING PROCESS

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## Abstract

*Recently local authorities have been placed under enormous pressure due to problems arising from poor decision-making in relation to the sharing of personal information. While in some circumstances the incompetence of agency employees is identified as the cause, in other circumstances organisational failure, implicitly driven by inter-organisational distrust, is to blame for inappropriate decisions taken with regards to sharing information. Sometimes implicit policies and regulations set by policy makers are blamed, while at other times, explicit rules of confidentiality and data-protection acts are accused. During the last decades, several Local Government Authorities (LGAs) in the United Kingdom have started to employ Inter-Organisational Information Systems (IOIS) to support information sharing and networked collaboration within their departments in order to meet a diverse range of citizen needs including housing services, social care services, education services, etc. However, reaching this level of cross-agency collaboration is not easy and requires additional time and effort by individuals and agencies involved. Therefore, this paper proposes and validates a novel conceptual framework that can be used as a tool for decision-making while sharing information electronically. The framework consists of four main levels: (a) investigation and presentation of factors influencing Electronic Information Sharing (EIS) in LGAs based on external environment, organisational capacity, technology environment, EIS characteristics, and inter-departmental environment, (b) investigation and presentation of the processes that an LGA department should carry out to decide whether to share information with another department, (c) mapping of the influential factors on the participation phases, and (d) prioritisation of the factors influencing EIS in LGAs in different decision-making phases.*

**Keywords:** *Electronic Information Sharing (EIS), Inter-departmental Collaboration, Local Government Authorities, Children Integrated System.*

## 1 Introduction

Information is a key and strategic business asset and fundamental to delivery of public services towards citizens, businesses, and other public organisations. Several studies and reports indicate that Local Government Authorities (LGAs), as the primary interface between central government and citizens, face difficulties in delivering services in an effective and efficient manner. Nevertheless, the dilemma of inter-organisational information sharing has been regarded as an inevitable issue for the public sector. Despite a decade of active research and practice in this complex area, the field lacks a comprehensive framework to identify and examine the factors influencing Electronic Information Sharing (EIS) among government bodies at a local level. The normative research has well investigated and analysed a variety of factors influencing participation in EIS at a central/national level (e.g. Gil-Garcia et al., 2007, Akbulut et al., 2009). However, literature on EIS participation at a local level is limited. This may be due to the complex organisational and technological structures of LGAs. As a consequence further research is required to support decision-making processes in LGAs in relation to inter-departmental EIS at local level. The significance of this research is especially highlighted if one considers that decisions could concern the sharing of sensitive personal information (e.g., racial or ethnic origin, children and youth information, religious or other similar beliefs). It is unfeasible to take a generic view of information sharing. Information sharing itself is neither bad nor good; in some cases sharing information might lead to a disaster, in other situations disaster might be caused by failure of information sharing. The high political pressure for information sharing at a local level could be attributed to a series of well-publicised tragic cases (Bellamy, 2008) including the death of Victoria Climbié in the U.K. as the result of long-term abuse by her guardians in 2000. These cases are just a few examples that illustrate how failure to share information among different departments effectively led to disastrous outcomes. Constant misuse and loss of sensitive information mainly in the public sector show the weakness of these organisations in managing *when*, with *whom*, *what*, and *how* information should be shared. Several studies indicate the differences between the decision-making processes in LGAs and other public or private organisations (Ward & Mitchell, 2004). LGAs are not just the scaled-down version of central government as their human, financial, and technological resources are more limited compared to central governments (Bigdeli et al., 2011). Ward and Mitchell (2004) stated that LGAs, compared to other organisations, have more legal and formal restrictions that decrease the managerial ability to make decisions over a range of organisational operations and processes. There is, therefore, a pressing need to know much more about governmental local level electronic information sharing practices and the social contexts that shape them; to identify factors influencing decision-making processes on whether to share or not to share information with other departments especially when it comes to personal information.

## 2 Investigating Factors Influencing EIS in LGAs

In recent years, several studies have identified and analysed a variety of environmental, inter-organisational, and intra-organisational factors affecting governmental information sharing. We argue that such factors are country and/or sector specific. Therefore, as LGAs represent a unique organisational type compared to other sectors (i.e. private sector) or even compared to central/federal government (Senyucel 2005), the researcher clarifies that additional factors may be indispensable to be identified from the public sector literature. Kurnia and Johnston (2000) clarify that any adopted framework needs to be developed and refined to match the context it is applied to within a certain period of time. So far, EIS has not been widely investigated in LGAs. To the best of the authors' knowledge, the procedural framework on Inter-Organisational Systems (IOS) adoption proposed by Kurnia and Johnston (2000) is the foremost available source of reference in this area. Although, this framework has been evaluated through its application to the private sector, it has been quite widely cited as the basis of some research in the public sector (e.g. Kamal & Alsudairi 2009). Therefore, the main reason why we use this framework as the basis of our research is that this approach has the potential to address objectives of this study. It posits that identifying the influential factors is insufficient to describe adoption without recognising the processes which are undertaken by the adopting agency. This means that the influential factors should be analysed throughout the period when the process of decision is taking place. This framework provides a rich and broad picture of five main environments influencing any IOS initiative (i.e. EIS) which will be explained in the next

section; (a) External Environment, (b) Capability of Organisation, (c) Technology Environment, (d) EIS Characteristics, and (e) Inter-departmental Environment. Through a socio-technical perspective, which theorises any technological phenomena should be investigated and analysed within the context in which they are embedded (Orlikowski, Iacono 2001), we will identify the factors in each factor group by investigating literature on G2G information sharing, inter-organisational systems (IOS), inter-organisational collaboration and Enterprise Application Integration (EAI) and develop our conceptual framework for EIS in LGAs.

### **2.1 Investigating External Environment Influencing EIS**

EIS between governmental agencies is directly affected by the external environment in which the agency operates (Akbulut, Kelle et al. 2009, Pardo, Tayi 2007). This external environment consists of a variety of factors which can act as catalysts for or constraints on LGAs' decisions to share information in an electronic manner (Fedorowicz, Gogan et al. 2007). Based on normative literature on information sharing in the public sector, we have divided the external factors into four key categories: (a) *Political Environment*, i.e. the influence of central government on decision-making processes of local agencies; (b) *Economic Pressures*, i.e. the central government's economic conditions (level of employment, recession, inflation, etc.), which impact on local agency collaboration; (c) *Legalisation and Policy Principles*, i.e. the information sharing policies that, in theory, should create an environment in which sharing information among agencies become effective and legitimate; and (d) *Community Pressures*, i.e. the concerns of the public over data privacy and data protection which influence the decision of LGAs to whether or not share personal information.

### **2.2 Investigating Organisational Factors Influencing EIS**

In the context of this research, capability of organisation is referred to characteristic of the entire LGA and not to individual department and section. Sharing and integrating information among different departments within an organisation directly depends on building and maintaining network relationships and collaboration (Fedorowicz, et al. 2007, Gil-Garcia et al. 2009). The formation of these collaborations and co-operations is a complicated task as different departments have different goals and interest as well as different human and knowledge capabilities. Based on reviewing literature on personal information sharing in the public sector, we classified organisational capability into four key categories: (a) *Inter-organisational Leadership*, i.e. the existence, ability and commitment of top management to provide an optimistic environment in which sharing information among different department can take place; (b) *Return on Investment (ROI)*, i.e. the analysis of both tangible and intangible costs, benefits and risks which would directly influence the decision on whether or not to share information in an electronic manner; (c) *Network Collaboration Culture*, i.e. transform the culture of those agencies that previously operated in an isolated environment and now are forced to work as part of a collaboration network; and (d) *Organisational Size*, i.e. an organisation's resources, transaction volumes and workflow size which can be recognised through the size of the community served and the number of services provided.

### **2.3 Investigating Technological Factors Influencing EIS**

According to Tornatzky and Fleischer (1990) technological context consists of internal and external technologies that are relevant to the organisation's processes. Over recent years, enabling more efficient uses of information as a result of new technologies have transformed and are continuing to transform the processes in organisations especially in the public sector (Thomas & Walport, 2008). Although governmental organisations have lagged behind in terms of the technology they deploy, new IT tools especially Web-based applications are becoming more and more prevalent in local agencies. Technological advances have had drastic impacts on inter-organisational relationships and collaboration, the way they collect, store and share personal data among them. However, the issues of IT capability, meaning and semantic translations of data gathered from a variety of sources (Pardo & Tayi, 2007), integration among different corporate IT systems (Lam 2005), and citizens' privacy protection are central to sharing information from diverse and distributed sources such as databases and inter-agencies' intranet. Therefore, based on the relevant literature on inter-agency collaboration and information sharing at the local level, the authors divided the technological environment into four

main categories for further investigation: (a) *IT Capabilities*, i.e. the ability of an LGA's department to effectively apply IT tools to achieve the desired outcome which is to share information with other departments; (b) *Data Security and Privacy*, i.e. tensions among public agencies regarding sharing citizen information with a secured and protected approach; (c) *Information Quality*, i.e. building a common perspective towards information quality in inter-agency collaboration; (d) *Technical Interoperability*, i.e. define compatibility standards to be adopted among a variety of information systems implemented in organisations.

#### **2.4 Investigating EIS Characteristics Influencing EIS Participation**

The influence of characteristics of technological innovations on decision processes has been regularly researched in both the private and public sectors. Zaltman et al. (1973) discovered more than 21 characteristics of innovation, which were gathered mainly from the literature on diffusion of innovation. Rogers (1995) also identified the attributes of innovation, which have a key role in acceptance and decision adoption including benefits, cost, complexity, risk, trialability, and observability. Damanpour and Schneider (2009) stated that compatibility, relative advantage and cost are the most cited innovation characteristics that influence the adoption decision. These hypotheses along with other organisational and environmental characteristics were tested on the adoption of 25 innovations in 725 local governments in the United States. However, the authors suggested that more research on the influence of innovation characteristics on innovation adoption in public organisations is required due to the differences in organisational structure and characteristics in the public sector. After reviewing the literature on personal information sharing in the public sector, we divided the EIS characteristics into three categories which will be discussed in depth: (a) *Costs of EIS*, i.e. all perceived potential costs of participation in information sharing; (b) *Benefits of EIS*, i.e. perceived gains through participating in electronic information sharing; and (c) *Risk of EIS*, i.e. concerns about expected technological and non-technological risks.

#### **2.5 Investigating Inter-departmental Factors Influencing EIS**

Since the initiative of this research is to identify factors influencing EIS in a LGA, it would be essential to examine the relationship among different departments as well as their business and operational processes. Working collaboratively across organisational divisions, departments and sections is now an indispensable component of organisational life. These horizontal arrangements between different departments, which improve the delivery of public services, have been often referred to as "network" in the scholarly literature (e.g. Fedorowicz et al., 2007). In the context of inter-agency information sharing, forming and maintaining these networks act as a foundation (Pardo & Tayi, 2007). However, working across different departments and sections in a networked style is not easy and requires additional time, money and effort (6 et al., 2005). Relevant research findings show that public organisations have difficulties in order to establish such network collaborations among their departments. They face complications over integrating departmental business processes (Pardo & Tayi, 2007), creating trust and restructuring departments arrangement (Pardo et al., 2006). Therefore, based on the normative literature on information sharing in LGAs, this study categorises the inter-departmental factors into three main groups: (a) *Decision and Business Process Reengineering*, i.e. harmony in the business processes of participating agencies; (b) *Inter-departmental Trust*, i.e. mutual trust among different departments and among networks of individuals and organisations who should collaborate; and (c) *Critical Mass*, i.e. number of agencies that are participating or planning to participate in EIS efforts which might influence the decision of other agencies that have not started this initiative yet. Based on the above discussions, the authors propose the following research proposition:

***Research Proposition A – Proposed Factors Influencing EIS: The proposed factors may influence the decision-making process on electronic information sharing in inter-agency collaboration in local government authorities.***

### 3 Investigating the Phases of EIS Participation

Sharing information through IOIS can be considered as an innovation not because it utilises new technologies, but because it enables reengineering of existing processes and workflows (Fedorowicz & Gogan, 2010). Therefore, participation and adoption of information sharing in inter-agency collaboration, similar to any other innovation adoption, involve a sequence of stages that an agency goes through while sharing information electronically. Recent literature on innovation adoption in the private sector has coined the notion of “*open innovation*” where two innovative agencies with diverging strategies and capability may collaborate for a better outcome. In this type of innovation environment, the adoption is largely dependent on the characteristics of network collaboration. The authors highlighted that the successful implementation and adoption of any partnership effort, such as EIS, is reliant upon other partners’ capability and resources. Regarding inter-agency information sharing in LGAs, it would be vital to clarify the stages that each department goes through prior taking part in the information sharing effort. After analysing the private sector (e.g. Damanpour & Schneider, 2009) and public sector (e.g. Kamal, 2006 and Walker et al., 2011) innovation adoption literature, the researchers propose five phases as important to sharing information electronically: (a) ***Incentive*** refers to the state when a department within an LGA is asked or wishes to share information with another department electronically. Rogers (1995) reported this phase consists of activities that assist the organisation recognising a need and becoming aware of the existing innovations; (b) ***Conception*** signifies a plan of action which the agency should pursue (Kamal, 2006), which in the context of EIS, may consist of a set of questions to be answered by the LGA department prior to sharing information. These questions include, for example, whether or not the department has a legal basis for sharing information, if the information enables the individual(s) to be identified, information confidentiality, etc.; (c) ***Proposal and Agreement*** which indicates the formal proposition for adopting any kind of innovation within the organisation (Kamal, 2006). In the context of EIS, the proposal can be done through a kind of protocol, or agreed set of principles, on sharing personal or confidential information; (d) ***Participation Decision*** which refers to the actual phase in which the department takes the decision on adopting the specific innovation (Kamal, 2006). Regarding the EIS initiative, a final decision should be made when the department has passed through all the above stages; and (e) ***Sustainability*** which refers to the stage in which an organisation begins to realise the need for strategic changes towards the use of innovation (Kamal, 2006). This step might be considered a post-adoption stage, however in the context of EIS in the public sector, it is a vital stage since sustainability in inter-agency information sharing is fairly complex. Most of the information sharing efforts in government agencies are considered on a case-by-case basis rather than a sustainable basis. The proposed phases have yet to be evaluated in practical cases; hence the authors propose the following research proposition:

***Research Proposition B – EIS Participation Lifecycle: The departments within an LGA will go through numerous phases while deciding to share information electronically with other departments.***

### 4 Mapping EIS Participation Factors on Participation Phases

Existing studies on electronic information sharing in different sectors, such as healthcare (e.g. Mantzana, et al., 2008) and SMEs (e.g. Welker et al., 2008), have examined a variety of issues, the role of the main stakeholders and causal relationships among and between different participating departments. Yet from a conceptual and empirical point of view, none of the existing research on EIS, even in the public sector, has investigated the mapping of factors influencing EIS participation on its different phases. This represents a gap in the relevant literature that is important to investigate since: (a) the identified factors should be tackled within the stages of participation, and (b) by breaking down the issues and challenges in different phases of participation, decision-making on how to solve these issues becomes easier for the organisation. With these arguments, we point out that it is worth examining the mapping EIS participation factors on participation phases in local government authorities. The actual mapping would be carried out after conducting the empirical research and we propose the following research proposition to be investigated:

**Research Proposition C – Mapping EIS Participation Factors on the Lifecycle Phases:**  
*The factors influencing EIS participation in inter-agency collaboration in LGA can be mapped onto different phases of participation to support the decision-making processes on sharing information electronically.*

## 5 Investigating the Prioritisation of Factors

Several perceptions on the prioritisation of factors influencing a phenomenon in an organisation have been indicated in the literature on management and information systems (e.g. Lam & Chin, 2005). Prioritisation can be considered as the process of ranking all factors regarding their relative need or importance which would assist the decision-making processes in an organisation (Kamal & Alsudairi, 2009). To a great extent, prioritisation of factors may determine whether or not the inter-agency information sharing effort would have a constructive result(s). The existing literature on information sharing and integration in inter-agency collaboration mainly focuses on examining the causal inter-relationship between the factors (e.g. Pardo & Tayi, 2007) and the inter-relationship between the factors and actors (e.g. Lips, et al., 2011). To the best of our knowledge, none of the existing studies on information sharing and integration has investigated the prioritisation of factors influencing EIS participation within the participation phases. It is important to understand all aspects of participation in inter-agency EIS prior to starting the effort since this type of initiative can be classified as a high-risk inter-organisational project. Thus the following research proposition can be proposed for investigation:

**Research Proposition D – Prioritisation of EIS Participation Factors:** *Prioritisation of factors in each participation phase can influence the decision on EIS participation in inter-agency collaboration.*

The arguments reported in the previous sections demonstrate that the role of factors, participation phases, mapping of factors onto participation phases, and prioritisation of factors within the participation life-cycle should be taken into consideration while sharing personal information electronically in inter-agency collaboration in local authorities. We propose that the research propositions (RP-A to RP-D) should be examined jointly. In doing so, a detailed conceptual framework for electronic information sharing in local government authorities is proposed in Figure 1.

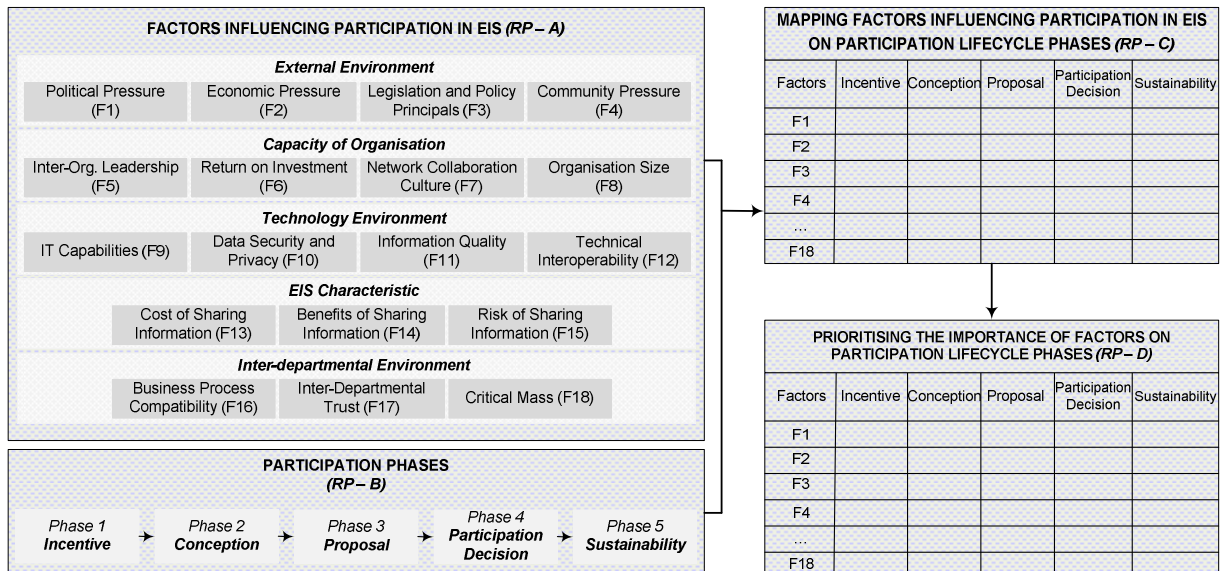


Figure 1. Proposed Conceptual Framework for EIS Participation in LGAs

## 6 Research methodology

The research is based on three phases namely: (a) research design, (b) data collection and (c) data analysis (Jankowicz, 2005). This paper attempts to investigate and analyse how personal information

is electronically shared in inter-agency collaboration in local authorities. Hence, the researchers have carried out an interpretive, case study approach in order to examine the research propositions. The reason for selecting this approach is that we seek to understand the human thoughts on EIS efforts within the social and organisational context surrounding the initiative since the social world cannot be reduced to isolated variables, such as space and mass, it must be observed in its totality (Klein & Myers, 1999). Therefore, the authors assert that, there is a need for a research approach that may allow LGAs to be viewed in their entirety and permit the authors to get close to participants (i.e. the interviewees), penetrate their realities, and interpret their perceptions. Hence, the authors consider interpretivism as more appropriate for the research reported herein. Since the phenomena of inter-agency collaboration in general, and EIS in particular, are less acknowledged in LGAs, a case study approach was applied to investigate the objectives in depth, to obtain richer primary data, and to reveal its deep structure within the organisational context. As the main intentions of this study are to first, present the status of information sharing in inter-departmental collaboration in the UK, and second, to analyse and examine a variety of issues influencing decision-making for EIS participation, three local authorities have been selected as the case organisations to be examined. There are several reasons why these organisations were selected to address the objective of this study. *Firstly*, these LGAs are among those few LGAs across the country that have initiated the effort of EIS by developing and implementing IOIS. *Secondly*, the researchers have selected one case in England, one in Wales, and one in the capital London. As the issues (e.g. political, financial, technological, cultural, etc.) are essentially different in these three areas, the aim was to compare how each LGA would react to the notion of EIS regardless of their similar organisational structures. *Lastly*, since this research focuses mainly on the sharing of *sensitive* information, not many LGAs were willing to share their views, experiences, and even tragic stories regarding EIS. This has resulted in a limited number of organisations being selected. As the length of this paper is limited, the results and analyses of just one case-organisation (located in Wales) will be reported in the next section. For confidentiality reasons the authors employ a coded-name as LGA\_NW. As part of the data collection, four semi-structured face-to-face interviews (about an hour and half each) were conducted based on a detailed questionnaire. All interviewees had a key role in the inter-agency collaboration effort including the Head of the ICT Department (HICT), the IT Systems Manager (ISM), the Principal Team Leader in the Children and Youth Service Department (PTL), and the Project Manager in the Education Services Department (PM). In order to prioritise the factors based on their importance (RP-D), the research adopted the Analytical Hierarchy Process (AHP) which has been widely applied in the field of IS. This allows each decision maker to choose (according to his/her preferences) that a specific EIS factor is more important over other factors. AHP has the advantage of a detailed stepwise comparison mechanism over other techniques, i.e. the ability to check for and to reduce any inconsistency scores there and then, and also the opportunity in one exercise to obtain decision-makers prioritisation responses (Saaty, 1986). The rationale for choosing AHP, despite the controversy of its rigidity, is that this technique is well suited for decision-making and offers numerous benefits as a synthesising mechanism for decision-making. In the analysis of the case study, a pattern-matching logic was employed. This technique compares an empirically based pattern with a predicted one (Yin, 2003). Therefore, as we first formed the conceptual framework (Figure 1), this technique would be appropriate to compare the data from the literature (predicted ones) with the data gathered from the interviews (empirical ones).

## 7 Case Data

To address the objective of this research and test the aforementioned research issues, several case studies were undertaken in the United Kingdom in which we will present just one of them in this paper. The case organisation (LGA\_NW) is a UK unitary LGA located in the North West of the country which provides all major services such as education, social services, leisure, planning and highways, etc. The council serves a population of 112,000, a staffing establishment of 6,500, and annual IT revenue budget of about £2.5m. Several departments within LGA\_NW involved in children support services (e.g. Education Services Department, Social Services Department, etc.) are concerned about handling information since they own and manage their own applications and databases. One of the major services regarding children in LGA\_NW is providing education support to children with



special needs (e.g. disabled children, children living with single parents, etc.). Currently the authority follows a hub approach where the various systems holding data on children are linked together using a variety of data standards and data matching methods to allow all the systems to talk with each other. A child's details held in an education database, for example, need to be matched with the same child's record in the social services system. Any small difference in any part of the details (e.g. name, address, etc.) causes difficulties in information being matched and in the delivery of the specific service. In this situation, where each service uses a different system and database, when a child comes to the attention of a new service, a new record is created from scratch and needs to be matched with other systems manually. Moreover, the departments are not aware of the information held on a specific child within another department. This has effectively resulted in some tragic cases across the county. As a result of running multiple systems, operational performances are intensely slow and the departments had to rely on paper-based information sharing in order to deliver the education support services. Therefore, with the assistance of a multinational software company, LGA\_NW started piloting an integrated system to manage the complex home-to-school transport of pupils with a statement of special educational needs and/or special transport needs more efficiently. The motivation behind this pilot project was to address the limitations of the existing systems, and to reach the goal of "Every Child Matters". The system connects directly with an integrated database consisting of data of routes and vehicles controlled by the Highway and Infrastructure Services Department, data of school locations controlled by the Education Services Department, details of pick-up points controlled by the Housing Services Department, and data of pupils controlled by the Social Services Department. The system assesses the eligibility of using this service based on statutory regulation defined in the authority, examines the route information including stop times, maps, loading data, etc. through integration with a Geographic Information System (GIS), matches designated vehicle and driver and directs them to the designated pick-up point through integration with a Fleet Management System (FMS), and records all the operational actions on a regular basis. It is also integrated with two external School and Private Transportation Systems in order to increase the quality of records of families and children using this service. This project is considered as a large and complex project since it requires constant inter-departmental collaboration of four major departments within the council in order to manage the transportation of around 3,000 mainstream pupils and 720 with a statement of special needs among 110 schools. The pilot project including migration of nearly 60% of children and school data from the old system to the new one and the training of four staff from each department was completed in December 2010. However, the integrated system is not fully functional to date as the LGA's external and inter-departmental environment has negative influences on the implementation of project. The HICT reported that "... we are faced with a complex situation regarding the technical aspects, but generally speaking, from a technical point of view, the project was fairly feasible to implement. However, there was an immense resistance from all departments as they alleged that information sharing would allow to put in jeopardy the safety of a child or young person ...". In the next section we will analyse these influences and present the testing of research issues highlighting the empirical results.

### **7.1 Testing Research Proposition A: Proposed Factors Influencing EIS**

Table 1 follows a scale similar to the one used by Miles and Huberman (1994), i.e. scale of less important (○), medium important (⊙) and most important (●). The main argument in the External Environment category was around the Economic Pressure as the PM clarified that "... in this situation when our budget has enormously cut, implementing of such projects becomes far from easy, but missing the risks and opportunities from not sharing information might be an even more expensive option ...". In the Capacity of Organisation category the interviewees reported that the capacity of the LGA as a whole would be positively influential in the project, however, the ISM replied that "... the culture of employees has been shaped based on the bureaucratic structure of the LGA where the boundaries among departments are thick. Therefore, lack of network collaboration has been acting as a blockade and needs to be address through identifying mutual business need among involved departments and supporting people with training ...". Regarding the technological capacity of LGA\_NW, all of the interviewees were concerned about the children's privacy, as an example the PTL clarified that "... after partially implementing the integrated system, we found out that existing

approach to information security, information assurance and privacy is inconsistent which constrains further restrict access to those parts of the system where there is a specific business need ...”. Regarding the EIS category, the PM stated that “... the analyses of cost/benefit came out with pleasing results including saving of between £150k and £300k in a year on expenditure, reducing the average journey from 14 miles to 12 miles, etc. which push forward the whole project ...”. Furthermore, the interviewees clarified that redesigning the current business process in the department involved in the project is inevitable as the PM clarified “... the council obtained workflow software for business process management as well as web content management in order to undertake business process redesign effort to be able to utilise the integrated system efficiently ...”. On the other hand, the influence of other LGA across the country that have started the EIS initiative which might influence the decision of LGA\_NW officials to progress the project received the least attention of the interviewees.

		Factors	HICT	ISM	PTL	PM
EE		Political Pressure (PP)	●	●	⊙	⊙
		Economic Pressure (EP)	●	●	●	●
		Legislation and Policy Principals (L&P)	⊙	●	●	⊙
		Community Pressure (CP)	⊙	⊙	●	●
CO		Inter-Organisational Leadership (IOL)	●	○	⊙	⊙
		Return on Investment (ROI)	⊙	●	●	●
		Network Collaboration Culture (CC)	●	●	●	●
		Organisational Size (OS)	○	○	⊙	⊙
TE		IT Capability (ITC)	●	●	⊙	⊙
		Data Security and Privacy (DS&P)	●	●	●	●
		Information Quality (IQ)	⊙	⊙	⊙	⊙
		Technical Interoperability (TI)	●	●	⊙	⊙
EIS		Cost of EIS (CEIS)	●	●	●	●
		Benefit of EIS (BEIS)	●	●	○	○
		Risk of EIS (REIS)	●	⊙	●	●
IDE		Business Process Compatibility (BPC)	●	⊙	⊙	●
		Inter-departmental Trust (IDT)	●	●	●	●
		Critical Mass (CM)	○	○	⊙	○

Table 1. Justifying Factors Influencing EIS

## 7.2 Testing Research Proposition B: EIS Participation Life-cycle

The interviewees were asked to comment and exemplify the importance of the aforesaid phases in which they went through prior to participating in the EIS project. Initially, all the interviewees agreed that these phases are quite vital to make the final decision on information sharing effort. For instance, the HICT clarified that “...we are talking about sharing sensitive information, so everyone is very cautious as the risk is fairly high. Therefore a perfect break down of different stages is inevitable ...”. The PTL believed that the incentive of the project triggered directly by the central government since the “Every Child Matter” goal was defined by the Department of Education to protect children from harm and neglect. The HICT, on the other hand, reported that “... the proposal phase wouldn’t influence the decision of departments on whether or not to share information as in the previous phase (Conception) all the plan of actions are defined by the senior councillors and there is an obligation for department to participate. This has caused immense resistances by department involved in the project as they believe the plan does not match with their resources and current business processes ...”. The importance of each phase is illustrated in Table 2.

Participation Phases	HICT	ISM	PTL	PM
Incentive	●	⊙	●	●
Conception	●	⊙	●	●
Proposal	○	⊙	○	⊙
Participation Decision	⊙	⊙	●	●
Sustainability	●	●	●	●

Table 2. Importance of Participation Phases

### 7.3 Testing Research Proposition C: Mapping Factors on Participation Phases

Before starting the mapping of factors on the participation phases, the interview went through a short presentation on how to perform the mapping. The interviewees were asked to map the factors influencing EIS on different phase of participation phases. Due to the restriction on the length of the paper, Table 3 just demonstrates the results of the mapping of factors on the *Incentive Phases*. The results highlight varied findings from the mapping of factors on each participation phases. It may be as the result of different understanding and observation of each interviewee during the pilot project.

		Incentive Phase			
		Factors	HICT	ISM	PTL
EE	PP	✓	-	✓	✓
	EP	✓	✓	✓	-
	L&P	✓	-	✓	✓
	CP	-	-	✓	✓
CO	IOL	-	-	✓	✓
	ROI	✓	-	✓	✓
	CC	✓	✓	✓	✓
	OS	-	-	-	✓
TE	ITC	✓	✓	✓	-
	DS&P	-	✓	✓	✓
	IQ	-	-	-	-
	TI	✓	-	-	-
EIS	CEIS	✓	✓	-	✓
	BEIS	✓	✓	-	✓
	REIS	✓	✓	✓	✓
IDE	BPC	-	-	-	-
	IDT	✓	✓	✓	-
	CM	-	✓	-	✓

Table 3: Mapping Factors on Incentive Phase

### 7.4 Testing Research Proposition D: Testing the Importance of EIS Factors

None of the previous sections are able to illustrate the importance of each factor on the EIS participation phases. This section, by employing the AHP technique, prioritises the importance of factors influencing EIS. AHP allows decision-makers to express their individual preferences. Therefore, EIS factors may be prioritised using the set of decision-makers' preferences to get a score and this can provide an EIS factors ranking for each decision-maker. This technique encompasses four basic steps: decomposition (*i.e. constructing the hierarchy model*), comparative judgments (*i.e. pairwise comparison*), and synthesis of priorities (*i.e. determining normalised priority weights and analysing and calculating the priority weights*). Table 4 illustrates the importance of each factor in their specified category only on the incentive phase as an instance. The weights are calculated by aggregating the values of each factor and dividing the results by the number of interviewees. The results demonstrated in this table do not justify that any of the factor is unimportant, but show the interviewees' perception on the importance of factors on different phases.

## 8 Revision of the Conceptual Framework

Based on testing research proposition A, two of the factors (*i.e.*, Organisational Size, and Critical Mass) were acknowledged as the least important factors influencing EIS in LGA\_NW. After analysing the empirical data and also some follow-up discussions with the initial interviewees, the reasons why these two factors were not validated in LGA\_NW can be concluded as: (a) the departments in LGA\_NW do not become aware of any project carried out in other departments as the inter-departmental communication is enormously poor, so they cannot learn about each other's successes and failures, (b) not all departments within LGA\_NW are required to have access to citizens' personal information, so the size of the entire LGA would not influence the decision on inter-departmental EIS.

Other factors have directly or indirectly influenced the decision-making process for sharing information electronically in inter-departmental collaboration. Moreover, seven factors were recognised as new factors including *Critical Events* and *Competitive Pressure* within the external environment category, *Institutional Charter and Priorities*, and *Delineation of Authorities* within the organisational environment category, *Data Ownership* and *Physical Location of Data Repositories* within the technology environment category, and *Process Controller* within the inter-departmental environment category. Based on testing research proposition B, most of the interviewees claimed that prior to final decision on sharing information, they might have two more stages including *Research Phases* prior to the proposal phase, and *Transparency and Accountability Safeguarding Phases* prior to the participation phase. These findings illustrate that prior to inter-departmental EIS in local level, identifying (a) influential factors, (b) participation phases, (c) mapping the factors on each phases of participation, and (d) prioritising the importance of factors on each participation phase would be vital to deeply understand the phenomenon.

		Priority Weights				Global Weight
Factors		HICT	ISM	PTL	PM	
EE	PP	0.5270	0.5003	0.1334	0.4256	0.3966 (1)
	EP	0.2913	0.2834	0.3514	0.4506	0.3442 (2)
	L&P	0.3462	0.1354	0.3483	0.1014	0.2328 (3)
	CP	0.1096	0.0805	0.1941	0.1376	0.1304 (4)
CO	IOL	0.2016	0.2291	0.3270	0.7002	0.3644 (2)
	ROI	0.1505	0.1574	0.3194	0.2967	0.2310 (3)
	CC	0.5872	0.5358	0.4498	0.4789	0.5129 (1)
	OS	0.2010	0.0774	0.0621	0.1216	0.1155 (4)
TE	ITC	0.3694	0.2203	0.3469	0.3628	0.3248 (2)
	DS&P	0.3098	0.4007	0.3367	0.3166	0.3409 (1)
	IQ	0.2339	0.2284	0.1775	0.1701	0.2024 (3)
	TI	0.1891	0.1503	0.1386	0.1578	0.1589 (4)
EIS	CEIS	0.1666	0.1796	0.2351	0.2243	0.2007 (3)
	BEIS	0.1666	0.1029	0.4402	0.1560	0.2164 (2)
	REIS	0.6666	0.6231	0.9735	0.6195	0.7206 (1)
IDE	BPC	0.3430	0.2720	0.5321	0.2720	0.3547 (2)
	ITT	0.5750	0.6079	0.3660	0.6079	0.5392 (1)
	CM	0.6319	0.1199	0.2892	0.1199	0.2902 (3)

Table 4: Importance of the Factors on the Incentive Phase

## 9 Conclusion

This paper empirically studied the importance of factors influencing the decision of LGA departments on whether or not to share sensitive information. The empirical findings from our study of the Home-to-School project provide evidence that successful inter-departmental collaboration at the local level is tremendously difficult. Although the integrated applications are piloted to assist information sharing efforts within LGA\_NW, the information is still shared manually through signed consent forms as the officials are concerned over the environment surrounding the EIS effort such as citizens' privacy and safety, inter-departmental trust, network culture, etc. Moreover the situation can be due to poor existing "policies and protocols" to offer appropriate cross-departmental information sharing electronically. Unsuitable legal provision for sharing sensitive information of endangered individuals with complex social needs is resulted in poor information management that present certain level of vagueness in inter-departmental collaboration. In this paper the authors proposed a novel conceptual framework which can be used as a tool to assist LGA departments on their decision to participate in an EIS effort. We intend to continue researching on inter- and intra-departmental EIS at a local level with the intention of identifying best practices which can be translated into longstanding collaboration.

## 10 References

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