



**Inter-departmental Information Sharing in Local
Government Authorities (LGAs): The Case of the
United Kingdom**

Thesis submitted for the degree of Doctor of Philosophy

by

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In His hands is every cause

هر کار با خداست

Abstract

This thesis focuses on investigating inter-departmental Electronic Information Sharing (EIS) through Inter-organisational Systems (IOS) in the context of Local Government Authorities (LGAs) in England and Wales. There is an increasing demand to involve LGA departments in sharing information electronically in order to reduce the cost of storing and managing data, increase the level of data accuracy and timeliness and improve the accountability of the authority. During the last decades, several LGAs in the United Kingdom have started to employ IOSs 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 and education services. However, reaching a great level of cross-departmental collaboration is not easy and requires additional time and effort.

Normative literature proposed various models and frameworks that examine various issues and factors influencing the effort of EIS in the private and public domain. However, the applicability and validity of those models in the context of LGAs is arguable. Therefore, this research 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 in LGAs based on external environment, organisational capacity, technology environment, EIS characteristics and inter-departmental environment, (b) investigation and presentation of the phases that departments adopt while participating in the EIS effort, (c) mapping of the influential factors onto the participation phases and (d) prioritisation of the factors influencing EIS in LGAs in relation to different phases.

By validating the conceptual framework through using a qualitative, interpretive, multiple case study research strategy, this thesis attempts to contribute to the theoretical, methodological and practical aspects of inter-departmental EIS. Despite the results of the cases cannot be generalised, yet they can allow others to relate their views with the ones reported in this thesis.

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List of Publications

Some of the materials presented in this thesis, have already been published or still under the review process:

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- (2012) Panagiotopoulos, P., **Bigdeli, A.Z.**, and Sams, S., Social Media in Emergency Communications: How Local Authorities used Twitter during 2011 Riots in England, *Government Information Quarterly (GIQ)*.
- (2012) Kamal, M, **Bigdeli, A.Z.**, Individual, Decision and Organisational Context Determinants Influencing Decision Makers while Adopting Integration Technologies, *Information and Organisation*[*Under Preparation*]

<i>Conference Paper</i>	<i>Published</i>
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- **Bigdeli, A.Z.**, Kamal, M.M., and de Cesare, S. (2012) Electronic Information Sharing in Local Government: The Decision Making Process. *Proceedings of the 20th European Conference on Information Systems - ECIS'12*, Barcelona, Spain.
- **Bigdeli, A.Z.**, Kamal, M.M., and de Cesare, S. (2012) Information Sharing in Inter-departmental Collaboration: A Conceptual Framework for Local Government Authorities. *Proceedings of the 6th International Conference on Theory and Practice of Electronic Governance, ICEGov2012*, New York, United State.
- Panagiotopoulos, P., **Bigdeli, A.Z.**, and Sams, S., (2012) 5 Days in August – How London Local Authorities Used Twitter during the 2011 Riots, The 4th IFIP 8.5 International Conference on eGovernment (eGov), Norway. [*Outstanding Paper Award for the Most Innovative Research Contribution/Case Study*]
- Kamal, M., **Bigdeli, A.Z.**, (2012) Shared Services: Lessons From Private Sector for Public Sector Domain, The 4th IFIP 8.5 International Conference on eGovernment (eGov), Norway.

- **Bigdeli, A.Z.**, Kamal, M.M., and de Cesare, S. (2011). Interorganisational Electronic Information Sharing in Local G2G Settings: A Socio-Technical Issue. *Proceedings of the 19th European Conference on Information Systems - ECIS'11*, Helsinki, Finland.
- **Bigdeli, A.Z.** (2011) Conceptual Model For Participation in Inter-Organisational Electronic Information Sharing (IEIS) in E-Government Environment, PhD Colloquium, IFIP e-Government Conference, Delft, The Netherlands
- **Bigdeli, A.Z.** (2011) To Share or Not to Share: Conceptual Framework for Electronic Information Sharing in Local Authorities, *Information Management and Knowledge Sharing (IMKS) Forum*, Kingston University, London, July 2011.

Book Chapter

Published

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- **Bigdeli, A.Z.**, de Cesare, S. (2011) Barriers to e-Government Service Delivery in Developing Countries: The Case of Iran. In: Carugati, A. and Rossignoli, C. eds. *Emerging Themes in Information Systems and Organisational Studies*: Springer, 307-320

Chapter 1 – Introduction

1.1 Background to the Research Area

Information is a key and strategic business asset and fundamental to the 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, are faced with difficulties in order to deliver services in an effective and efficient way. Those studies have now recognised that in order to overcome these difficulties, it is essential to transform their administrative processes (Fountain and Osorio, 2001) and establish effective inter-departmental Electronic Information Sharing (EIS) within and among LGAs (internally among departments and externally with other authorities).

Previous research has made distinction between three main contexts (Akbulut *et al.*, 2009): (a) intra-organisational information sharing, which the intention of individuals to share information has been analysed, (b) inter-organisational information sharing, which focuses on sharing information among two or more organisations and (c) inter-agency/department information sharing, which focuses on sharing information within the organisation and across its departments. This research focuses on the last category (i.e. inter-departmental information sharing) in the context of local authority where one or two departments within one authority should share information to deliver a specific public service.

Despite a decade of active research and practice in this complex area, the field lacks a comprehensive framework to identify and examine the factors that influence EIS among government bodies at the local level. The normative research has well investigated and analysed several factors influencing participation in EIS at a central/national level (e.g. Gil-Garcia *et al.*, 2010; Akbulut *et al.*, 2009; Gil-Garcia *et al.*, 2007; Lee and Rao, 2007; Pardo *et al.*, 2007). However, research investigating EIS participation at a local level is limited. This may be due to the complex organisational and technological structures of local authorities. Therefore, further research is required to support decision-making processes in LGAs in relation to participation in EIS with other departments within a single authority.

The significance of this research becomes manifest when considering decisions regarding the sharing of sensitive personal information (e.g., racial or ethnic origin, political opinions,

religious or other similar beliefs, membership of trade unions). It is not possible to take a generic view of information sharing. Information sharing itself is neither bad nor good; in some cases sharing information can lead to a disaster; in other situations disaster could be caused by failure of information sharing. The considerable political pressure to share information at a local level can be attributed to a series of well publicised tragic cases (Bellamy, 2008) including the death of Victoria Climbié as a result of long-term abuse by her guardians in 2000 (Cooper, 2005) and the sexual abuse of a nine-year-old girl by an offender who was on a sex offenders' treatment programme at the time of the attacks in 2006 (BBC, 2006). These cases are just a few examples that illustrate how failure of sharing information among different departments effectively led to disastrous outcomes. Constant misuses and losses of sensitive information in the public sector, especially at a local level, shows the weakness of these organisations in managing *when*, with *whom*, *what* and *how* information should be shared.

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-departmental distrust, is to blame for inappropriate decisions taken with regards to the sharing of information (Thomas and Walport, 2008). Sometimes implicit policies and regulations set by policymakers are blamed, while at other times, explicit rules of confidentiality and data protection acts are accused.

Relevant literature indicates that information sharing among governmental agencies has the ability to enhance the productivity and performances of government operations, improve policy-making and provide improved services to citizens. Hence, during the last decades, several LGAs have started to employ IOSs to support information sharing and networked collaboration (Fedorowicz *et al.*, 2007) within their departments. The main objective is to meet a diverse range of citizen needs including housing services, social care services and education services (Johnson and King, 2005). However, reaching this level of cross-departmental collaboration is not easy and requires additional time and effort by the individual and parties involved (Lips *et al.*, 2009). When the issues being dealt with are complex and multi-causal, no one department has adequate information and resources to address the issue unaccompanied (Conklin, 2006).

One of the main barriers is that in each department of a LGA, the operations are handled through employing different information systems and business processes with different architectural planning. Beynon-Davies and Williams (2003) argue that there is not enough willingness in LGAs to change their business processes and re-engineer their service delivery applications. The reason is that these processes have been designed and developed over several years and civil servants are reluctant to change these operational processes (Lam, 2005). Another reason may be as the result of a major concern for LGA officials regarding the investment decision related to business process re-engineering (Signore *et al.*, 2005). Wagner & Antonucci (2004) claimed that governmental agencies have very complicated budgeting and allocation processes. They argued that LGA budgets are frequently reduced and occasionally allocated inappropriately. In addition, when several departments within a local authority deal with citizens' personal information through inter-organisational systems, privacy concerns arise. Privacy is a multifaceted and ambiguous notion which has different meanings for different people (Nissenbaum, 2009). Signore *et al.*, (2005) argued that citizens' concern on the privacy and confidentiality of personal data is a key obstacle to implementing any information sharing and application integration project in the public sector. Lack of clarity in the privacy policies within LGAs has been identified as a significant problem in inter-departmental collaboration (Bellamy, 2008; Bellamy *et al.*, 2005; Lam, 2005).

As a result, several questions remain unanswered; (a) why is data being collected, (b) how will it be used and securely shared, (c) with whom will it be shared and (d) when should it be shared (Bellamy *et al.*, 2005). The absence of such policies presents a crucial challenge for policy-makers, regulators and service managers in order to establish an effective inter-departmental information sharing.

Several studies indicate the differences between the decision-making processes in local government authorities and other public or private organisations (Ward and Mitchell, 2004; Rocheleau and Wu, 2002; Bretschneider, 1990). Local government agencies 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). They are formed and structured by the rules and policies set by the Central Government. Ward and Mitchell (2004) stated that local agencies, compared to other organisations, have more legal and formal restrictions which decrease the managerial ability to make decisions over a range of organisational operations and processes. Moreover, Lam (2005) found empirical evidence

that LGAs seek help and guidance from Central Government in order to make the service delivery regulations align with their resources and capabilities. This evidence illustrates how LGAs have a significant bureaucratic structure and cannot perform as a self-governing organisation compared to a private organisation. 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 or not to share information with other departments especially when it comes to personal information; and to clarify the circumstances when frontline staff become more confident about navigating successfully between policy pressures to share more personal data and protect confidentiality.

1.2 Information Relationship between Citizens and Public Sector

Typically citizens use different forms of personal “identifier” such as name, address and date of birth to present themselves while they are communicating with the public sector (Lips *et al.*, 2009). Additionally, personal information is used for the purpose of identification in service delivery processes in the public sector (Lips *et al.*, 2009; OECD 2009).

Marx (2004) described an integrated view on different types of personal information and called it “Identity Knowledge”. As depicted in Figure 1-1, Marx attempts to visualise the relationship between different types of personal information.

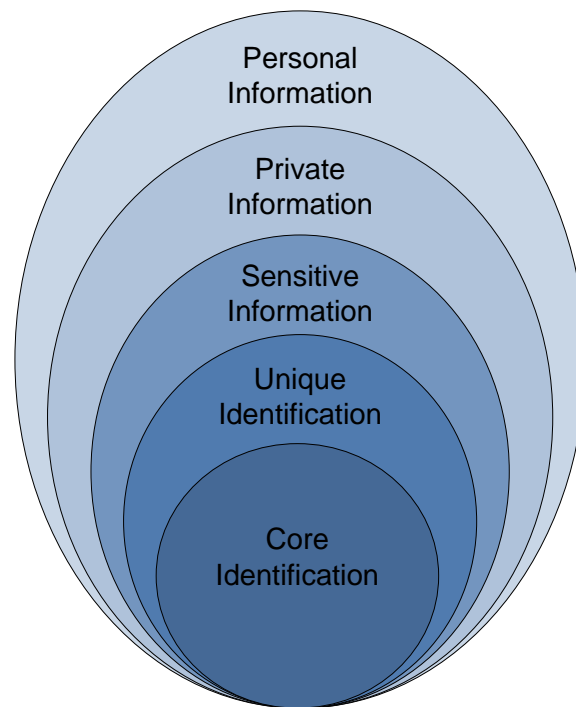


Figure 1-1: Model of Identity Knowledge

The outer layer is “individual or personal information” which consists of any data or information which can be attached to an individual. In this sense, the individual does not need to know all the information assigned to him/her. The next circle is “private information” which is not automatically available for others and only revealed under compelled disclosure enforced by law. “Sensitive information” is the information which selectively will be released by the individual to those who they trust or are close to. The unique and core identifications are those data that create a unique identity for an individual and often are based on biological ancestry.

When it comes to the notion of government service delivery and information sharing among various departments in local governments, focus should be on sharing “personal” and “sensitive” information. As these two terms mean different things to different people, it is indeed important to have an in depth understanding of them. Furthermore, it is important to clarify the proportion of the population who is concerned about how the government holds and shares their personal and sensitive information.

The Data Protection Act 1998 (Data Protection Act, 1998) which is a United Kingdom Act of Parliament defines U.K. law on the processing of data on identifiable living people. Under this act, Personal Information is stated as:

“Any information that relates to a living individual in which the individual can be identified – (a) directly from the information or, (b) from the combination of this information with other information that may be readily accessible (e.g. address but not name) and (c) which affects the privacy of the subject, whether in personal, family, business or professional life.”

Findings of a UK-based survey conducted by the British Computer Society (BCS) on citizen perception over information sharing among different departments in government show that the participants nominate the following types of information as “personal information”; financial information, health information, name and date of birth, banking and credit card details and tax records (Georgiou, 2008). Out of a representative sample of 1,025 adults aged 16 or over who were interviewed in England, Wales and Scotland, 47% were not happy for this information to be shared while 42% were happy for some of the information to be shared and 9% were happy for all information to be shared.

What is considered as sensitive personal information varies according to the context of the relationships; information relevant in the context of one relationship may not be appropriate in another (Lips *et al.*, 2011; Nissenbaum, 2009). The Data Protection Act 1998 goes further in depth by defining Sensitive Personal Information as:

“ Personal data consisting of information as to (a) the racial or ethnic origin of the data subject, (b) his political opinions, (c) his religious beliefs or other beliefs of a similar nature, (d) whether he is a member of a trade union, (e) his physical or mental health or condition, (f) his/her sexual life, (g) the commission or alleged commission by him of any offence, or (h) any proceedings for any offence committed or alleged to have been committed by him, the disposal of such proceedings or the sentence of any court in such proceedings.”

In 2008 the Institute for Insight in the Public Services (IIPS) led research regarding UK citizens' attitudes toward data sharing in the public sector through interviewing 1,011 adults aged over 16 (Nash, 2008). More than 65% of the respondents said “Yes – Happy” when they were asked about personal information such as date of birth, educational qualification and national insurance number to be shared across departments. On the other hand, about 60% answered “No – Not Happy” when the questions narrowed down to sensitive personal information such as details of criminal records, medical and health records and membership

of a union.

These figures prove that there is a large variation in the level of citizen acceptance of information sharing in governmental departments, mainly dependent on the type(s) of information being requested and also on the department requesting it. Therefore, convincing citizens and raising awareness among them should be considered as significant issues regarding the sharing of information in the public sector.

1.3 Importance and Implications of Information Sharing in LGAs

Increasingly, in many countries around the world, establishing inter-organisational systems to enable EIS and enhance the quality of service delivery towards citizens, especially those at risk including children, elderly people, homeless, refugees and others with special and complex needs, is core to public management reforms (Lips *et al.*, 2009; Varney, 2006). A successful approach to sharing and managing citizen information in an electronic manner is expected to bring a wide range of benefits to government agencies such as increasing efficiency in business processes, improving effectiveness of service delivery, experiencing inter-departmental joined-up services, improving accessibility to the public services, enhance accountability among agencies, improving personal and public protection and particularly, building trust among the agencies (Akbulut *et al.*, 2009; Lips *et al.*, 2009; Fedorowicz *et al.*, 2007).

The new wave of inter-departmental collaboration in the public sector in which electronic information sharing is one of its indispensable results may not just bring a variety of benefits to the government, but it also leads to significant reforms in the relationship between citizens and government (Bellamy, 2008; 6 *et al.*, 2005). Improvements in technological capability and resources in public sector which have led to digitalise personal information sharing may bring considerable informational changes to governmental back-office relationships. Some of the major reforms have been suggested by various academics (Lips *et al.*, 2011; Akbulut *et al.*, 2009; Lips *et al.*, 2009; Bellamy, 2008; Marx, 2004) such as:

- Traceability of citizen information becomes more transparent compared to paper-based information sharing.
- Data exchange among different corporate systems becomes more convenient.
- Transactional histories become more accountable and easily available to the relevant

department(s).

- Trust will be dependent on the transactional history rather than on personal recognition.

In the context of local government authorities, the occurrence of these reforms would enhance the capability of LGAs in order to capitalise their initiatives such as electronic service delivery and efficiently interact with their citizens and other stakeholders on a consistent basis (Kamal and Alsudairi, 2009). As governments around the world become more citizen-centric rather than organisational-centric, improving inter-departmental collaboration and information sharing becomes vital and therefore Information and Communication Technologies (ICTs) become a critical infrastructure of 21st joint-up government (Gil-Garcia *et al.*, 2010; Gil-Garcia *et al.*, 2009). However, the introduction and use of ICTs may have varying impacts on the way that personal and sensitive information are held, managed and shared within the public sector, ranging from enhanced level of information security to increased risks of information breaches (Lips *et al.*, 2009).

Countries such as United Kingdom, Canada and Australia have now developed different strategies and regulations (e.g., UK Data Protection Act 1998) in order to reduce the tension between the goal of service transformation and privacy of citizens. Though, based on an independent review on Data Sharing in the UK's public sector, published by the Ministry of Justice, the researchers came to the conclusion that in many cases the regulations themselves do not act as a barrier to information sharing across different agencies, but in the vast majority of cases it leaves those who may wish to share specific information in a fog of confusion (Thomas and Walport, 2008). As yet, based on an extensive review of the relevant literature, participation in inter-departmental EIS has not widely been investigated in LGAs; hence research on it remains limited. Reasons for this include: (a) confusion over the ownership of personal information in LGAs, (b) the organisational structure in local governments does not allow effective electronic information sharing and (c) lack of awareness about the benefits of electronic information sharing.

There is scarce research in which the state of information integration and sharing is examined in a specific context. For example, Sharon Dawes in 1996 identified and discussed the benefits and barriers facing information integration in inter-agency collaboration in Central Government in the United States. She proposed a theoretical model of inter-agency information sharing based on the result of 173 interviews with Central Government

managers in the State of New York (Dawes, 1996). Another example is the work by Landsbergen and Wolken (2001). The researchers expanded Dawes' model by interviewing Federal and State officials in five US states.

Although the above studies provide some understanding regarding information sharing in the LGAs, they have failed to identify issues and factors that can be seen as influential in LGAs (Bigdeli *et al.*, 2011). As a result, LGAs seek answers for the impact of EIS in inter-departmental collaboration as the effort does have a direct contribution on their service delivery. Therefore, incentives and motivations for conducting this research can be summarised as follows:

- 1- Previous research has been conducted when Information and Communication Technologies (ICTs) were not as advanced and developed as they are today.
- 2- Previous research has not extensively examined the EIS participation phases that departments adopt in determining whether to share information with other departments.
- 3- Previous research has not prioritised the factors influencing the EIS effort based on their importance.
- 4- Previous research has not differentiated between electronic and non-electronic information sharing. This issue is fairly important as the expected barriers, benefits and risks differ in electronic and non-electronic information sharing.
- 5- Previous research has focused on either technological or political and organisational aspects of information sharing in public organisations rather than have a holistic socio-technical perspective.
- 6- Previous research has analysed the experiences and viewpoints of those government agencies who were pioneers in using technology and complex systems, rather than those agencies which may have not had sufficient resources and capabilities.
- 7- Previous research has used mainly central/federal/state level organisations as empirical cases and not the organisations from the local governmental level.

1.4 Research Aim and Objectives

The research presented in this thesis is based on two key facts; first the failure of IOS adoption in LGA department and second, the complex decision and business processes together with the lack of common IT infrastructure in LGAs that have resulted in deprived Electronic Information Sharing (EIS) among different departments (Kamal and Alsudairi,

2009; Klievink and Janssen, 2008; Beaumaster, 2002). Therefore this initiative (EIS) should be examined; hence the main aim of this research is to

“Propose a conceptual framework that may assist the local government authorities departments in their decision making process for electronic information sharing.”

In order to achieve the aim of this research the researcher should first empirically examine the extent to which and how personal information associated with complex and multiple needs of citizens is gathered, stored and shared across different departments in a LGA. Secondly, the “necessity” of a socio-technical framework of relevant factors influencing the departments participation in EIS will be highlighted.

Although several factors are documented in the normative literature, there is a need to analyse and explain them in the context of local governments. This framework would support LGA officials in their decision-making processes regarding participation in EIS. Moreover, this research attempts to: (a) identify the phases of EIS participation, (b) the factors that would influence the decision of participation at each phase and (c) prioritise the importance of participation factors in relation to participation phases. Therefore, the objectives of this thesis can be summarised as follows:

Objective 1 – Provide a concise review of the notion of inter-departmental information sharing in LGAs, as well as the way they implement and adopt IOS to share information in an electronic fashion.

Objective 2 – Critically investigate and examine the factors that influence the effort of EIS in the context of inter-departmental collaboration in LGAs.

Objective 3 – Critically investigate and examine the phases that departments adopt while participating in the EIS effort in LGAs.

Objective 4 – Demonstrate the importance of the influential factors in relation to participation phases that can support the overall decision-making process for EIS in LGAs.

Objective 5 – Develop and present a conceptual framework for EIS participation in LGAs that holistically addresses previous objectives.

Objective 6 – Test and evaluate the proposed conceptual framework through analysing

empirical data gathered from several case studies in the context of UK LGAs.

Objective 7 –Provide a novel contribution to the domain of local authority, as well as develop implications for theory and practice and future research directions.

1.5 Research Question

Based on the above discussion and the identified gap in the literature, this research focuses on the following question:

What factors influence the decision-making process in Inter-departmental Electronic Information Sharing (EIS) in Local Government Authorities (LGAs) in the United Kingdom? What are the phases that each department may adopt prior and while sharing information? Which of the factor(s) would be considered the most and the least influential factor(s) in each of the phases?

In order to answer these questions from a socio-technical perspective, it is critical to examine technological phenomena within the contexts in which they are embedded. Consequently, this study investigates the contextual effects of environmental, organisational, business processes and technological conditions, which may influence the decisions of the departments to participate in EIS. An interpretive, case study approach is employed in order to investigate and analyse the factors that influence LGA's participation in inter-departmental collaboration. The reason for selecting this approach is that the researcher seeks 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, but it must be observed in its totality (Klein and Myers, 1999).

1.6 Research Outline

The structure of this study consists of four main elements as defined by Phillips and Pugh (2000): (1) background theory; (2) focal theory; (3) data theory and (4) novel contribution. Background theory refers to identifying the research area which has been discussed in Chapter 1, as well as discussing the identified problem/background in depth (see Chapter 2). The second element, which would be discussed in Chapter 3 deals with generating and proposing a conceptual framework. Data theory will be presented in Chapter 4 which describes the most suitable epistemological stance along with appropriate research methodologies. Also, this element deals with the data collection analysis processes; the

latter presented in Chapters 5 and 6. The implications of the research, lessons learnt and suggestions for future studies will be discussed in Chapter 7. Figure 1-2 illustrates and summarises the research outline.

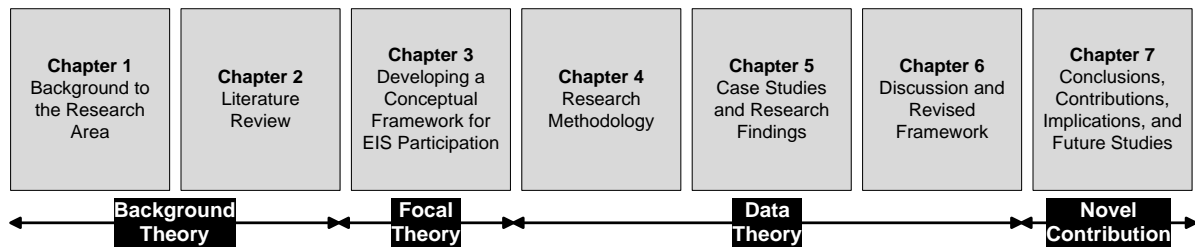


Figure 1-2 Research Outline

- **Chapter 1 – Introduction to the Research Area**

This Chapter provides an introduction to the research issues addressed in this thesis by focusing on Electronic Information Sharing (EIS) in Local Government Authorities (LGAs). This is followed by a discussion of why participation in EIS is vital in inter-departmental collaboration along with the impacts and implications. Research aims, objectives and the main questions have also been defined.

- **Chapter 2 – Literature Review**

Giving an introduction to the research area, Chapter 2 focuses on providing an overview of previous literature and models related to EIS, as well as current trends in information sharing in LGAs. This Chapter also discusses the four main contexts surrounding the effort of EIS in the public sector including Policy and Social Environment, Inter-organisational Settings, Organisational and Business Process Settings and Technology Solution. These are followed by discussion about theories related to the adoption of EIS initiatives in Local Authorities and selection of the most suitable theoretical lens to examine this initiative in LGAs.

- **Chapter 3 – Developing a Conceptual Framework for EIS Participation**

This Chapter focuses on developing and proposing a conceptual framework that can be used as a tool for decision-making towards inter-organisational systems adoption that enables LGAs to share information in an electronic manner. The framework consists of four main levels: (a) investigating and presenting factors infusing EIS in LGAs based on external environment, organisational capacity, technology environment, EIS

characteristics and inter-departmental environment, (b) investigating and presenting the processes that each LGA department typically experiences when making decisions about sharing information with other departments, (c) mapping the influential factors on to the decision-making phases and (d) prioritising the factors influencing EIS in LGAs in relation to different participation phases.

- **Chapter 4 – Research Methodology**

Following the research background presented in Chapter 2 and the conceptual framework presented in Chapter 3, this Chapter presents the research approach adopted in this study to achieve the research aim and objectives. It provides an overview of IS research followed by a review of three major research paradigms. This will be followed by the reasons for selecting interpretive research as the research approach. Thereafter, the following section explains why qualitative research is used in this research and further explains the benefits and limitations of qualitative research. An overview of each case and justification of why these cases have been chosen will be presented subsequently. The last section focuses on empirical research design, data collection methods and data analysis.

- **Chapter 5 – Case Studies and Research Findings**

This Chapter focuses on the analysis of the proposed conceptual framework (Figure 3-6) for Electronic Information Sharing (EIS) in inter-departmental collaboration in Local Government Authorities (LGAs). Three case studies of local authorities in England and Wales will be presented and examined. The reason why this research was not extended to the entire United Kingdom is that the structure of local authorities in Scotland and Northern Ireland is fundamentally different from the rest of the country. Therefore, in the selected region three in-depth case studies have been conducted.

- **Chapter 6 – Discussion on the EIS Framework**

While the previous Chapter presented and analysed the findings of the three selected case studies, the main objectives of this Chapter are to: (a) analyse how each of the proposed factors has influenced the EIS decision-making processes, (b) discuss the rank of each factor in relation to participation phases and (c) determine the extent to which the

departments' decisions on sharing information have altered the capacity of LGAs in terms of IOS adoption. Through these discussions, it will be appropriate to revise the conceptual framework presented in Chapter 3, adding new influential factors and participation phases identified from the 12 interviews.

- **Chapter7 – Conclusion, Contributions, Limitations and Future Research**

The last two Chapters presented and discussed the empirical findings of the three case studies. This Chapter concludes the findings of the research presented in this thesis and explains the contributions based on three main areas: contribution to the theory, contribution to research methodology and contribution to practice. Based on the empirical findings, it will be discussed how Diffusion of Innovation (DOI) theory and Technology-Organisation-Environment (TOE) framework should be transformed to be applicable for analysing innovation adoption of an inter-organisational initiative. This Chapter furthermore presents some recommendations in regards to the improvement of EIS in LGAs. It will thereafter highlight the limitations of conducting this research and propose that these limitations should be considered when interpreting the results. This will be followed by proposing some directions for the future studies.

Chapter 2 – Literature Review

2.1 Introduction

The enormous usage of Information and Communication Technologies has altered different aspects of life; how people live, how businesses run and how governments interact with their customers. Recently, the adoption and development of these technologies in private sectors has put massive pressure on the public sector to keep up. Government organisations discover that it is essential to transform their administrative processes in order to improve the efficiency and effectiveness of interacting with their customers. One such transformation is the use of ICT to facilitate government information sharing in a networked environment. The ability to share information within governmental departments is vital to transform the organisational structure and communication channels between and among different agencies in order to provide services towards customers in an efficient manner.

Electronic Information Sharing (EIS) within government boundaries requires fundamental technical and organisational changes. Therefore, to have effective and sustainable information sharing, governmental organisations should overcome a range of problems and challenges. From a technical point of view, information system designers and developer are faced with a variety of challenges related to the existence of different platforms, diverse data structures and incompatible network infrastructure. From an organisational perspective, enabling information sharing requires new work processes leading to considerable change in the organisational structure and culture. Identifying these challenges is the first step of understanding the complexity and socio-technical nature of inter-departmental information sharing.

2.2 Information Sharing in the Public Sector

A number of academics have clarified that in order to gain the maximum benefits from ICT in government processes, organisations should integrate and share their information. Dawes (1996) simply defines information sharing as exchanging information within and across government agencies, or otherwise giving them access to information (Dawes, 1996). As Scholl and Klischewski (2007) stated information integration can be recognised as “the forming of a larger unit of organisational entities, temporary or permanent, for the purpose of merging processes and/or sharing information”. Therefore, information integration is a pre-

requisite of information sharing. As it can be observed from Figure 2-1, to have an efficient service delivery and in order to meet customer needs, building an integrated environment is vital. This integrated era consists of cooperation among different departments that share information within interoperated information systems across the government.

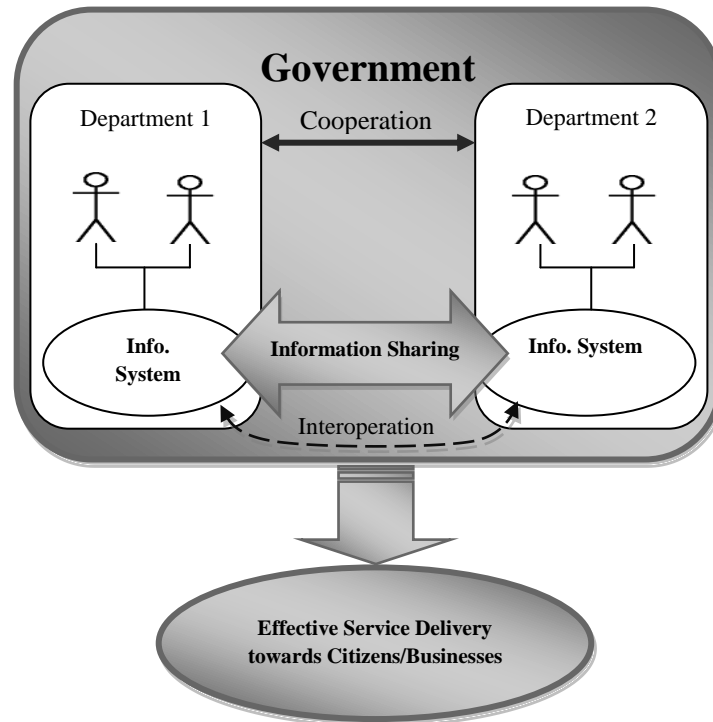


Figure2-1:Integrated Environment in Government, Adapted from (Scholl and Klischewski, 2007)

From a practical point of view, the notion of information integration and sharing in the public sector should be seen as a socio-technical phenomenon. Gil-Garcia et al (2009) clarified that inter-organisational information integration and sharing is a combination of both social and technical elements hence it is a very complicated field to study. They suggested four interconnected aspects ranging from social to technical which would help for a comprehensive understanding of the concept: (1) trusted social network, (2) shared knowledge and information, (3) integrated data and (4) interoperable technical infrastructure (Figure 2-2).

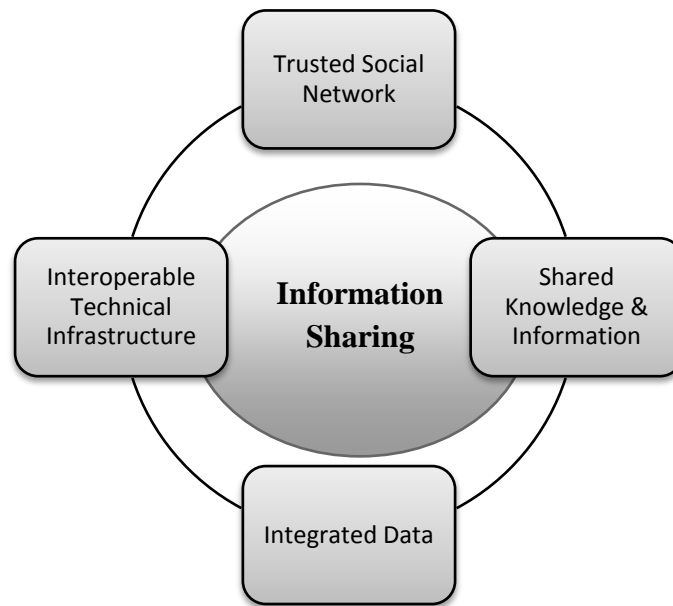


Figure2-2:Four Interconnected Concepts of Information Sharing in the Public Sector (Gil-Garcia *et al.*, 2009)

Trusted social network is the fundamental stage that refers to a set of collaborations between those actors who have trusted each other and are involved in inter-organisational information sharing. Shared information and knowledge refer to the of flow tacit and explicit knowledge in the form of formal documents, information relationships, messages and emails. Integrated data indicates the integration of data at different levels based on a standard among networked organisations. Lastly, interoperable technical infrastructure is clarified by different information systems which are able to communicate with each other and transfer information (Gil-Garcia *et al.*, 2009).

2.3 Benefits of Electronic Information Sharing in the Public Sector

Information integration as well as information sharing represents an opportunity for decision makers in government to make more informed decisions based on completed data gathered through cooperation across the organisations/departments. Benefits of information sharing in government could be identified through realising the purposes of digital government (Gottschalk and Solli-Saether, 2009). In this sense, the significant purposes are described as responsive, customer-centric, accountable, transparent, effective and efficient public operations and services (Scholl and Klischewski, 2007). Reaching these goals and purposes

requires integrating information resources and therefore, interoperation among information systems. By integrating and linking a variety of consistent information, citizens and businesses would be able to access several comprehensive online services offered by different public agencies and departments (Lallana, 2008).

From a government point of view, information sharing can bring a number of benefits to the administration processes (Landsbergen and Wolken, 2001). It allows governments to build an effective collaboration among different departments and sections. Therefore, government would be able to respond and solve more complex problems, thus improving service delivery and also provide new online services towards citizens and businesses. This effective collaboration would also increase the accountability and transparency of the government processes in which the administration is able to justify their plans and programmes and also notify citizens in an enhanced way. As a result, e-government interoperability is likely to lead to good governance.

These days data and information needed by policy makers to make better decisions and solve complicated problems are available but inaccessible. Overlapping and uncoordinated data sources, as well as the absence of common terms in representing the data are the main constraints for data accessibility. Interoperability allows data to be understandable by different agencies in order to make faster and better decisions.

These benefits are varied from one organisation to another one and also depend on the nature of the projects. However, there are certain benefits which are similar in almost any information integration and sharing project in the public sector and can be summarized into three main categories: organisational benefits, political benefits and technical benefits (Pardo *et al.*, 2007; Dawes, 1996).

- *Organisational benefits* are referred to the solutions leading to an increase in organisational capability through information integration and sharing. The business processes and decision-making would be improved, coordination among different agencies would be more efficient and therefore the quality of service enhanced.
- *Political benefits* include a better appreciation for government policy and goals, more government accountability, more transparency and more integrated planning. It may also include personal benefits for civil servants as the result of using a specific application.

- *Technical benefits* are related to the positive result of efficient data processing and information management. As an example, information integration and sharing can reduce the duplication of data collection, data processing and data storage which would reduce costs and improve data processing time (Drake *et al.*, 2004).

2.4 Challenges to Electronic Information Sharing in the Public Sector

Similarly to many IT/IS related initiatives, information integration and sharing poses difficult organisational challenges. These challenges are a consequence of information integration and sharing involving many organisations with different backgrounds and dissimilar levels, e.g. local or state. Therefore, establishing such collaborations in order to deliver services to the end users is characterised by a myriad of obstacles.

Scholl and Klischewski (2007) identify a number of constraints that influence information sharing in the context of the public sector, which are discussed as follows:

- *Constitutional/legal constraints*: Usually administration power of a government is divided into separate levels and entities. The United State Constitution, for instance, separates the government into three levels of federal, state and local government levels and into legislative, judicial and executive divisions. Since these levels and entities have their own boundaries, rules and policies, information sharing and exchanging data among them become an extremely complex task.
- *Organisational constraints*: In many cases, government agencies and departments have their own business processes and resources. Therefore, achieving integration and interoperability becomes extremely complicated since there is no unique standard on processes, systems and policies (Klischewski, 2004; Scholl, 2005). So far, those government departments that align their organisational context with other departments, become enabled to increase the level of integration.
- *Informational constraints*: Transactional information is more readily shared, while the organisational and strategic information may not be. This barrier occurs as strategic information is classified for a specific entity of the government and it would be a complicated task to exchange and share it with others. Moreover, Dawes (1996) argues that information quality constraints arise as the data and information are provided by

different sources with different control and quality standards.

- *Managerial constraints:* Information integration and sharing require collaboration among several government organisations with different structure, attitude and culture. Therefore, managing and monitoring the processes of exchanging and sharing information represents a bottleneck for entire e-government processes.
- *Cost constraints:* As integration of information and processes across different government bodies and departments is costly, it is strongly dependent on the availability of funds. Moreover, unexpected budget constraints possibly affect the progress of long-term integration projects.
- *Technological/performance constraints:* Defining standards for information integration and sharing within the public sector is a complex task that requires specialised technical knowledge. Moreover, as the number of entities involved in information integration through interoperable systems rises, overall system performance in terms of response time will decrease. Therefore, those factors that bring efficiency to interoperable systems should be taken into consideration during the design and development phases.

2.5 Previous Research on Information Sharing

As it was discussed in Chapter 1, research on inter-departmental EIS in public sector is very limited. In general, previous research has focused on a combination of electronic and non-electronic information sharing and can be divided in three main contexts: (a) intra-organisational, (b) inter-organisational and (c) interagency/inter-department (Akbulut *et al.*, 2009).

In an intra-organisational context, prior research has mainly focused on analysing individuals' intention to share information/knowledge within an organisation. As an example, Bock *et al.* (2005) focused on behavioural factors that affect information and knowledge sharing. The researcher examined the social-psychological and organisational issues that shape an individual's decision on participation in information sharing efforts. In the inter-organisational context, the studies have acknowledged the importance of information sharing as a booster of networked collaboration in supply chains (e.g. Guo *et al.*, 2006; Kelle and

Akbulut, 2005).

In the interagency context, the researcher was able to identify only two major studies. The earliest research conducted at this level was a study by Sharon Dawes (1996). The first part of this study identifies and discusses the benefits and barriers that information sharing faces (discussed in sections 2.3 and 2.4). In the second part of the study, Dawes carried out a survey in the State of New York and analysed the attitude and thoughts of 173 government managers regarding the identified benefits and barriers of information integration and sharing. Around 80% of the State managers identified that information sharing among different agencies brings beneficial results. They stated (a) more integrated plans, (b) improvement in policy development and programme implementation across agencies, (c) improvement in data accuracy for decision-making and problem solving, (d) improvement in using the resources and (e) improvement in the networked collaboration among the agencies as the most important benefits.

Around 40% of participants clarified that they were concerned about the risk of adopting information sharing in their organisation. They believed that information integration and sharing may decrease the level of manager involvement in decision-making processes and also result in data misinterpretation across the agencies. Moreover, they stated that since information integration brings transparency to organisational processes, criticism by citizens and businesses is inevitable.

This study shows that successful information integration and sharing in public sectors relies on two main issues: (1) establishing a legal and formal framework such as interagency agreements and common legislation that can guide information integration and sharing activities in the authorities and (2) effective tools to ease the management of the shared public information such as information inventory, technical standards and common data definition. Based on the findings of the surveys, Dawes proposed a theoretical framework of interagency information sharing that is illustrated in Figure 2-3.

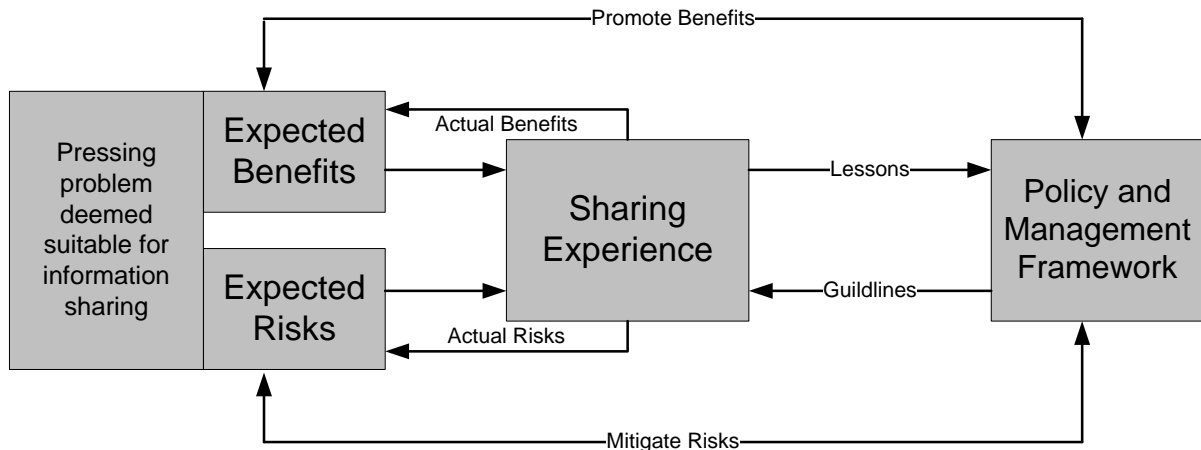


Figure 2-3: Theoretical Framework of Interagency Information Sharing (Dawes, 1996)

The model proposes that the main driver of interagency information sharing is the pressing problem that may be solved through information sharing among the organisation. It also shows that the agencies' decision on adopting information sharing is strongly directed by perceived risks and benefits, while the deployed policy and management frameworks are inevitable. Sharing experience, consequently, is generating the basis of actual benefits and risks and could be a lesson for future policy and management framework.

Dawes's model provides a foundation for understanding information sharing by highlighting that sharing experiences should be analysed to identify the actual benefits and risks. It also emphasises that a policy and management framework should be in place to promote the benefits and mitigate the risks. The framework, however, is limited in three areas. Firstly, the survey was conducted around 20 years ago when the information technologies were not as advanced and developed as they are at present. Therefore, it fails to consider and capture the technological factors that may facilitate interagency information sharing. Secondly, the model does not differentiate between electronic and non-electronic information sharing. This issue is fairly important as the expected benefits and risks differ in electronic and non-electronic information sharing. Moreover, the policy and management framework should be defined in a different way if the sharing process is electronic-based.

The second study was conducted by Landsbergen and Wolken (2001). The study mainly focused on electronic interagency information sharing, built upon the theoretical framework proposed by Dawes in 1996. The researchers reviewed a selection of prior studies on information systems interoperability, information resource management and networked collaboration in the public sector. They acknowledged the costs and benefits of adopting

interoperability in the public sector and proposed a list of barriers to inter-departmental information sharing efforts. The researchers selected two different case studies – one focusing on the Environment Reporting System and the other concentrating on Geographic Information Locator Service (GILS) – and interviewed Federal and State officials in five States, i.e. Kansas, Massachusetts, Ohio, Texas and Washington. Based on the analysis of the results, they proposed their extended model of interagency information sharing shown in Figure 2-4.

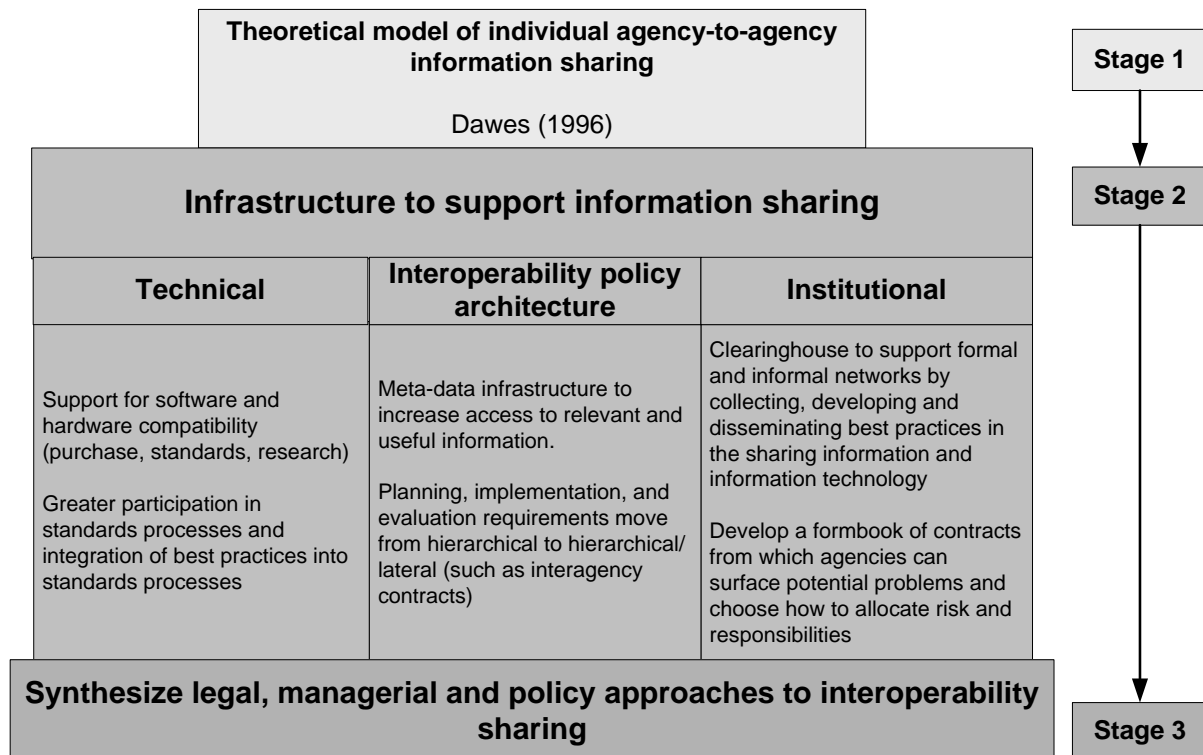


Figure 2-4: Extended Theoretical Model of Interagency Information Sharing (Landsbergen and Wolken, 2001)

Landsbergen and Wolken argued that, based on Dawes's study, government agencies participate in information sharing because they were motivated by a set of tangible benefits, as well as by strong political pressure. They criticised that these factors, i.e. tangible benefits and political pressure, cannot sufficiently be considered as drivers for sharing information. Regarding this statement, the researchers recommended that as well as developing harmonised managerial, legal and policy approaches, a technological infrastructure would be inevitable to support and facilitate information sharing. The main contribution of their model therefore is its emphasis on the need for a technological infrastructure along with legal, managerial and policy infrastructures to maintain and support inter-departmental information sharing via

electronic means.

Despite the extension, the model is limited in one significant respect. Landsbergen and Wolken focused on recognising the experiences and viewpoints of those government agencies which were pioneers in using technology and complex systems, rather than those agencies which may not be familiar with these initiatives. As a result, the findings of their study cannot be generalised to the government agencies at a local level and that are unfamiliar with EIS.

2.6 Current Research on Information Sharing

By and large, developing and implementing information technology in organisations cannot be viewed as a deterministic process that behaves in a well-ordered manner. It is because different stakeholders have different views and interpretations of a similar system, as well as the impacts of human and organisational factors, which may generate an unpredictable outcome. For example, Sahay and Robey (1996) explored how the implementation and adoption of a specific geographical information system in two very similar government agencies produced a very different outcome. They argued that social and organisational factors should be considered together with the technological capabilities and resources simultaneously.

Many information integration and sharing development projects fail to deliver the expected outcomes. A large percentage of these failures are the result of the social and organisational factors, rather than just technical issues. Conceivably, a significant problem facing systems developers is that the organisational impacts resulting from the implementation of an information system may be undesirable and unpredictable (Doherty and King, 2005). Since sophisticated and complex information systems can interact with the host organisation in very different ways, it would be difficult to predict all of their impacts. Clegg et al. (1997) noted that the lack of attention to human and organisational factors is a key reason of system failure in organisations manifesting itself in the form of poor project management, poor examination of user requirements and failure to involve key stakeholders.

Three noticeable points can be summarised from the information systems literature: the rate of failure in information systems development projects is disappointingly high; the main cause of such failure is the lack of attention to both organisational and technical factors

affecting the development processes and lastly, the progress of generating a socio-technical approach which explicitly addresses both technical and social aspects of system development is very low. Therefore, it can be argued that there is a need for developing a framework in order to identify and analyse both technical and social aspects of information system development such as information sharing and integration.

Although several studies have identified and analysed a variety of environmental, inter-organisational and intra-organisational factors affecting government information sharing, they do not present a comprehensive set of factors involved. They are mainly focused either on technical issues and factors involved in information sharing or managerial and organisational factors. Lee and Rao (2007), for instance, investigated and examined the factors affecting information sharing among anti/counter terrorism agencies. The research largely focused on information assurance of the entities involved in the information sharing processes, as well as technical standards available in the agencies' IT systems. The researchers clarified that information sharing acceptance is established through the availability of technical standards among different information systems used by different agencies, rather than organisational needs and capability.

On the other hand, Pardo *et al.*,(2006)put emphasis on organisational structure and capability influencing information sharing implementation in governmental inter-departmental collaboration. The researchers conducted a comparative study of two inter-departmental information sharing projects and found that the traditional management strategies are not sufficient enough to make the environment ready for a successful information sharing. The researchers revealed the importance and critical role of “trust” in building response capacity in cross-boundary information sharing.

In another study conducted in this area,Gil-Garcia *et al.*,(2007)clarified that successful collaborative e-government relies on sharing information as well as integrating business processes within the agencies. The study chiefly focused on social and organisational aspects of information sharing by gathering data from six public sectors involved in this initiative. The researchers argued that expected benefits are an important motivator for starting collaboration within the government agencies while the perceived impediment and prior experiences may affect this relationship in a negative way. Management directives were also recognised as a key enabler of adopting information sharing in governmental agencies as

they can decrease the level of risk, set clear goals and objectives and keep the user's expectation, especially the senior managers, genuine.

While the importance of considering both technical and organisational factors in any IT/IS project has now been acknowledged (e.g. Doherty and King, 2005), little progress has been made in order to develop a socio-technical framework so as to identify and analyse the range of factors from social to technical. One of the few examples is the survey conducted by the Centre of Technology in Government (CTG) at the State University of New York. The researchers viewed information sharing and integration as a combination of four different but interrelated contexts. The contexts are shown in Figure 2-5.

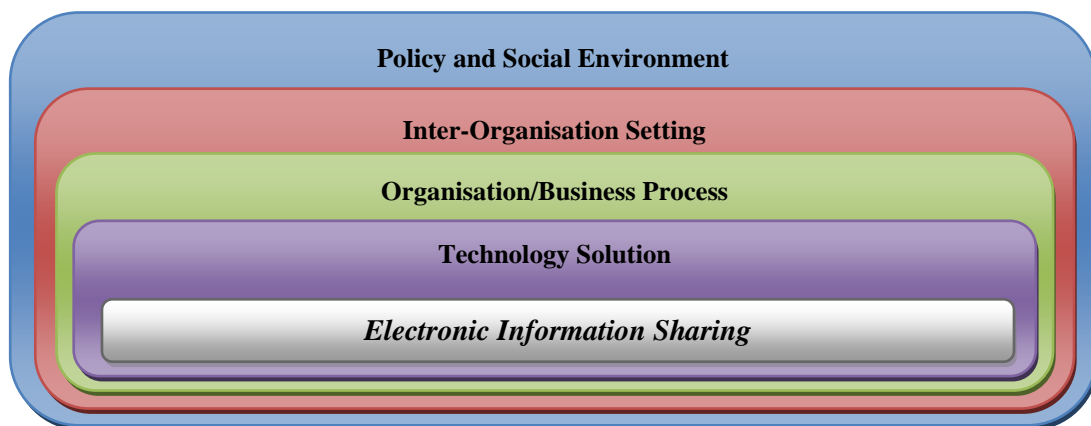


Figure 2-5: Contexts of Electronic Information Sharing (Pardo and Tayi, 2007)

This figure illustrates how information sharing relies on four main aspects. A specific technology solution is required for information sharing which is reliant on computer and information system science. This solution should be built based on consideration of intra-organisation interaction and processes such as business processes, decision-making processes and so on. Sequentially, since the departments need to collaborate and cooperate with other entities within the larger organisation, the intra-organisation issues are affected by elements of the larger multi-organisational settings such as leadership participation and trust. Also, at a macro level, the inter-organisational relationships are influenced by factors in their shared environment such as political and economic issues. Based on this discussion, we can recognise that information integration and sharing should be viewed as a multi-disciplinary notion (Pardo and Tayi, 2007).

However this approach has not been tested practically at a local government level, it

may assist the key stakeholders and IT developers to move away from traditional organisational structures and boundaries and consider all factors affecting inter-organisational information integration and sharing. Therefore, it would be positive to investigate these layers in depth.

- **Policy and Social Environment**

This layer refers to a regulatory framework which defines the scale, content and standards of electronic information sharing among governmental agencies based on formal policies and regulations. This includes those external factors which have strong institutional influences on inter-departmental information sharing such as legislation and policy concerns, as well as the economic and political situation (Pardo and Tayi, 2007). Since most governmental activities are identified and funded through formal legislations and policies, a consideration on bureaucratic and political factors is required (Pardo and Tayi, 2007). By and large, these legislations force the agencies to focus on their own activities rather than cross-boundary collaboration and cooperation. As Landsbergen and Woken (2001) stated, governmental agencies typically gather, process and store information regarding those activities in which they are involved while they are not aware of the circumstances in which they can share data and information with other agencies. Moreover, *political and economic* issues have been identified as two key environmental factors affecting any e-government development project (Heeks, 2006). This applies to any inter-organisational/inter-departmental information integration and sharing project as interdependent groups (e.g., senior public managers, politicians and IT developers) with different objectives, values and political backgrounds are involved in the same project. From an economic point of view, since the benefits of information sharing among different government agencies are still hidden and unclear, governments prefer to spend their budget on other IT-related projects. In addition, developing and implementing such projects is quite costly as it requires bringing together both tangible (people, money, equipment, etc.) and intangible (data and information) resources. In turn, governmental entities lose their willingness of carrying out these projects. Furthermore, *network externalities* would strongly affect the adoption of information sharing and integration within an organisation and they refer to “*the positive external consumption benefits as a result of a technology use*” (Lou *et al.*, 2000:94). This means a user of new technology will benefit more as the total number of users for the technology increases. Therefore, a

rise in users puts pressure on those organisations that have yet to adopt the technology. As inter-departmental information sharing requires two or more agencies to collaborate, network externalities should be recognised as a key issue to attract more agencies to participate in the notion

- **Inter-Organisational Setting**

The notion of sharing and integrating information within governmental organisations strongly depends on inter-organisational relationships and *network collaborations* (Pardo and Tayi, 2007). Formation of these networks has been identified as a complicated process as the goals and objectives are quite diverse among different departments. The entities involved may have different interests, expectations and goals (Navarrete *et al.*, 2010). This lack of shared *goals and objectives* within the government departments can be identified as a primary challenge to information integration and sharing projects, possibly leading to confusion and conflict among different roles and responsibilities. Therefore, the success of inter-organisational information sharing and integration is associated with clearly defined goals for each department. *Leadership* can be identified as another key factor concerning information sharing and integration (Faerman *et al.*, 2001; Gil-Garcia *et al.*, 2007; Zheng *et al.*, 2009). It refers to the task of managing the collaboration process. Leadership at all levels plays a significant role in order to define the rules and situation for the individuals involved. Four major tasks for managing and maintaining collaboration networks have been identified: activating, framing, mobilising and synthesising (Agranoff and McGuire, 2001). Activating refers to the identification of participants and stakeholders in the network. The process of framing involves defining the operating rules of the network. Mobilising encourages individuals to make an efficient commitment to the network. Finally, synthesising is the task of improving the condition for having a productive interaction and collaboration among the network. Leaders can use their power and reputation to legitimise ways to deal with and solve problems (*ibid*). Participation in inter-organisational information sharing is also strongly dependent on *trust* among different departments and entities (Pardo and Tayi, 2007; Gil-Garcia *et al.*, 2010). Anderson and Narus (1986) in (Neergaard and Ulhoi, 2006) define inter-organisational trust as “*a company’s belief that another company will perform actions that will result in positive outcomes, as well as not taking unexpected actions that would result in negative outcomes for the company*”. Building trust can be seen as a significant step in order to establish

successful inter-organisational information sharing. The result of empirical analyses by Zaheer *et al.*(1998) clarify that trust reduces negotiation cost and conflict and increases performance among different sections involved in information sharing. In addition, financial matters would certainly influence EIS participation in the public sector. On the one hand, the governmental agency may face some difficulties related to obtaining the *level of funding* they have requested and on the other hand, they should deal with the complexity of the funding allocation (Lam, 2005). Furthermore, financial capability is inevitable for procuring and developing adequate levels of hardware and software as well as for improving the level of IT knowledge among the employees (Kim and Bretschneider, 2004).

- **Organisation/Business Processes**

In general, information systems have strong influence on the *work process* of organisations as these systems embed the processes and information flows in complex software (Pardo and Tayi, 2007). Information sharing and integration involves mutually adjusting work processes of multiple organisations. It requires not only a technical transformation, but also change in *decision-making policies* and in the mind-set of the employees. Therefore, change in processes, functions and management mind-set, especially in the public sector, represents a key issue (Lam, 2005). However the development and adjustment of separate processes, information flows and workflows is an extremely complicated task, resulting in a significant reduction in overall integration cost as the integration time and maintenance would be reduced.

- **Technology Solution**

From a technology point of view, developing inter-organisational information integration and sharing is a complicated task as it involves complex systems composed of different software, hardware and telecommunication technologies. Participation in such projects requires a certain level of *IT infrastructure*, knowledge and capability among the involved organisation (Fan and Zhang, 2007). Moreover, accessing and sharing information from diverse sources such as different databases, text files and images would cause severe problems. Solving these technical problems typically involves developing of *data standards*, constructing systems of ontologies and designing interoperable applications to provide a structure for alignment of meaning across heterogeneous and unstructured

resources (Pardo and Tayi, 2007). Lack of interoperability standards and disparities in architecture are a noticeable concern among information sharing projects (Lam, 2005). Sharing and integrating large amounts of data with different forms, from different organisations with different geographical location and different technological platforms also poses numerous challenges regarding other technical factors such as *data quality*, *security*, accuracy, consistency and completeness. Perhaps, one of the most significant challenges for developing such a project is *application security*. It is vital not just for improving the work and information flow between different agencies and departments, but also for building confidence and trust among them.

Based on the above discussions, several specific gaps can be identified in the current literature:

- As it was mentioned earlier, previous studies on information sharing were conducted when the technological innovations were not as advanced as they are today. Hence, no differentiation between electronic information sharing and non-electronic ways of sharing information were made.
- Most of the proposed frameworks and models (e.g., Dawes's conceptual model) specifically focused on inter-departmental information sharing at the State Level. Although there are some similar issues regarding EIS between central and local governments, investigation that specifically focuses on EIS in local government agencies is essential. Local government agencies are not just the scaled-down version of Central Government as their human, financial and technological resources are not in the same level as the Central Governments. Therefore the factors which affect participation in EIS among local government agencies should be investigated.
- Largely, studies that have been conducted in the area of information sharing in public sectors mainly focus either on the technological or social aspects of the initiative. As discussed in section 2.6, many IT projects fail in the public sector as the result of human and organisational issues rather than just technological ones. Therefore, there is a need for further investigation that focuses on a combination of Social and Technical (Socio-Technical) factors influencing local agency participation in EIS initiatives.

- Previous research mainly focused on recognising the experiences and viewpoints of those government agencies who were pioneers in using technology and complex systems, rather than those organisations (e.g., LGAs) which may have not had sufficient resources and capabilities.

2.7 Adopting EIS Initiative in LGAs: Theoretical Foundation

Inter-organisational Systems (IOSs) are the main enabler of EIS in a collaborative environment. Kumar and Van Dissel (1996) stated that most IOSs are developed and implemented to facilitate inter-departmental collaboration and to manage information sharing within and across the organisation. Robey et al. (2008) conducted empirical research on the theoretical foundations regarding IOSs adoption. They examined 104 papers published in 11 leading IS journals between 1990 and 2003. The researchers found that more than half of the selected articles had no underlying theory and were mainly based on frameworks, critical success factors, practices and description of the business value of IOSs. On the other hand, the theory-based empirical studies used 17 specific theories such as institutional theory, transaction cost theory and diffusion of innovation, which highlights a high degree of diversity. Therefore, it is vital to have an explicit classification of different types of theories of IOS adoption.

In order to identify the most suitable theory for this research, the taxonomy of Markus and Robey (1988) that focuses on the “structure of theory”, that is, researchers’ conceptions of the nature and direction of causality was used. This causal structure of the theoretical models comprehensively covers three principal dimensions illustrated in Figure 2-6; Causal Agency, Logical Structure and Level of Analysis.

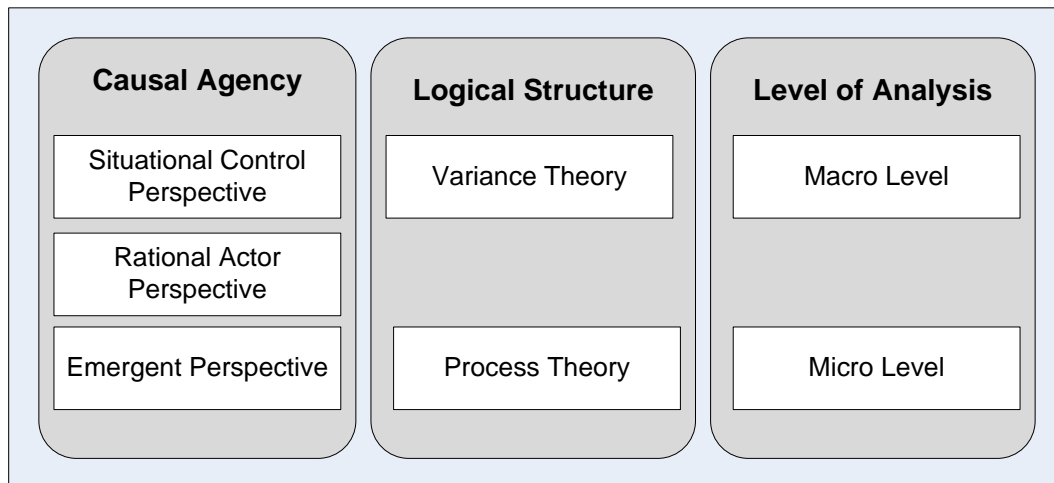


Figure 2-6: Dimensions of Causal Structure (Source: Markus and Robey, 1988)

Causal agency refers to the beliefs about the nature of causality, the identity of the causal agent and the nature of action. There are three perspectives related to this dimension:

- *Situational Control Perspective*: the essence of this perspective is conveyed by the word ‘impact’ (Markus and Robey, 1988:585). Based on this view, external pressures constrain or force organisations to behave in certain ways. It assumes that the characteristics of technology and potential adopters regulate the actions in terms of the use and consequences of adoption. Pfeffer (1982) states that the action is seen not as the result of conscious choices, but as the result of external pressure, demands and forces that the organisations may have no control over.
- *Rational Actor Perspective*: Whereas the previous perspective assumes that information technology controls human and organisational behaviour, the rational actor perspective assumes almost unlimited choice over technological options and unlimited control over the consequences of technology adoption. Pfeffer (1982) argued that “*behaviours are chosen, that such choices occur according to a set of consistent preferences, which choices occur prior to the action itself and that action is goal directed*”, (p.6).
- *Emergent Perspective*: This perspective asserts that adoption of any technology emerges from complex social integrations and cannot be predicted either by the intention of the actors or by conditions of the environment alone. In this regard, Pfeffer (1982) stated that “*because participation in organisation decisions is both segmented and discontinuous, because preferences develop and change over time and because the interpretation of the*

results of actions is often problematic; behaviour cannot be predicted a priori either by the intention of individual actors or by the condition of the environment”,(p.9).

The second dimension, logical structure, refers to the time span of the theory, the logical formulation of the theoretical argument and the hypothesised relationships between predicting variables and outcome(s). Regarding this dimension, Mohr (1982) distinguished between the variance and process theories. He explains the similarities and differences between these two types of theories, illustrated in Table 2-1, in terms of the hypothesised relationship between logical antecedents and outcomes.

In the *Variance Theories* the predicting variables at a given and specific time are the necessary and sufficient condition for the outcome. For example, in a variance theory that investigates use of IT/IS as a cause of organisation centralisation, centralisation is expected to occur whenever IT/IS is used. *Process Theories*, on the other hand, assert that the outcome(s) are only partially predictable from the predicting variables. According to these theories, the outcome(s) are determined by dynamic relationships between technology and potential adopters over time. A good example of a process theory is the “garbage-can” theory of organisational choice (Cohen *et al.*, 1972). In this model, organisation’s decision-making is resulted from collisions of participants, choice opportunities, solutions and decisions. Markus and Robey (1988) stated that most of the diffusion of innovation theories are process theories, at least implicitly.

	Variance Theories	Process Theories
Role of Time	Static	Longitudinal
Definition	The cause is necessary and sufficient for the outcome(s)	Causation consists of necessary conditions in sequence
Assumptions	Outcome will definitely occur when necessary conditions are present	Outcome(s) may not occur (even when the conditions are present)
Logical Forms	If X, then Y; if more X, then more Y	If not X, not Y

Table 2-1:Variance Theories vs. Process Theories

Referring to the Table 2-1, variance theories differ from process theories in their assumptions about the relationship between antecedents and outcomes. Variance theories postulate an invariant link between the causes and effects when the contingent conditions obtain. Whereas, process theories emphasise that the outcome can happen only under these conditions, but may also fail to happen. Moreover, in terms of the logical forms of these two theories, they differ in conceptualisation of outcomes and antecedents. For example, with a variance theory perspective, if the use of IT/IS is necessary and sufficient for organisation centralisation, then increased use of IT/IS should lead to greater centralisation. In process theories, however, this cannot be extended.

The third dimension, level of analysis, refers to the type of social entities that are the main concern of the study (Kurnia and Johnston, 2000). This dimension can be categorised as a *macro-level* analysis when the research is dealing with large-scale collectives (e.g., organisations and societies), or a *micro-level* when dealing with small groups such as small firms. Regarding this, Markus and Robey (1988) argue that mixing levels of analysis may be useful in research and theory in information technology and organisational change, since most of the technological innovations are neither strictly micro nor macro in character.

Most of the previous studies concerning the adoption of IOSs in either the private sector (e.g. Premkumar and Ramamurthy, 1995; Pavlou, 2002; Chwelos *et al.*, 2001) or the public sector (e.g. Rukanova *et al.*, 2009; Pardo and Tayi, 2007; Neergaard and Ulhoi, 2006) have used approaches, which according to the classification of Markus and Robey are micro-level, situational control and variance theory. These studies rely primarily upon either Roger's (2003) theory of Diffusion of Innovation (DOI) on its own, or together with the Tornatzky and Fleischer's (1990) Technology – Organisation – Environment (TOE) Framework. Several academics (e.g. Baker, 2011; Robey *et al.*, 2008; Fichman, 2004) consider these two theories to be the dominant paradigm in innovation studies. Kurnia and Johnston (2000) refer to these theories as the factor approach. They clarify that this approach assumes that a number of predicting variables also known as “factors” identified at a particular time influence actions regarding the adoption of innovation. Based on DOI or TOE, the proposed factors can be classified into three typical groups: the nature of technology, the capability of the adopting organisation and aspects of external environment. The unit of analysis would be the individual adopters. Under this approach, adoption at the broader level of organisation is explained mainly by critical-mass effects (Bouchard, 1993). A typical model with the factor

approach explaining the adoption of technological innovation is illustrated in Figure 2-7.

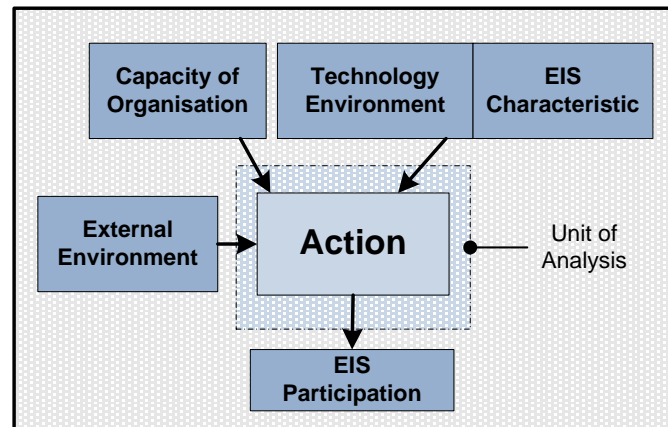


Figure2-7:Typical Adoption Model with Factor Approach

Applying such a strategy to study IOS adoption has several positive features (Kurnia and Johnston, 2000). Firstly, generalisable research methods such as survey can be used and the relationship among the variables can be statistically tested. Moreover, the results do not require complex interpretation by academics and they can be readily translated into sets of guidelines. On the other hand, a factor approach limits the number of variables that can be investigated and also may fail to capture the complex inter-organisational settings that occur during the adoption of IOS (Tornatzky and Fleischer, 1990).

Several studies, mainly in the private sector domain, (e.g. Pan and Jang, 2008a; Kuan and Chau, 2001; Iacovou *et al.*, 1995) have applied the factor approach to study the adoption of IOS. By applying this approach, the implicit assumption is that the organisations are “passive victims” of the technology, their own limited capability and their external environment (Kurnia and Johnston, 2000). Therefore, it can be argued that this approach is well suited when dealing with small adopters as they are more passive than large enterprise in the adoption of technologies. As the DOI explains, their actions are usually determined by the nature of technologies, their internal capabilities and external pressure from other large firms.

Neither the factor approach nor the rational actor approach can provide a comprehensive model of IOS adoption while dealing with public sector organisation especially LGAs. They are neither totally victims of their environment nor in total control of their environment. They have quite complex organisational structures and basic service delivery systems based on their resources and their customers’ needs (Senyucel, 2005). LGA service delivery and

administration processes have been traditionally based on a decentralised bureaucratic framework. This means each department can be seen as a separate administration with different objectives, resources and capabilities. As a result of this bureaucratic structure and the fact that local government administrators and employees do not have an in-depth knowledge and experience of information technology, IT implementation and adoption become a slippery slope (Beaumaster, 2002). There is, also, a constant pressure from Central Government, the public and the press on LGAs to make use of a wider range of information technologies to be able to enhance operational efficiency and effectiveness.

Beaumaster (2002) argues that LGAs suffer from what may be termed as “*IT lag time*”. This means there is a large gap between the adoption of new technologies (i.e., IOS and EIS) and their acceptance and reutilisation across the entire organisation. Therefore, regarding the adoption of innovation, local government agencies are categorised as the late majority groups or “laggards” (Themistocleous *et al.*, 2004). Rogers (1995) indicates that laggards are those who adopt new technology when it is necessary and there is no other choice. Among the laggards, the decision on whether to use and adopt new technology or not is fairly time consuming as their social and technological resources are very limited. Moreover, innovation adoption in LGAs intensely relies on the interaction among departments, third party IT providers and other governmental bodies. Hence, in this situation, the inter-departmental environment has to be taken into account.

Furthermore, the adoption of IOS in LGAs should be seen as a process where inter- and intra-organisational interactions play a significant role. With this perspective, the LGAs’ capability to adopt a technology and indeed the nature of technology itself can be changed over time. Therefore, in order to study the adoption of IOS more comprehensively in the context of local authorities, the unit of analysis has to be spanned beyond the departmental level and the time scale requires to be extended beyond a single epoch (Dawson, 1994). This necessitates a number of changes to underlying theories of IOS adoption; from situational control to emergent causality, from a variance to a process logical structure and from a micro level to a micro/macro level analysis. As Kurnia and Johnston (2000) stated, this kind of view can be referred as “processual”. Figure 2-8 illustrates the conceptual changes leading from the factor approach (Figure 2-7) to the processual approach when the inter-departmental environment is considered in IOS adoption.

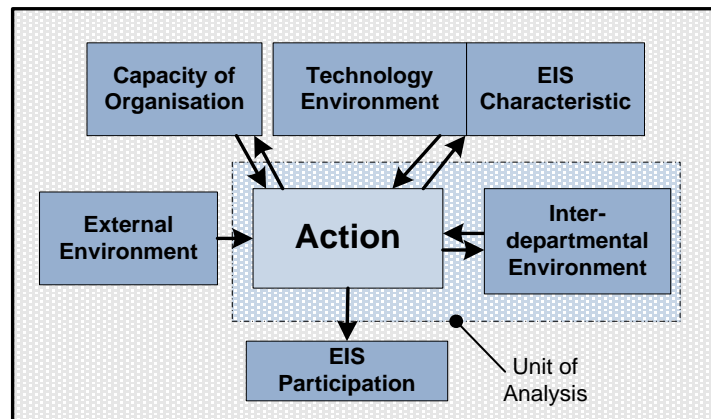


Figure2-8:The Processual Adoption Model

Having examined the significance of IOS adoption in organisations, *social exchange theory* (Emerson, 1976) and *critical mass theory* (Bouchard, 1993) can also provide essential foundation of identifying some of the factors that influence inter-departmental EIS. Therefore, in the following sub-sections, these two theories will be briefly described.

2.7.1 Social Exchange Theory

According to social exchange theory, in an inter-departmental relationship, the outcome of a participant's behaviour is based upon the responsive behaviour of other participants within the relationship (Son *et al.*, 1999). As Premkumar and Ramamurthy (1995) stated "*social exchange theory provides the foundation for the study of relationships between organisations*", p. 306). This theory has been initially used by IS researchers as a foundation to investigate and examine the factors influencing the inter-organisational relationship from a non-economic perspective (ibid). Humphreys *et al.*, (2001) argued that social exchange theory forms a theoretical background in order to study and examine non-profit inter-organisational transactions. Based on this argument, this theory can be applied when the relationship and collaboration among different entities need not necessarily result in any economic outcome. The factors derived from this theory such as power, trust, interdependency and conflict have been examined in different empirical studies to analyse different aspects of inter-organisational relationship and collaboration (Son *et al.*, 1999).

In the context of inter-departmental information sharing, Akbulut *et al.*, (2009) argue that "*Trust*" and "*Power*" can be considered as two important social factors that play significant roles in the decision-making process of participation in EIS. Inter-departmental trust can be defined as "*a company's belief that another company [department] will perform actions that*

will result in positive outcomes, as well as not taking unexpected actions that would result in negative outcomes for the company” (Anderson and Narus, 1986: 522). Research suggests that inter-departmental trust can provide positive expectation and confidence to the other side of the relationship in order to determine the effectiveness of the departmental network and achieve common goals (Gil-Garcia *et al.*, 2010). The empirical analyses of the result of the study conducted by Zaheer *et al.*, (1998) shows that there is a difference between interpersonal trust and inter-departmental trust in which inter-departmental trust reduces negotiation cost and conflicts and improves performance in networked collaboration whereas inter-personal trust cannot provide such significant effects.

Another key factor that influences any kind of IOS is “power”. It can be defined as “*the capability of a firm to exert influence on another firm to act in a prescribed manner*” (Hart and Saunders, 1997: 24). It can be assumed that the powerful side of the relationship can strongly influence the less-powerful side based on its own needs (Saunders and Clark, 1992). The role of power in inter-departmental relationships has been studied in relation to the interdependency among organisations. Dependency between different departments in a networked collaboration environment should be maintained in order to achieve a common goal and objective (Ganesan, 1994). However, Saunders and Clark (1992) argue that most of the literature does not indicate to what extent power can influence inter-organisational relationships and they stated that: “*if an organisation would have taken a certain activity anyway, power was not the cause for the action’s occurrence*” p.10.

2.7.2 Critical Mass Theory

Another perspective that can be useful to describe the adoption of a new technological innovation is the “Critical Mass Theory” (Bouchard, 1993). This theory observes the adoption of those innovations which require collaboration among the participants. It has been argued that the organisation’s participation decision depends on the number of organisations that have already been involved and/or will have a plan to get involved soon (Hall and Khan, 2003; Bouchard, 1993). Similarly Kuan and Chau (2001) stated that the final decision of an organisation to adopt any new innovation may not be influenced by the innovation itself, but would be affected by the number of partners and competitors who already adopted it.

Critical mass theory also results in the creation of positive network externalities that refer to “*the positive external consumption benefits as a result of a technology use*” (Lou *et al.*, 2000:

94). This means the user of a new technology may benefit more as the total number of users for the technology increases. Lou *et al.*, (2000) argued that the existence of network externalities has two important effects on technology adoption; first, as the number of adopters of a new technology increase, potential users would find the technology more attractive and second, current users act as an influential motivator for non-adopters to start using the technology. Therefore, as inter-departmental EIS involves two or more departments to collaborate, network externalities should be recognised as a key issue to attract more contributors to participate in the notion.

2.8 Conclusion

This Chapter reviewed relevant literature in order to identify the research issue(s) in the context of local government authorities (LGAs). It started by the description of information sharing and integration in LGAs, followed by the benefits and challenges facing local authorities to participate in such effort. Through presenting previous studies on information sharing in the public sector, a gap in the literature regarding the absence of a theoretical framework to examine the effort of EIS participation at a local level was presented and discussed.

Although the existing frameworks scrutinise information sharing in the public sector, the validity and applicability of them on local government authorities are doubtful. Firstly, those frameworks mainly focus on inter-organisational relationship in Central/Federal level and secondly, they examine either the technological or social aspects of the EIS initiative rather than looking at it comprehensively. The structure of local authorities is far more complex than private organisations and even other public organisations at the central level. They are influenced by Central Government and other governmental bodies and the adoption of any information system initiative involves distributed decision-making based on a division of control and powers. Therefore, the EIS effort in the context of LGAs should be analysed exclusively.

In the last subsection (Section 2.7), it was argued that information sharing can be seen as an innovation within LGAs as it enables re-engineering of business processes and work flows. The review of IT adoption in LGAs reveals that while LGAs have adopted several IT systems to improve their operations, many problems still exist, such as limitation in LGAs' IT infrastructure and limitation in IT knowledge among LGAs' staff. Furthermore, it

was proposed that since participation in inter-departmental information sharing requires mutual collaboration among several departments based on trust and power of participating agencies, *critical mass theory* and *social exchange theory* can provide a theoretical foundation for the conceptual framework applied to examine the initiative.

Based on previous studies and relevant theories presented in this Chapter, the conceptual framework of participation in inter-departmental EIS in LGAs will be proposed in the next Chapter.

Chapter 3 – Developing a Conceptual Framework

3.1 Introduction

The previous Chapter discussed some research issues regarding information sharing in the public sector in general and in local governments specifically. These issues underlined that: (1) a conceptual framework that holistically examines EIS in local government is very limited, (2) several essential drawbacks can be acknowledged in the existing frameworks as they mainly focus on either organisational and policy aspects or the technological side of information sharing, (3) previous research focused on information sharing in Federal/Central Governments, (4) existing frameworks do not map the influential factors to different stages of decision-making and (5) existing frameworks do not prioritise the influential factors based on their importance in relation to the stages of the decision-making process. Therefore, to further investigate these issues, the researcher attempts to develop a socio-technical framework for EIS in LGAs.

In this Chapter four main approaches will be followed prior to proposing the conceptual framework for EIS participation in LGAs. Firstly, factors that influence the decision-making of an LGA department on whether or not to participate in information sharing will be identified. In doing so, an adapted form of Kurnia and Johnston's (2000) framework on inter-organisational collaboration will be used as the basis of this research. This framework has been developed based on the dimensions of causal structure by Markus and Robey (1988) reported in Section 2.7. The factors, thereafter, will be grouped based on five main categories: (a) External Environment, (b) Organisational Capacity, (c) Technology Environment, (d) EIS Characteristics and (e) Inter-departmental Environment.

Following the in-depth descriptions of the factors in each group, the phases that departments adopt while participating in the EIS effort will be identified and examined. It will be discussed that information sharing through IOS in the context of local authority can be considered as an innovation; hence, its adoption involves a sequence of stages that a department goes through prior to and while sharing information electronically. Furthermore, prioritisation of factors in relation to the participation phases based on their importance will be discussed.

3.2 Investigating Factors Influencing EIS in Local Government Authorities

Decision-making about adopting Inter-Organisational Systems (IOS) that facilitates inter-departmental information sharing has become central to researchers and practitioners in the field of Information Systems (Pardo and Tayi, 2007; Neergaard and Ulhoi, 2006; Nagy, 2004). In recent years, several studies have identified and analysed a variety of environmental, inter-organisational and intra-organisational factors that affect governmental information sharing. It can be argued that such factors are country – sector specific and are not applicable to other sectors. Therefore, as LGAs have a unique organisational structure compared to other sectors, such as the private sector (Ward and Mitchell, 2004) or even compared to Central/Federal government (Senyucel, 2005), it could be clarified that additional factors may be indispensable to be identified for LGAs.

Kurnia and Johnston (2000) clarify that any adapted framework needs to be developed and refined to match the context it is applied to within a certain period of time. As mentioned earlier, most of the previous studies on EIS follow a factor approach, which their authors assumed that the outcomes of technology adoption are determined by a number of variables known as factors identified at a particular time (Rukanova *et al.*, 2009). Such studies focus mainly on individual organisations to be applied as the unit of analysis. They are, as a result, unable to capture and analyse (a) the context and dynamic interaction among different departments and (b) the on-going process of adoption.

So far, EIS has not been widely investigated in LGAs. To the best of the researcher's knowledge, the procedural framework on 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., Ali *et al.*, 2009; Kamal & Alsudairi 2009). Therefore, the main reason for selecting this framework as the basis of this 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 (Figure 3-1) 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.

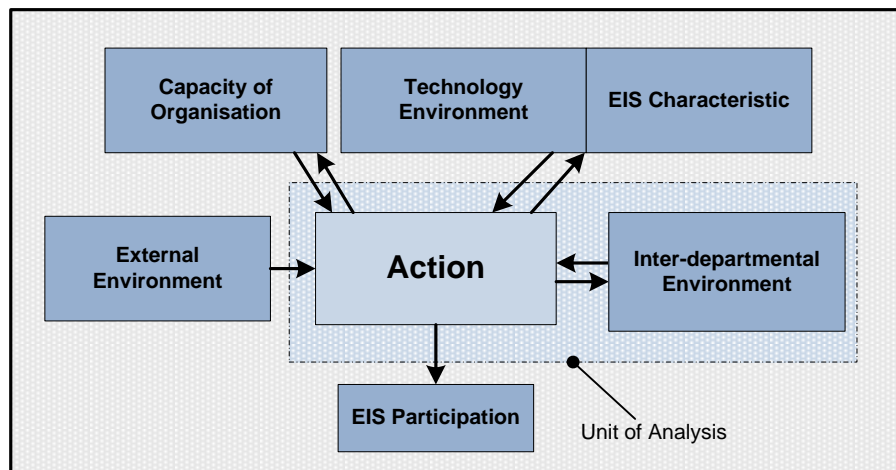


Figure3-1:Conceptual Framework of IOS Adoption – adapted from (Kurnia and Johnston, 2000)

By having a socio-technical perspective, which theorises that technological phenomena should be investigated and analysed within the context in which they are embedded (Orlikowski and Iacono, 2001), the author will identify the factors in each factor group by investigating literature on innovation adoption in the public sector, information sharing in governmental settings, inter-organisational systems adoption, inter-departmental collaboration and Enterprise Application Integration (EAI).

3.2.1 Investigating External Environment Influencing EIS

Information sharing among LGA departments is directly affected by the external environment in which the authority operates (Akbulut *et al.*, 2009; Ryan *et al.*, 2008; Pardo and Tayi, 2007; Bryson *et al.*, 2006). 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. Based on normative literature on information sharing in the public sector, the external factor group is divided into four key categories that will be discussed in depth: (a) Political Pressure, (b) Economic Pressures, (c) Legalisation and Policy Principles and (d) Community Pressures.

Political Pressure: Political pressure refers to the influences of Central Government on decision-making processes of local authorities. This pressure also influences the collaborative network, as well as the design, implementation and adoption of inter-organisational systems (Fedorowicz *et al.*, 2007), hence, strong institutional effects on information sharing in LGAs

(Pardo and Tayi, 2007). Since most of the government activities are defined and funded by the Central Government, consideration on bureaucratic and political factors is essential. Landsbergen & Woken (2001) stated that departments at the local level typically gather, process and store information regarding their operational activities. However they are not aware of the circumstances when they can share that information with other departments. In recent years, Central Governments in developed countries attempted to promote information sharing in local government authorities by developing a variety of national guidance notes as well as information sharing protocols (Bellamy, 2008; 6 *et al.*, 2005). As an example, the Cabinet Office in the United Kingdom has published a White Paper in 2005, which indicates that the Central Government placed the enhancement of information sharing within LGAs at the core of e-government projects. Furthermore, a committee was formed to develop the strategy of information sharing in public sectors (CabinetOffice, 2005b). Therefore, political influences range from guidelines and recommendation plans to constitutional and mandatory strategies that can act as a barrier to or an enabler of EIS within LGAs. The above discussions provide sufficient reasons for considering *Political Pressure* as an influential factor for EIS participation in LGAs.

Economic Pressures: Economic pressures refer to the Central Government's economic conditions including level of employment, recession and inflation that may influence inter-department collaborations at a local level (Fedorowicz *et al.*, 2007; Weiss, 1987). Economic settings, similarly to the political environment, can either take an encouraging or obstructing role. The budgets allocated to ICT-related projects in LGAs are much lower compared to private or even other public sector organisations (Ward and Mitchell, 2004). As Lam (2005) clarified, government organisations face difficulties in obtaining the level of funding they request. Therefore they are forced to invest on other important initiatives rather than investing on technology-related projects. Moreover, several countries especially in Europe are now faced with budget deficits whereby they must reduce their costs and levels of spending. In the United Kingdom, as an example, the Central Government tries to reduce the operational costs by encouraging local agencies to establish network collaborations among different departments to be able to share their services, processes and information. Moreover, as the Central Government sets out plans for a significant acceleration in the reduction of budget deficit (HMTREASURY, 2010), LGAs' budgets has are reduced by more than 7% a year in real terms, which is the biggest budget cuts in the entire public sector in

decades.(LocalGovernmentGroup, 2010). As a result, local councils are under enormous pressure to double their efforts and focus more on efficient ways of service delivery towards citizens. Thus, based on the above discussions, *Economic Pressure* has been regarded as a factor that may influence EIS in LGAs.

Legislation and Policy Principles: The legal principles refer to the information sharing policies that, in theory, should create an environment in which sharing information among departments become effective and legitimate (Dawes, 1996). Landsbergen and Wolken (2001) reported that public agencies, in most of the cases, are unaware of the law, policy or framework whereby sharing information is legitimate. The EIS effort across LGA departments is a complex task since there is no single source of law governing and regulating the gathering, use and sharing of information (Thomas and Walport, 2008). Therefore, LGA departments face with a blurred answer to the question “whether or not we should share information”. Moreover, the legal situations and guidelines defined by the Central Governments are confusing and contradicting (Cleaver *et al.*, 2004). In the United Kingdom, for instance, confusion about the guidelines defined by the Central Government departments (e.g., Department of Constitutional Affairs, Ministry of Justice) has delayed the progress of service delivery (Thomas and Walport, 2008). These ambiguities on legal frameworks would either sanction or prevent information sharing and result in two critical outcomes; first, LGA employees make decisions based on what they feel and understand from the policies and second, the departments completely ignore to collaborate and share information as a result of fear of making mistakes (Thomas and Walport, 2008; Lam, 2005; Fountain and Osorio, 2001). Therefore, *Legislation and Policy Principles* can be counted as an influential factor for EIS in LGAs.

Community Pressures: This factor is related to the concerns of the public over data privacy and data protection which influence the decision of LGA departments to share personal information or not. Bellamy *et al.*,(2005) argue that these pressures are the consequences of the government’s anxiety to protect the public from a variety of risks, such as risks caused by terrorism, crimes, child abuse and fraud. In regards to the EIS effort, LGA staff should be confident in handling and sharing sensitive information attributed to vulnerable citizens and making decisions, which may result in life or death (Bellamy and Raab, 2005). There are, for instance, well-documented cases in which making the wrong decisions about information sharing in LGAs effectively led to tragic outcomes in the United Kingdom (See BBC, 2006;

Bichard, 2004; Laming, 2003). Therefore, perception and attitude of citizens about the way that LGAs handle and share their personal information is not positive. The European Commission recently published a report on citizens' perception on data privacy. The report shows that the citizens' unwillingness about the use of personal information by public sector organisations is widespread across Europe and actually has remained consistent for almost twenty years (Eurobarometer, 2008). According to this report, 64% of EU citizens – and as many as 77% of UK citizens – are concerned about the way that the local authorities handle their personal information. Over the last few years, several polls and surveys have been conducted in the UK to track the public attitude towards information sharing in LGAs. For instance, the results of the Data Guardianship Survey conducted by the British Computer Society in 2008 express that about nine out of ten respondents are concerned about “who is handling their information” and “how and under what circumstances their information is shared” (Georgiou, 2008). In a similar vein, the Data and Privacy Survey by the Institute for Insight in the Public Services shows that about 50% of respondents would not be happy for their personal information to be shared in government departments (Nash, 2008). Therefore, such evidence illustrates that **Community Pressure** caused by concerns over data protection and privacy has become an issue for service providers and should be seen as a potential factor that influence EIS in LGAs.

3.2.2 Investigating Organisational Factors Influencing EIS

The second important category that may influence the effort of EIS in LGAs is Capability of Organisation. In the context of this research, capability of organisation is referred to characteristics of the entire LGA and not its departments. Sharing information among different departments within an organisation directly depends on building and maintaining network relationship and collaboration (Gil-Garcia *et al.*, 2009; Fedorowicz *et al.*, 2007; Pardo and Tayi, 2007). The formation of these collaborations and co-operations is a complicated task as different departments have different goals and interests (Pardo *et al.*, 2007), as well as different human and knowledge capabilities (Nagy, 2004). By reviewing literature on personal information sharing in public sector, this factor group has been divided into four key categories that will be discussed in depth: (a) Inter-organisational Leadership, (b) Return on Investment (ROI), (c) Network Collaboration Culture and (d) Organisational Size.

Inter-organisational Leadership: Inter-organisational leadership refers to the existence,

ability and commitment of top management to provide an optimistic environment for effective inter-departmental EIS. Crosby and Bryson(2005) describe collaboration network as “*no-one-in-charge, shared-power world*” where a great number of departments have only partial responsibility regarding public requests and require a shared power to responding. In today’s government organisations where the walls between IT department and other operational units have fallen, inter-department and cross-boundary leadership have become an essential element of information systems management (Gil-Garcia *et al.*, 2007). As information technology permits most of the operational task, the leadership requires a holistic cross-functional view of the entire organisation (Karahanna and Watson, 2006). Gil-Garcia *et al.*, (2007) emphasise three variables related to the concept of leadership – executive involvement, formal authority and informal leadership – in order to be successful in the inter-departmental EIS effort. Success of IT initiatives in an organisation requires the involvement of top management, which is especially useful for negotiating with higher authorities for budgeting and legal agreements (Eglene *et al.*, 2007). Formal authority also provides a foundation for collaborative efforts as well as trust building among participants in information sharing initiatives (Pardo *et al.*, 2006). Lastly, as IT projects become more complex and require more independent tasks, traditional hierarchical control has been replaced by collaborative and empowering leadership style, with positive effects on the performance of IS teams in cross-departmental IT projects (Faraj and Sambamurthy, 2006). These theorised conceptions demonstrate the importance of ***Inter-organisational Leadership*** as an influential factor regarding EIS in LGAs.

Return on Investment (ROI): Return on Investment in the context of information sharing refers to the analysis of both tangible and intangible costs and benefits, which may influence the decision-making of information sharing. In order to establish an efficient inter-departmental EIS, the implementation and adoption of IOS should be able to provide satisfactory return on investment for the participating departments (Lee and Rao, 2007). Moreover, public sector organisations should consider investing in inter-organisational systems as it results in cost minimisation and risk reduction (Ali *et al.*, 2009). Adopting advanced and integrated corporate IT systems, which is a key prerequisite of information sharing, requires procuring and developing adequate levels of hardware, software and staff training (Kamal and Alsudairi, 2009). However, public sector organisations are often reluctant to proceed with any fresh IT-related investment as the judgements on the

benefits and risks are fairly poor (Irani and Love, 2002). Another reason for this unwillingness of investing on IT is that governments are largely unable to convincingly demonstrate a return on investment that is based on a well-grounded measure (Cresswell, 2006). Wagner and Antonucci(2004) report that LGA budgets are more often reduced or assigned to a specific department/task by Central Governments. This may put pressure on LGAs to just invest on projects with significant ROI. Furthermore, there is confusion in LGAs regarding different solutions that can be implemented in order to integrate the corporate IT systems. As a result, LGA officials do not know how and to what extent they should invest in inter-organisational systems (Janssen and Cresswell, 2005). Based on these discussions, ***Return on Investment (ROI)*** can be regarded as a factor that may influence EIS in LGAs.

Network Collaboration Culture: The delivery and management of public services increasingly relies on complex network collaborations among a variety of agencies and departments (Gil-Garcia *et al.*, 2007), where information can be efficiently exchanged. Formation of such networks has been identified as a complicated and long process since the goals and objectives, as well as the culture and commitments of participating departments are different (Pardo and Tayi, 2007). Research shows that an extensive change, especially in public sector, is required to transform the culture of those departments that previously operated in an isolated environment and are now forced to work as part of a collaboration network (Thomas and Walport, 2008). Drivers, objectives, culture and ethics in LGAs are different compared to private or other public sector organisations as the nature of services and the targeted market varies (King and Cotterill, 2007). Cleaver *et al.*,(2004) argue that information sharing in inter-department collaborations in LGAs continues to be patchy for the reasons attributed to soft cultural factors. Such as all processes within an organisation, sharing information has both risk and benefits. But, the culture of indecision that surrounds the effort of EIS is pragmatic and creates a large amount of risks (Thomas and Walport, 2008). These changes should go beyond a wider transformation in cultural values and viewing personal information as an asset to be handled and shared with respect. While major improvements regarding information governance have been successfully carried out in other sectors during that last few decades, very little development has been carried out in LGAs (6 *et al.*, 2005). The reason may be because of poor staff knowledge and training in the public sector. The results of a research conducted by Ward and Mitchell(2004) on organisations'

priorities regarding information management demonstrate that functional training and education are not routinely provided and only take place when a particular department or individual is requested. Therefore, the employees' capability of professional judgment and thinking about risks and benefits of information sharing would be limited. Thus, according to above discussion, *Network Collaboration Culture* can be considered as a factor that may influence EIS in LGAs.

Organisation Size: Several studies have shown that size of an authority should be considered as one of the determinants to inter-departmental collaboration initiatives (e.g., EIS). Organisation size can be attributed to organisation's resources, transaction volumes and workflow size (Kimberly and Evanisko, 1981). It also can be recognised through the size of the community served and the number of services provided (Akbulut *et al.*, 2009). However, in the relevant literature, some contradictory results can be found about the effect of an organisation size on the adoption of innovation. On the one hand, some researchers argue that adoption of new IT-related initiatives is faster and easier in larger organisations due to greater human and financial resources, greater formalisation, superior institutional ability and decentralised decision-making processes (Vahtera, 2008; Lee and Xia, 2006; Haveman, 1993). While, on the other hand, some other scholars disagree with those arguments by discussing that smaller organisations can be more adoptive to innovation as the flexibility in processes, ability to change rapidly alongside with their environment and less formal administrative structures (Zhang *et al.*, 2006; Damanpour, 1991). Brudney and Selden (1995) point out that organisation size is an important element in information governance and the way in which organisations handle their information for the on-going activities. Larger organisations have a greater number of departments and employees to be participating in inter-department information sharing. The effectiveness of sharing information, therefore, would be affected by the size and diversity of collaborations. Regarding information sharing in LGAs, research indicates that the size of an authority should be taken into account as it would affect the level of funding allocated to the LGA, level of investment on new technologies and involvement of the participating departments (Cleaver *et al.*, 2004). Thus, based on the above arguments, *Organisation size* is considered as a potential factor that may influence the effort of EIS in LGAs.

3.2.3 Investigating Technological Factors Influencing EIS

The third essential factor group is Technological Environment, which focuses on the

characteristics of EIS from a technical point of view. 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 the result of new technologies have transformed and are continuing to transform the processes in organisations especially in the public sector (Thomas and Walport, 2008). Although government organisations have lagged behind in terms of the technology they deploy, new IT tools especially web-based applications are becoming more and more predominant in local authorities (Kim and Bretschneider, 2004). Several scholars advocated the benefits of sharing information in local authorities by harnessing new technologies (Kamal and Alsudairi, 2009; Klievink and Janssen, 2008; Tarabanis and Tambouris, 2006; Senyucel, 2005; Kim and Bretschneider, 2004; Beynon-Davies and Williams, 2003; Beaumaster, 2002; Ho, 2002). Technological advances have had drastic impacts on inter-departmental relationships and collaboration, the way they collect, store and share personal data. However, the issues of IT capability (Kim and Bretschneider, 2004), meaning and semantic translations of data gathered from a variety of sources (Pardo and Tayi, 2007), integration among different corporate IT systems (Lam, 2005) and citizens' privacy protection (Bellamy *et al.*, 2005) are central to sharing information especially in public sector organisations. Therefore, based on the relevant literature on inter-department collaboration and information sharing at a local level, the technological environment was divided into four main categories for further investigation: (a) IT Capabilities, (b) Data Security and Privacy, (c) Information Quality, (d) Interoperability Framework.

IT Capabilities: In the context of this research, the general perception of IT capability is the ability of an LGA department to effectively apply IT tools to achieve the desired outcome and that is to share information with other departments. Akbulut *et al.*, (2009) stated that summation of the level of (1) IT Infrastructure, (2) IT sophistication and (3) Staff IT knowledge defines the IT capability of an organisation. As stated earlier, IOSs are complicated systems since a number of databases, hardware and telecommunication technologies should be integrated and interoperable. Thus, participating in such systems requires a certain level of IT infrastructure. However, lack of sufficient IT foundation in LGA departments has been identified as an obstruction to inter-department collaboration initiatives (King and Cotterill, 2007; Kim and Bretschneider, 2004). The results of a research on 138 local government agencies in United States conducted by Beaumaster (2002)

demonstrate that level of the IT infrastructure in LGAs is very low as a result of the absence of IT planning, inappropriate IT procurement and unverified IT implementation. Furthermore, IT capability can be measured by the level of IT sophistication, which represents technological skills readiness. Wu (2004) stated IT sophistication as a factor influencing inter-department collaboration. According to her, those organisations with sophisticated IT resources have a higher level of readiness in order to adopt any information sharing initiatives such as Electronic Data Interchange (EDI). Themistocleous (2004) also reported IT sophistication has an impact on application and information integration due to the level of understanding and ability of problem solving at a departmental level. Additionally, IT capability can be outlined by the level of staff IT knowledge. Thomas and Walport (2008) claim that most data breaches and inappropriate use of personal information in local government agencies have been caused by human error due to a lack of knowledge and training. They argue that even with good IT guidance materials, confusion and uncertainty can be raised if the trainings are not taken seriously. It would be vital to have a certain level of IT experts with the departments to make individual decisions about how certain information can be shared. The results of the survey conducted by the Society of IT Managers in the Public Sector (SOCITM) in LGAs in the UK illustrate an extremely low level of investment in staff training in information management (SOCITM, 2010). Based on the above argument, *IT Capability* is considered as a factor that may influence EIS in LGAs.

Data Security and Privacy: Data security and privacy have been described as one the significant elements in the context of inter-department collaboration (Nash, 2008; Bellamy and Raab, 2005). However, several security architectures used by different departments act as blockage to adopt any e-government initiatives such as EIS (Lam, 2005). The lack of data security would result in reducing public trust and confidence in a department's ability to handle and share personal information. Opinion surveys over a long period of time have shown that citizens have little trust in the way that public organisations use their personal information due to uncertainty on whether or not their data is kept and shared securely (Eurobarometer, 2008; Georgiou, 2008; Nash, 2008). When personal information is pulled together from several different sources (different departments and different IOS) in order to deliver a specific public service, all involved departments must ensure the links are secure and safe. Recently, some governments in developed countries have attempted to design technological solutions, generally called Privacy Enhancing Technologies (PETs) to improve

personal data security and give citizens more confidence in interacting with the local agencies (CabinetOffice, 2002). PETs refer to coherent ICT systems that protect citizens' privacy by preventing unnecessary or undesired processing of personal information without losing the functionality of the whole system (van Blarckom *et al.*, 2003). As another example, some UK's local government authorities have mandated their department to work towards ISO 27000 series, the International Standards for Information Security Management while inter-departmental EIS is taking place (LeicestershireCountyCouncil, 2009; SurreyCountyCouncil, 2009). These standards give managers and staff a framework for implementing a risk management approach to assist them in managing their information security. However, Thomas and Walport (2008), the reviewers of data sharing protocols in the UK public sector, criticised the decision of LGAs in using ISO standards. They stated that rather than mandating a specific security standard whether it be based on ISO 27000 series or others, the LGAs should be constantly evolving technology of best practice in the use of ICT tools to share personal information securely. So tensions among departments regarding the sharing of citizens information with a secured and protected approach have become an unsolved issue in public policy and resulted in negative impacts on network collaborations (Bellamy *et al.*, 2007). Thus it can be emphasised that **Data Security and Privacy** may influence EIS in LGAs.

Information Quality (IQ): Successful information sharing in inter-department collaboration strongly relies on the quality of the information (Klischewski and Scholl, 2006). Information quality can improve the way the LGA departments collaborate and enhance the quality of service delivery towards the public. Various aspects of IQ have been studied in numerous disciplines such as Information Science (e.g., Herrera-Viedma *et al.*, 2006; Marchand, 1990) as well as Information Systems Research, Computer Science and Engineering (e.g., Corradini *et al.*, 2006; Klischewski and Scholl, 2006; Price and Shanks, 2005) along with e-Commerce and e-Government studies (e.g., Colesca and Dobrica, 2009; Tan *et al.*, 2008; Klischewski and Scholl, 2006). Even though IQ has been studied by a variety of researchers from the above disciplines, its assessment criteria has a similar explanation and mainly based on the dimensions developed by Taylor and Voigt (1986). These criteria have been summarised in Table 3-1 based on their definitions and the relevancy to EIS in LGAs.

Dimension of Information Quality	Definition (Taylor and Voigt, 1986)	Relevancy to EIS in LGAs
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1	Accuracy	It assures the user that the particular information is a true copy without any claim to its validity.	It refers to the assurance of the department that their information is accessed, transmitted and received accurately in the information sharing processes.
2	Objectivity	The Comprehensiveness of the information accessed or received.	This IQ criterion refers to the defined wants/needs of information sharing that should be well understood among participating department.
3	Currency	Shows the needs of real time and live information.	Some departments require the existence of real-time information and information sharing.
4	Authority	The characteristics and creditability of the information seeker attributes to certain sources of information.	The level of accessibility of each participating department to particular piece of information.
5	Reliability	The assurance that rests on past experience and previous use of information systems which produce data.	The trust that each participating departments should have regarding the source of information.
6	Relevance	The importance of the data in order to complete a particular task	It refers to the usefulness, creditability and assurance of information capacity.
7	Timeliness	The level to which information can be delivered with a specific time-frame.	In some specific operations (e.g. police operations) it is vital to share specific information in a pre-defined time-frame.
8	Perceived Value	It is determined by the information seeker's accumulated experience with the information itself and the information sharing processes.	In an information sharing environment, it directly influences the extent of information stewardship and information use.

Table 3-1: Information Quality Dimensions (Adapted from (Klischewski and Scholl, 2006)

Since information quality has a key role in information sharing efforts, it is important that all participating players within an LGA have a common view about it. It would be vital to identify the level of IQ to take into account when departments deal with sensitive and personal information. Klischewski and Scholl (2008) argue that building a common perspective towards IQ in inter-department collaboration is a complicated task since first, the wants and needs of participating agencies are dissimilar and second, the meaning of information may change in time and over time. Therefore, these issues may have undesirable consequences on information sharing and that highlights the consideration of *Information*

Quality as a factor that may influence EIS in LGAs.

Interoperability Framework: One of the most important actions to improve information sharing in inter-department collaboration in the public sector is to define compatibility standards to be adopted among information systems implemented in organisations (Dos Santos and Reinhard, 2007). In this sense, technical interoperability refers to a property of diverse IT systems enabling them to work together (CabinetOffice, 2005b) allowing government organisations to share information and integrate business processes by employing common standards (UNDP, 2007). Archmann and Kudlacek (2008) define interoperability as the ability of ICT systems to communicate and interchange data in a meaningful manner based on agreed and established standards. Therefore, interoperation of systems is the foundation of information sharing in inter-department collaboration. When systems and organisations are able to interoperate then information can be accepted and shared among them (Gottschalk and Solli-Saether, 2009). According to Parazoglou (2006), systems interoperability requires standardisation in four different aspects: technology, syntax, semantics and pragmatics. Technology standards refer to middleware integrity, network protocol and security protocol. Syntax standards concern how participating departments agree on integrating heterogeneous applications based on the structure or language of the messages exchanged. Semantic standards are the extension of syntactic agreements on the meaning of the terms used for the agencies' information systems. Lastly, pragmatic standards refer to the agreements on protocols, which would be triggered by specific pieces of information. Several countries have developed their e-government interoperability framework in order to facilitate their service delivery processes. In the United Kingdom, for example, the e-Government Unit of the Cabinet Office has published the technical guidance called the UK e-Government Interoperability Framework (e-GIF) in 2005 (CabinetOffice, 2005a). It includes a Technical Standard Catalogue which mandates several sets of standards and specifications for any cross-departmental collaboration and for e-government service delivery. Yet, after publishing all these technical specifications, research shows that ICT systems are still incompatible in LGAs (Kamal and Alsudairi, 2009; Scholl and Klischewski, 2007; Lam, 2005). The public Administration Select Committee in United Kingdom reported that although the e-GIF was mandated, there is no development or auditing of its use at a local level. Lam (2005) also argues that data formats used by one application in one department maybe incompatible or even non-readable by other applications in another department. Effective inter-

departmental EIS requires a network of interoperable ICT systems where information can be flown smoothly among them. Therefore, *Interoperability Framework* is considered as a key factor that may influence EIS in LGAs.

3.2.4 Investigating EIS Characteristics Influencing EIS Participation

The fourth factor group that may influence the decision of LGA departments on whether or not to participate in electronic information sharing is the Characteristic of EIS itself. The influence of innovation characteristics on the adoption of decision-making processes has been regularly researched in both the private (e.g. Straub, 2009; Adesina and Zinnah, 1993; Tornatzky and Klein, 1982) and the public sectors (e.g. Damanpour and Schneider, 2009; Tat-Kei Ho, 2002; Berry, 1994). Zaltman *et al.*, (1973) discovered more than 21 characteristics of innovation, which were gathered mainly from the literature on diffusion of innovation. Rogers (1983) also identified the attributes of innovation that have a key role in acceptance and adoption of decision-making 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. They validated these three hypotheses along with other organisational and environmental characteristics on the adoption of 25 technological innovations in 725 local governments in the United States. Considering the effect of each innovation attribute alone, the findings for innovation adoption support previous research (i.e., Rogers, 1983; Tornatzky and Klein, 1982). However, the researchers suggested that more research on the influence of these characteristics on innovation adoption in public organisations is required due to the differences in organisational structure and characteristics in the public sector organisations. Based on the literature on personal information sharing in the public sector, the EIS characteristics were divided into three categories which will be discussed in depth: (a) Costs of EIS, (b) Benefits of EIS and (c) Risk of EIS.

Costs of EIS: The costs of technological innovation and its impact on adoption have been widely examined in the literature as it is an essential component of efficiency in organisational performance and is fairly easy to measure (Damanpour and Schneider, 2009; Rogers, 1995). In the context of this research, cost refers to all perceived potential costs of participating in information sharing including the cost of procuring relevant hardware and/or software, cost of migration from the old systems to the new ones as well as cost of staff training (Akbulut *et al.*, 2009; Akbulut, 2003). There are two different viewpoints regarding

the implications of cost on EIS in the public sector. Some scholars (e.g. Fedorowicz *et al.*, 2010; Fedorowicz *et al.*, 2010; Akbulut *et al.*, 2009; Landsbergen Jr and Wolken Jr, 2001) argue that cost has negative effects on participating departments, while others (e.g. Gil-Garcia *et al.*, 2009; Gil-Garcia *et al.*, 2009; Drake *et al.*, 2004) indicate that cost can have an inspiring role in order to push public agencies to establish such initiatives within their departments. Landsbergen and Wolken (2001) stated that due to ineffective cost and benefit analyses in public sector agencies, the objectives of information sharing are ill-defined and therefore it would be difficult to encourage departments to participate in EIS. Dawes (1996) also reported administrative costs as a negative factor influencing information sharing. The results of her research indicate that sustainability in information sharing may contain some hidden costs due to resource sharing among participating departments that could not be anticipated previously. In the same direction, Fedorowicz *et al.*, (2010) argued that adoption of IOSs that requires collaboration among different departments in the public sector have failed since the aligning of business processes of the participants are timely and costly. On the other hand, network collaboration would result in sharing resources (e.g., software and knowledge) among participating agencies and this would reduce the transactional costs for the departments (Gil-Garcia *et al.*, 2009). Since public agencies can improve their speed of service delivery through EIS, their operational costs would be consistently decreased (Carter and Bélanger, 2005). On the basis of the abovementioned arguments, Cost of EIS should be considered as a factor that may influence the effort in LGAs.

Benefits of EIS: Benefits refer to the perceived gains of participating in electronic information sharing. Relevant research illustrates that identifying potential benefits of inter-department information sharing in the public sector can play an important and encouraging role. As discussed in the previous Chapter, successful information sharing projects can bring several advantages such as increased productivity, improved decision-making processes and shared and integrated service delivery (Gil-Garcia *et al.*, 2007; Dawes and Préfontaine, 2003). Gil-Garcia *et al.*, (2007) conducted research on six public sector information sharing projects at the State and Local levels in the United States and discovered three main issues that limit the expected benefits. Firstly, a controlled-oriented management style, which creates an environment where the project team members feel their decisions are not taken into account and individual initiatives are not important. Secondly, lack of agreement on a mutual and fixed goal, which results in changing the goal constantly bringing conflict

among participating departments. Lastly, unreal expectations of project outcome and impatience in gaining benefits in the early stages of the projects. These situations can severely limit the expectation of information sharing benefits and may result in failure of the project. Although several benefits can be gained from EIS participation, they should be identified and set based on the organisation's resources in order to keep the expectations real (Lee and Rao, 2007; 6 *et al.*, 2005). The reachable expectations would result in establishing realistic strategies towards information sharing and perhaps extra expenditure where it is appropriate (SOCITM, 2010). Therefore, the above analyses give sufficient justification to consider ***Benefit*** as a factor that may influence EIS in LGAs.

Risk of EIS: Similarly to costs and benefits, organisations recognise and analyse the perceived risks associated with information sharing (Dawes, 1996). In the context of EIS in LGAs, concerns about expected risks can be divided into technological risks and non-technological risks (Evangelidis, 2005). Technological risks refer to the risks of implementing and adopting new IT systems that enable sharing information in an electronic manner. Dawes *et al.*, (2004) stated that public sector organisations, either purchase wrong IT systems to address their intended objectives, or buy the right technology but do not implement and use it effectively. Moreover, migrating from existing systems to integrated systems where data can be shared based on standards is risky since it may result in loss of information (Akbulut *et al.*, 2009). Margetts (2005) also argued that it has become the norm in the public sector to employ private sector providers to develop and maintain their information technology. This outsourcing would cause several risks such as lack of full control on personal information, using different providers within the organisations that make integrity much more complex and unrealistic expectations with multiple objectives for outsourcing (Lacity and Willcocks, 2000). Furthermore, inter-department EIS must deal with non-technological or so-called social risks. Initially, as EIS involves sharing sensitive information, the department should trade off various risks before making decisions about sharing information (Bellamy *et al.*, 2007). These include risk of stigmatisation, risk of spreading and leaking citizens' information and risk of blame to the employees if matters go wrong (*ibid*). Another concern is criticisms over information sharing (Fedorowicz *et al.*, 2007) chiefly by the public as EIS results in openness and transparency among government organisations. The criticism may also come from other agencies since EIS may result in decreasing data accuracy or validity of the shared information (Akbulut *et al.*, 2009).

Consequently, *Risk of EIS* becomes an important issue and should be taken into account as a factor that may influence the effort in LGAs.

3.2.5 Investigating Inter-departmental Factors Influencing EIS

The last factor group that may influence the EIS decision-making is the Inter-departmental Environment. Since the initiative of this research is to identify the factors that influence the effort of EIS within a single 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 (Vangen and Huxham, 2003). These horizontal arrangements between different departments that improve the delivery of public services have been often referred to as “network” in the scholarly literature (e.g., Lips *et al.*, 2009; Fedorowicz *et al.*, 2007). In the context of inter-department information sharing, forming and maintaining these networks act as the foundation (Pardo and Tayi, 2007). However, working across different departments and sections in a networked style is not easy and requires additional time, budget and effort (6 *et al.*, 2005). Relevant research findings show that public organisations have difficulties in order to establish such networks among their departments. They are faced with complications over integrating departmental business processes (Fedorowicz *et al.*, 2010; Pardo and Tayi, 2007; Fountain and Osorio, 2001), creating trust (Neergaard and Ulhoi, 2006; Pardo *et al.*, 2006; Dirks and Ferrin, 2001a) and restructuring departments arrangement (Dawes and Préfontaine, 2003; Mandell, 2001). Therefore, based on the normative literature on information sharing in LGAs, the inter-departmental factors are divided into three main categories: (a) Business Process Compatibility, (b) Inter-departmental Trust and (c) Critical Mass.

Business Process Compatibility: In the context of EIS in LGAs, besides technological integration, harmony in participating departments’ business processes has been identified as an essential issue (Pardo and Tayi, 2007; Drake *et al.*, 2004). Business process integration organises a variety of processes across enterprise boundaries such as those involved in a supply chain network (Ray *et al.*, 2007). A wide range of studies on information sharing in the public sector demonstrate that this effort would only save money and improve performance if the decisions and business processes are aligned or merged (e.g. Fedorowicz *et al.*, 2007). In an environment like local government authorities where each department has individualised business rules and policies that dictate how the decision should be made and

the work should be done, collaboration and cooperation become unmanageable. Beynon-Davies and Williams (2003) found that there is not much emphasis on reengineering of business processes in the public sector. The reason is that in a hierarchical bureaucratic structure of local authorities, business processes and functions are often difficult to change (Janssen and Cresswell, 2005). Therefore, ***Business Process Compatibility*** can be considered as a factor that may influence EIS in LGAs.

Inter-departmental Trust: One approach to think about information sharing is to focus on its social facets in which networks of individuals and organisations should collaborate (Gil-Garcia *et al.*, 2009). In such networks where information is required to be shared, collaborative relationship is strongly reliant on mutual trust. This would indeed reduce the conflicts and risks among the participating departments (Dirks and Ferrin, 2001a). Build upon five different perspective on inter-department trust i.e. (Jones and George, 1998; Ring and Van de Ven, 1994; Sako, 1992; Shapiro *et al.*, 1992; Zucker, 1986), Newell and Swan (2000) came up with three types of trust, including companion trust, competence trust and commitment trust. Companion trust is a process-based trust that is developed over long time. This type of trust refers to a trust that is based on judgments of goodwill or personal friendship among different departments. Competence trust is based on the other departments' capability to carry out the task that needs to be carried out jointly. Lastly, commitment trust is developed on an institutional basis where each department is expected to gain mutual benefit. On a different note, Pardo *et al.*, (2006) emphasised trust building as an important element of the social capital that is essential for any type of successful cooperation and collaboration within and across social networks. Previous research has shown that the level of trust has a direct influence on the level of participation in sharing information (e.g. Gil-Garcia *et al.*, 2010; Edelenbos and Klijn, 2007; Neergaard and Ulhoi, 2006; Pardo *et al.*, 2006; Dirks and Ferrin, 2001b; Zaheer *et al.*, 1998). In some cases, a high level of trust can contribute to a full participation of all relevant departments even with very complex business processes, while in other cases a low level of trust can result in a constant and poor setting for sharing of even very basic information (Pardo *et al.*, 2006). This low level of trust may exist due to the existence of competitive relationships among the participating departments, lack of leadership and absence of a formal structure to support cooperation (Cresswell *et al.*, 2006). All the above issues are valid in inter-departmental collaboration at a local level where service delivery towards citizens and businesses relies on joint operations. Thus, ***Inter-***

departmental Trust should be taken into account as a factor that may influence inter-departmental EIS initiative in LGAs.

Critical Mass: In the context of inter-departmental information sharing in the public sector, critical mass refers to the number of departments that are participating or planning to participate in EIS, the nature of their collaborations and the level of their contributions. This may influence the decision of other departments that have not started this initiative yet (Akbulut *et al.*, 2009). Bouchard (1993) labelled these actions as “*Critical Mass Theory*”. As it is discussed in the previous Chapter, adopting an innovation in a network collaboration of different departments relies mainly on “what the network is doing” rather than “what the characteristics of the innovation are”. From social science point of view, critical mass creates a feeling among the potential users that since most of the departments within the organisation have adopted the innovation, it is their obligation to use the same technology and failing to do so may bring negative consequences (Lou *et al.*, 2000). Research has shown that LGAs are directly affected by the actions of other local authorities in IT innovation (Akbulut *et al.*, 2009; Kamal and Alsudairi, 2009). However, to the knowledge of researcher, there is not enough evidence that shows how the action of one department can influence the decision of other potential ones in inter-departmental EIS. Therefore, it can be argued that *Critical Mass* should be investigated more in the context of EIS in LGAs.

Figure 3-2 illustrates the proposed factors that may influence the effort EIS in LGAs. As it can be observed, there are two-way links among the categories and the action of organisations. The reason is that although the Capacity of Organisation, the Technology Environment and the EIS characteristics may enable or constrain the action of a LGA in EIS participation, through dynamic interactions in the Inter-departmental Environment overtime, the LGA is also able to modify its capacity and structure.

Nevertheless, these factors have yet to be evaluated through real and practical cases and therefore the researcher proposes the following research proposition for further investigation:

Research Proposition A –Proposed Factors Influencing EIS: The proposed factors (Figure 3-2) influence decision-making in electronic information sharing in inter-departmental collaboration in local government authorities.

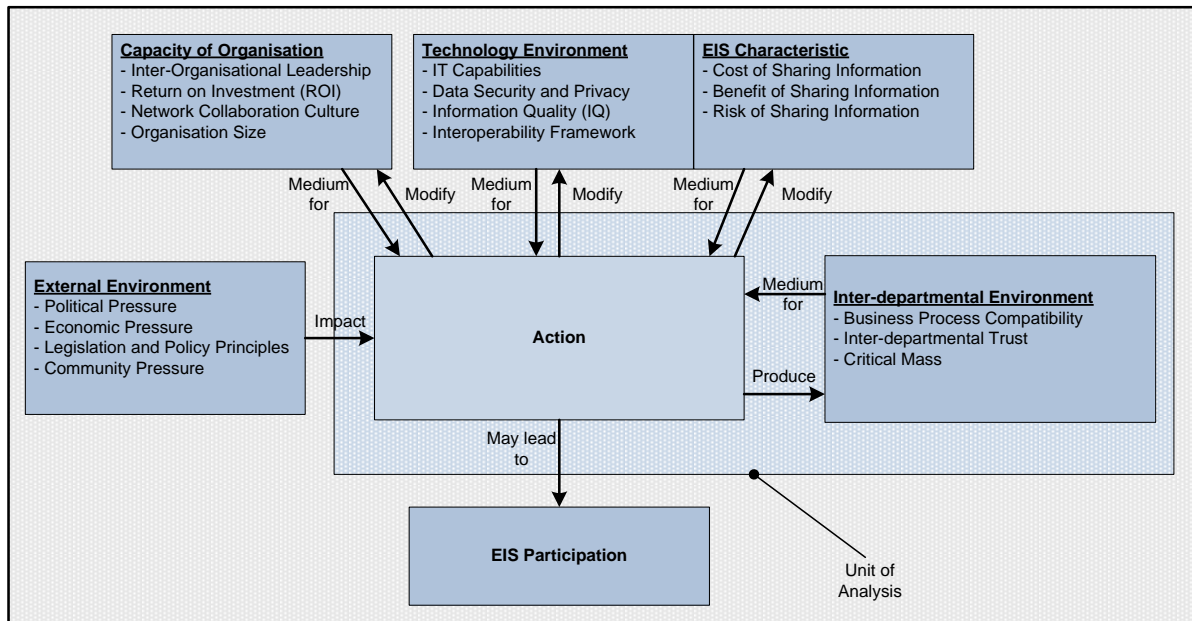


Figure3-2: Proposed Factors Influencing EIS in LGAs

The proposed factors make a novel contribution at the conceptual level. These factors have been identified from previous research on information sharing, innovation adoption and public administration. The researcher has extended these works and adopted the factors to EIS in local government authorities. Since decision-making about sharing information among LGA departments has become an unresolved concern for management and administration teams, realising these factors may provide a deeper understanding of the phenomenon and assist the decision-making process.

3.3 Investigating the Phases of EIS Participation

Sharing information through IOS can be considered as an innovation not because it utilises new technologies, but because it enables reengineering of existing processes and workflows (Fedorowicz and Gogan, 2010). Therefore, participation in information sharing in inter-departmental collaboration, similar to any other innovation adoption, involves a sequence of stages that a department goes through while sharing information electronically. Regarding this, Rogers (1995) indicates that an adoption process is the process in which an individual or agency first experiences the knowledge of innovation, second alters the attitudes towards that innovation, third makes a decision to adopt or reject and last implements and confirms the decision. Recent literature on innovation adoption in private sector has coined the notion of “*open innovation*” where two innovative agencies or departments with diverging strategies and capability may collaborate for a better outcome (e.g., Andersson *et al.*, 2008; Chesbrough,

2006). In this type of innovation environment, the adoption is largely dependent on the characteristics of the network collaboration. Walker *et al.*, (2011) classified this type of innovation as “*Ancillary or Partnership Innovation*” that reflects the shift to partnership and networking collaboration in the delivery of modern public services. It should be highlighted that the successful implementation and adoption of any partnership effort, such as EIS, is reliant upon other partners’ capability and resources.

Regarding inter-departmental information sharing in LGAs, it would be vital to clarify the stages in which each department adopts while the effort is taking place. These stages that lead to institutionalisation of EIS within LGAs may be conceptualised as chronological consequences in which the departments go through from the initiation phase to sustainability in information sharing. However, to the knowledge of the researcher, there are not many academic studies that intensely examine this conception in public sector. After analysing innovation adoption literature in private sector (e.g. Damanpour and Schneider, 2009; Chesbrough, 2006; Damanpour and Schneider, 2006) and in the public sector (e.g. Walker *et al.*, 2011; Fedorowicz *et al.*, 2010; AGIMO, 2006; Kamal, 2006), the following five phases of participation can be proposed; (a) Incentive, (b) Conception (c) Proposal (d) Participation Decision, (e) Sustainability.

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 that this phase consists of activities that assist the organisation recognising a need and becoming aware of existing innovations. In this stage, the department should acquire the knowledge of why information should be shared and what would be the best solution for doing that. This phase can be signified as the initiation phase when the decision-makers can examine whether or not sharing information would result in better service delivery. These lead to motivating the operational staff in ascertaining an attitude towards the adoption (Kamal, 2006).

b) Conception signifies a plan of action which the agency should pursue (Kamal, 2006). Rogers (1995) refers to this stage as *Persuasion* that occurs when the decision-making unit forms a positive or negative attitude towards the innovation. In the context of EIS, this phase may consist of a set of questions to be answered by the LGA department prior to EIS. Those including whether or not the department has a legal basis for sharing

information, or whether the information enables the individual(s) to be identified. On one hand, having a clear answer to the questions may facilitate information sharing, while on the other hand, uncertain answers may suspend the entire process of sharing information.

- c) **Proposal** indicates the formal proposition for adopting any kind of innovation within the organisation (Kamal, 2006). In the context of EIS, this phase can be done by setting protocols or an agreed set of principles that can govern the sharing of confidential information. Signing up to the protocol by each department helps to understand the circumstances in which the department can share information and what the responsibilities are (Surrey County Council, 2009). This phase would be crucial as each department within a LGA requires analysing their requirements and examining their capabilities in order to participate in information sharing effort. These formal justifications are prepared by top level management (Irani and Love, 2002) and frequently, would result in sustainability of the information sharing initiative.
- d) **Participation Decision** refers to the actual phase when a department takes the decision to adopt 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 – i.e. defining (a) why information may need to be shared and how this sharing will be managed and controlled by the department, (b) the purposes for which departments have agreed to share information, (c) policies and procedures that support the sharing of information between departments and (d) process for the implementation, monitoring and reviewing of the protocol.
- e) **Sustainability** refers to the stage when an organisation begins to realise the need for strategic changes towards the use of innovation (Kamal, 2006). This step may be considered as the post-adoption stage, however in the context of EIS in public sector, it is a vital stage since sustainability in inter-departmental 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. Pardo *et al.*, (2007) revealed that reaching the stage of sustainability in inter-departmental information sharing in government is dependent on three main factors; (a) comprehensive technical and organisational interoperability, (b) alteration of an agency's culture and (c) ability of top

management to alleviate key constraints.

The abovementioned phases have been illustrated in Figure 3-3.

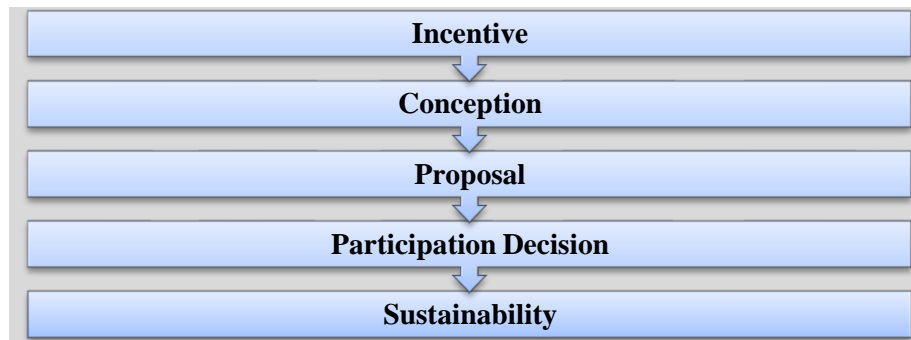


Figure3-3: Proposed Phases of EIS Participation in LGAs

This section moves the research one step forward by improving the decision-making processes in LGAs while sharing information electronically. The proposed phases are yet to be evaluated in practical cases, hence the researcher proposes the following research proposition for further investigation:

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

3.4 Mapping EIS Participation Factors to Participation Phases

The existing studies on EIS in different sectors such as healthcare (e.g. Mantzana *et al.*, 2008; Khoubati and Themistocleous, 2006) and SMEs (e.g. Koh *et al.*, 2008; Welker *et al.*, 2008) have examined several issues regarding the role of the main stake holders and the causal relationships among different participating departments. Yet from a conceptual and empirical point of view, none of the existing research on EIS has investigated the mapping of the factors influencing participation in EIS to different phases of participation (Figure 3-3). This can be considered as a gap in the relevant literature and it can be argued that it is important to investigate this since: (a) the identified factors influencing EIS (Figure 3-2) requires to 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 that issue becomes easier for the departments.

Based on this argument, it can be claimed that it is worth examining the mapping of EIS participation factors on to participation phases in LGAs. The actual mapping would be carried out after conducting the empirical research. Hence, the following research proposition can be stated as follow:

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

An example of the above proposition is demonstrated in Figure 3-4 where one or more influential factors of those proposed in Figure 3-2 have been mapped to different phases of participation.

Incentive Phase	Conception Phase	Proposal Phase	Participation Decision	Sustainability Phases
<i>Factors</i>	<i>Factors</i>	<i>Factors</i>	<i>Factors</i>	<i>Factors</i>
F1	F1	F1	F1	F1
F2	F2	F2	F2	F2
F3	F3	F3	F3	F3
F4	F4	F4	F4	F4
F5	F5	F5	F5	F5
F6	F6	F6	F6	F6
...
Fx	Fx	Fx	Fx	Fx

Figure3-4: An Example of Mapping Influential Factors to Participation Phases

3.5 Investigating the Prioritisation of Factors

Several perceptions on the prioritisation of factors that influence a phenomenon in an organisation have been indicated in the literature on management and information systems (e.g. Lam and Chin, 2005; Salmeron and Herrero, 2005). However, a common description can be considered as the process of ranking all the factors regarding their relative need or importance that would assist the decision-making process in an organisation (Kamal and Alsudairi, 2009).

Electronic information sharing in inter-departmental collaboration involves distributed decision-making, which is based not only on the decision of one department, but also on the decision of all participating departments. This characteristic makes information sharing even riskier and may result in unpleasant outcomes (Thomas and Walport, 2008). Moreover, the LGAs' structures, business processes and operational functions are often difficult to re-engineer as hierarchical bureaucratic structures reflect a commitment to out-dated cultural values that make the decision-making processes more problematic (Beynon-Davies and Williams, 2003). Based on these arguments, numerous studies indicate that prioritisation of factors and identifying which factor(s) is more important should be taken into account as it enables the organisation to improve the procedure of decision-making (Salmeron and Herrero, 2005; Huang *et al.*, 2004).

Saaty (1986) argued that the development of prioritisation is strongly reliant on the judgement of individuals who are involved in the phenomenon within the organisation. However, because of the different roles, responsibilities, attitudes and backgrounds within an organisation, the individuals may present different judgements on the prioritisation of factors (Lam and Chin, 2005). These diverse judgements can be synthesised by using certain methods such as scoring, ranking, mathematical optimisation and multi-criteria that have been applied to several IT adoption studies (Kamal, 2008; Salmeron and Herrero, 2005; Wei *et al.*, 2005). The identification of a suitable method will be presented in Chapter 4 followed by empirical evaluation in Chapter 5.

3.6 Prioritisation of the Factors in Relation to the Participation Phases

The abovementioned arguments demonstrate that, to a great extent, prioritisation of factors may determine whether or not inter-departmental information sharing would have a constructive result(s). The existing literature on information sharing in inter-departmental collaboration mainly focuses on examining the causal inter-relationship between the factors (e.g. Pardo and Tayi, 2007) and the inter-relationship between the factors and actors (e.g. Lips *et al.*, 2011). To the best knowledge of the researcher, none of the existing studies on information sharing has investigated the prioritisation of factors influencing EIS participation in relation to the participation phases.

This can be considered as a gap in the literature and it can be argued that it is important to understand all aspects of EIS participation in depth prior to the initiation of the effort.

Thus, the following research proposition can be proposed for further 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-department collaboration.***

An example of the aforesaid research proposition has been illustrated in Figure 3-5 where one or more influential factors have prioritised on different participation phases based on their importance.

Incentive Phase	Conception Phase	Proposal Phase	Participation Decision	Sustainability Phases
<i>Ranking of Factors</i>	<i>Ranking of Factors</i>	<i>Ranking of Factors</i>	<i>Ranking of Factors</i>	<i>Ranking of Factors</i>
F1	F1	F1	F1	F1
F2	F2	F2	F2	F2
F3	F3	F3	F3	F3
F4	F4	F4	F4	F4
F5	F5	F5	F5	F5
F6	F6	F6	F6	F6
...
F _x	F _x	F _x	F _x	F _x

Figure3-5: An Example of Prioritisation of Influential Factors in relation to the Participation Phases

The arguments reported in the previous sections (Section 3.2 to Section 3.5) prove that the role of factors, participation phases, mapping of factors to participation phases and prioritisation of factors in relation to the participation phases should be taken into consideration while sharing personal information electronically in inter-department collaboration in LGAs. The researcher proposes that the research propositions (RP-A to RP-D) identified in the previous sections should be examined jointly. In doing so, a detailed conceptual framework for electronic information sharing in local government authorities is proposed in Figure 3-6.

The proposed framework consists of (a) the factors that may influence the EIS participation presented in Figure 3-2, (b) the decision-making phases that each department may adopt prior to inter-departmental EIS presented in Figure 3-3, (c) the mapping of EIS factors to participation phases, which is reported in section 3.4 and (d) the prioritisation of the influential factors in relation to different participation phases.

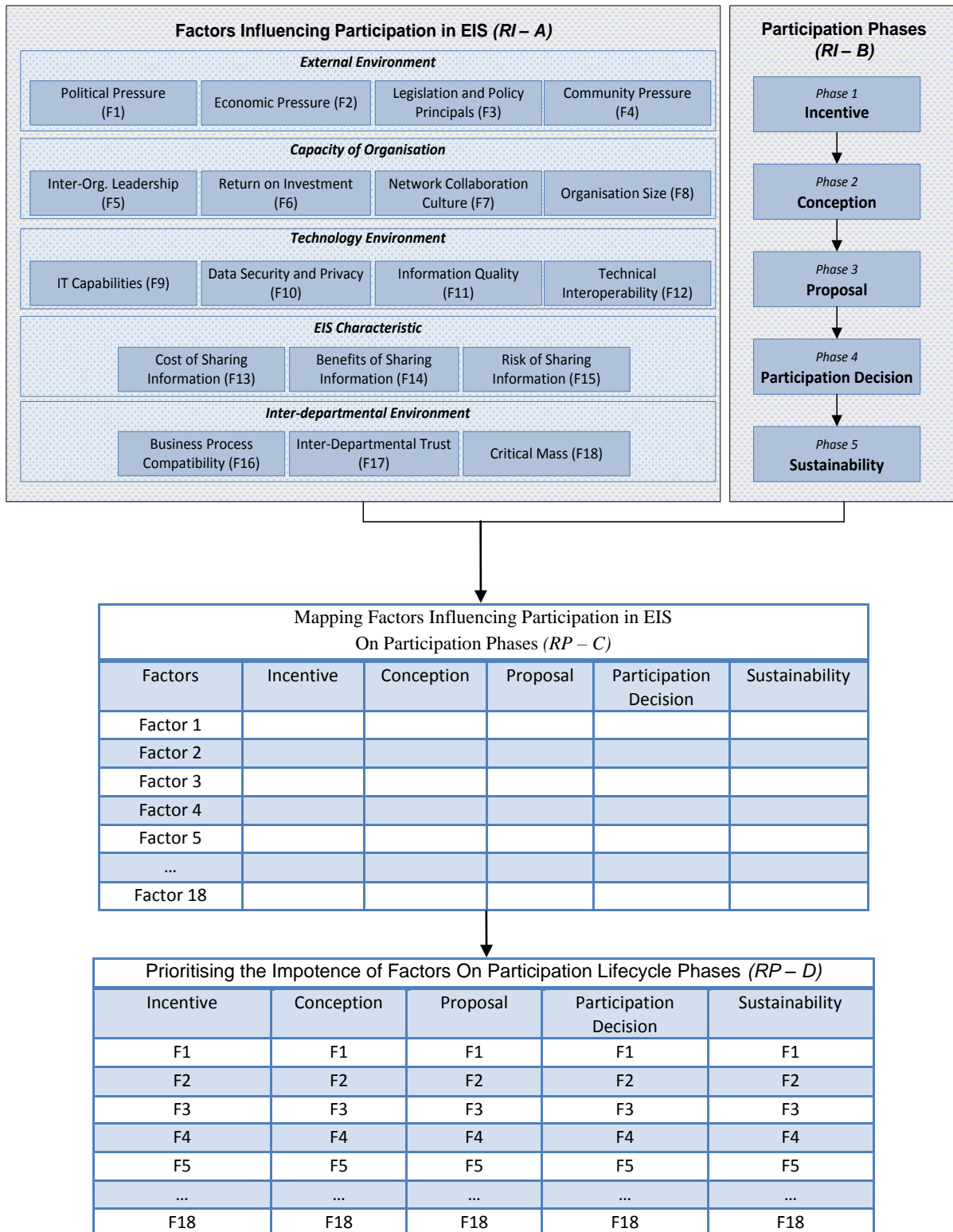


Figure3-6: Proposed Conceptual Framework for EIS Participation in LGAs

3.7 Conclusion

This Chapter mainly focused on the gap in the literature regarding the absence of a conceptual framework to examine electronic information sharing in inter-

departmental collaboration in local government authorities. Based on several reasons and issues drawn from the existing studies and frameworks (reported in Chapter 2), it was stated that there is a need for developing a framework in order to examine the above initiative comprehensively. These reasons can be summarised as follows:

- The number of studies in information sharing in public sector is very limited.
- The existing frameworks that examine information sharing mainly focus on organisational and policy or technological aspects of the initiative and also mainly concern information sharing in Federal/Central Government.
- The existing frameworks do not examine the phases that each participating department may adopt prior to sharing personal information.
- There is not such clarification on the importance of factors and prioritisation of them based on different phases of information sharing.

Therefore to resolve these issues a conceptual framework was developed initially based on the procedural framework of Kurnia and Johnston (2000) – illustrated in Figure 3-1. It was discussed that this framework can be considered as one of the foremost sources of reference in the context of inter-departmental collaboration. However this framework has been mainly evaluated through practical cases in the private sector, the researcher expanded the scope of it through exploring factors associated with government authorities at the local level and summarised them into five key categories including (a) External Environment, (b) Capability of Organisation, (c) Technology Environment, (d) EIS Characteristics and (e) Inter-departmental Environment (Figure 3-2). It was reported that the identified factors (Section 3.2.1 to Section 3.2.5) which have been grouped in the above categories may influence the decision of a LGA department about sharing sensitive and confidential information with different department(s).

The researcher attempted to further extend the research by identifying different phases of information sharing in LGAs in Section 3.3. It was argued that participation and adoption of information sharing in inter-departmental collaboration, similar to any other innovation adoption, may consist of a sequence of stages that departments go through while sharing information. Moreover, to improve the decision-making process in local authorities, it was discussed that it would be vital to map the influential factors on the participation phases (Section 3.4). Several theorised conceptions of prioritisation of factors have been discussed

in Section 3.5 so as to rank the factors based on their importance. Finally, it was suggested that for a better understanding of EIS in local government authorities, the four approaches (factors, participation phases, mapping the factors on the phases and prioritising the importance of factors on the participation phases) should be examined jointly (Figure 3-6).

In the next Chapter – Chapter 4 – the research methodology used to assess the proposed conceptual framework will be presented.

Chapter 4 – Research Methodology

4.1 Introduction

Research methods are the basis of knowledge creation in any given field. Benbasat and Weber state that “*research methods shape the language we use to describe the world and language shapes how we think about the world*” (1996). Different trends in research topics and the nature of research problems have led to a wider diversity in research method. Robey (1996) states that several evidence such as the variety of topics being addressed and the number of theoretical areas being referenced can indicate the diversity in Information System (IS) research. Moreover, as IS is a multi-disciplinary field in which many of its aspects are related to specialised subjects, identifying an appropriate research approach is not a straightforward task. The reason is that there is a plethora of methodologies that can be selected, or what Robey (1996) called “*methodological pluralism*”, in order to address specific issues within the discipline.

The next section presents different IS research paradigms and explains their major differences. By doing so, the basis for justifying the choice of interpretive research for this thesis will be underlined.

4.1.1 Underlying Research Paradigms

Selecting an appropriate research paradigm should be seen as the researcher’s personalised decision that influence the selection and application of the research method. Several research paradigms are available in IS research. Orlikowski and Baroudi (1991) suggested three underlying paradigms drawn from Chua’s (1986) classification of “research epistemologies” that can be summarised as follows:

- **Positive Research** is based on the existence of a fixed relationship within phenomena which is typically investigated with structured instrumentation (Orlikowski and Baroudi, 1991). Largely, these studies are conducted to validate a theory and to increase the understanding of a phenomena through formal propositions, quantifiable measures of variables and hypothesis testing (ibid). Positive studies assume that human action is rational and observation of the under-investigated phenomena can be carried out objectively and rigorously (Galliers, 1991).

- **Interpretive Research** assumes that our knowledge of reality is shaped only through human constructions such as shared meaning, documents, tools and other artefacts (Klein and Myers, 1999). Hence, interpretivist researchers consider reality as subjective in which understanding any phenomenon relies on the researcher's beliefs and the interaction with the participants assigned to the phenomenon. Orlikowski and Baroudi (1991) stated that the intention of interpretive studies is to increase understanding of phenomena within their social and cultural context; the researcher does not impose any pre-defined boundary to the scope of the phenomenon and all the examinations should be carried out from the participants' perspective.
- **Critical Research** is concerned with evaluating existing social systems and identifying any contradictions that may inhere within the predefined structures (Orlikowski and Baroudi, 1991). Researchers who conduct critical research assume that social reality is historically established and that it is produced and reproduced by people. Based on this philosophy, any social systems are under constant change. Cecez-Kecmanovic and Klein (2008) reported that critical researchers try to comprehend "*how IS serve particular interests, by developing a situated understanding of positions and experiences of people affected by the systems and by linking such understandings with broader conditions*" (Cecez-Kecmanovic et al., 2008).

A summary of research paradigms in information system research is provided in the following table, i.e. Table 4-1.

Based on the established distinction amongst the research paradigms in information systems and the nature of the objective of this research, interpretivism is believed to be the most appropriate paradigm. In the next section, an in-depth justification of why this paradigm is selected will be provided.

Basic Beliefs	Research Paradigms		
	<i>Positivist</i>	<i>Interpretivist</i>	<i>Critical</i>
<i>Ontology</i>	A single reality, researcher and reality are separate.	Multiple realities, researcher and reality are inseparable.	Reality is historically constituted, researcher and reality are inseparable.
<i>Epistemology</i>	Objective, the reality exists beyond the human mind.	Subjective, knowledge of reality is created through human experiences.	Reality is shaped by its own social context, iterative circumscription reveals meaning.
<i>Methodology</i>	Observation, mainly quantitative, experimental, statistical evaluation.	Participation, mainly qualitative, hermeneutical.	Assumptions, process of producing and reproducing values and beliefs.
<i>Interaction of Knowledge and Practice</i>	The phenomena under investigation cannot be changed by the researcher, no subjective opinion is concerned.	Direct interfere with the phenomena by the researcher, subjective views by the researcher are concerned.	Interfere with the phenomena by the researcher, as well as seeking to alter the current social status.

Table 4-1: Summary of Research Paradigms (Adapted from (Weber, 2004))

4.1.2 Selecting Interpretive Research

Diversity in research paradigms and, in some cases, blurred boundaries between the assumptions would result in challenges when selecting the most appropriate approach. As emphasised by Orlikowski and Baroudi (1991), knowledge about the paradigms and clear understanding of the research objective is the initial step for an IS study. The main objective of this research is to investigate the factors influencing Electronic Information Sharing (EIS) in inter-departmental collaboration in Local Government Authorities (LGA). This objective will be tackled by understanding the social, organisational, technological and departmental environments surrounding the effort of EIS in LGAs.

Seeking to gather and examine findings about the impacts of factors on the decision-making process for sharing information leads to an analytical study. The investigation is eventually concerned with the socio-political / socio-technological settings that shape the entire process of decision-making. In this context, the influences should be viewed at different levels (i.e., Central Government, the entire LGA and the departments within the LGA) with respect to the actors and stakeholders who make the decision and/or are involved in the associated actions after the decision is made. Through an interpretive approach, understanding of the

nature of each context presented in Section 3.2 as well as complexity of human sense making as the situation emerges would be enhanced.

The impacts of organisational factors (identified in section 3.2.2) are subject to interpretation of the new situations when working in a single department is transformed to working in a network of departments. Moreover, after the effort of EIS among different departments begins, the meaning of some of the factors such as business processes and trust will be changed and cannot be analysed on their routine establishment. For instance, each department within LGAs establish their own business processes whereas when the information sharing through IOS starts to take place within several departments, those business processes required to be reengineered.

Therefore, it is not possible to conduct this research without establishing a close interaction with the participants and attempting to interpret their subjective understanding of different circumstances under which information should or should not be shared in an electronic manner. This close interaction with the participants while they are making decisions allows the researcher to contribute to the participants' understanding with his own views and opinion. Nevertheless, the close involvement with the phenomena and the stakeholders should not dictate the researcher to change those settings and situations; this perhaps can be an objective for an action research study.

Based on the above discussion, for the scope of this study, an interpretive approach is deemed to be the most fitting choice. The way in which this research analyses the factors that influence decision-making about sharing information will be characterised by an interpretive tradition where it attempts to emphasise the processes, decisions and meanings collectively constructed and commonly shared by department employees involve in the effort of EIS. The study endeavours to gain a deep understanding of several phases that each LGA department experiences prior to sharing information. Therefore, the research adopts a methodology that enables an interpretation of the socially constructed situations that influence the stakeholders' decision-making process.

Whilst this section attempted to justify the selection of the interpretive research paradigm, the next section explains the nature of qualitative research in order to justify its significance to this study.

4.2 Justifying the Use of Qualitative Research

Research methods in information systems can be classified in several ways; however, one of the most common distinctions is between qualitative and quantitative research methods (Myers and Avison, 2002). *Quantitative research methods* are historically developed in natural sciences (Myers and Avison, 2002) and characterised in order to analyse hypotheses that are tested through controlled experiments or statistical analyses (Kaplan and Duchon, 1988). These methods are typically applied to answer questions about the relationship between calculated variables in order to explain the phenomenon in-depth (Leedy and Ormrod, 2005). Survey methods, laboratory experiments and numerical methods are some examples of quantitative methods.

Qualitative research methods, on the other hand, are originally developed in social sciences in order to study social and cultural phenomena (Myers and Avison, 2002). It can be considered that qualitative methods are designed to assist researchers understand social and cultural contexts through analysing qualitative data gathered from interviews and questionnaires, observations and participations and documents and text.

Some of the aspects and differences between these two methods are summarised in Table 4-2.

<i>Criteria</i>	<i>Qualitative Research Methods</i>	<i>Quantitative Research Methods</i>
Purpose	To understand and interpret social interactions.	To test hypotheses, look at cause and effect, make predictions.
Sample of Study	Small, not randomly selected.	Large, randomly selected.
Forms of Data Collected	Qualitative data such as open-ended responses, interviews, participant observations.	Quantitative data through precise measurements using structured data collection instruments.
Expected Results	Specialised findings that is less generalisable.	Generalisable results that can be applied to other cases.
Final Report	Narrative report with contextual description and direct quotations from the participants.	Statistical report with correlations and statistical significance of findings.

Table 4-2: Qualitative VS Quantitative Research Methods
(Adapted from Hair *et al.*, 2011; Johnson and Onwuegbuzie, 2004)

Occasionally the term “qualitative research” is, by mistake, used interchangeably with “interpretive research”. Walsham (2006) differentiated between these two terms and

emphasised that in some cases quantitative data (i.e., from survey, etc.) are perfectly valid inputs for an interpretive study. Myers(1997) also supported that qualitative research may or may not be interpretive and underlined that this type of research can be positivist, interpretivist or critical depending on the researcher’s philosophical assumption. Other than this view, some scholars (e.g. Kaplan and Maxwell, 2005; Maxwell, 2005; Lee, 1991) argue that most of the time qualitative research methods are described by their interpretive perspective since the goals of this method typically involve analysing a phenomenon from the participants’ points of view and in its particular social and institutional context. Table 4-3 summarises some aspects of qualitative research in terms of its strengths and weaknesses.

Strengths of Qualitative Methods	References
Gaining in-depth understanding of phenomena by the researcher	(Silverman, 2010; Benbasat and Zmud, 1999)
Allowing researcher to study IS in its natural setting	(Kaplan and Maxwell, 2005; Myers and Avison, 2002)
Allowing researcher to generate theories from practice	(Myers, 1997; Miles and Huberman, 1994)
Allowing researcher to study dynamic processes	(Johnson and Onwuegbuzie, 2004)
Weaknesses of Qualitative Methods	References
Different ways of interpreting data	(Silverman, 2010)
Small sample which may reduce the generalisability	(Hair <i>et al.</i> , 2011; Saunders <i>et al.</i> , 2009)
Time consuming in terms of data collection and data analyses	(Silverman, 2010; Miles and Huberman, 1994)
The result may be influenced by the researcher’s personal biases	(Johnson and Onwuegbuzie, 2004)

Table 4-3: Strengths and Weaknesses of Qualitative Research Methods

The qualitative research approach is selected for this thesis since it enables the researcher to understand and examine the phenomenon (i.e., EIS participation in LGAs) in its natural settings where several social, organisational and technological factors are influential. Inter-departmental collaboration, in general and information sharing in such collaborations, in particular, are relatively new concepts in the public sector especially at a local level. Strauss and Corbin (1990) stated that qualitative research methods can be used to first, better analyse a phenomena that is yet little acknowledged, second, to gain a new perspectives of an event which is already known and third, achieve in-depth information that maybe difficult to study

quantitatively. Therefore, qualitative research methods seem to be more appropriate in this research compared to quantitative ones.

There are four main reasons (Adopted from Kaplan and Maxwell, 2005) for adopting qualitative methods in this research:

1. *Understanding the Participants' Perspective:* Perceptions and perspectives of the participants in IOS are not known in advance. The reason is that the nature of network collaboration and the way that different parties are getting along is unpredictable since several variables such as trust and dependence are involved (Mazen *et al.*, 2011). It would be difficult to ascertain or examine these through purely quantitative approaches. Qualitative methods can contribute to the explanation of users' behaviour with respect to the system, hence the success and failure of the system.
2. *Understanding the Social and Organisational Context:* The main purpose of this research is to examine the effort of EIS in local authorities with a socio-technical perspective. Adopting such effort in public sector organisations cannot be analysed without considering the political, organisational and technological context. Hence, because of the "context", EIS initiatives are not the same when carried out in different settings. By selecting a qualitative method the researcher would be able to build a close relationship with the organisation under investigation and this would result in better understanding of those influential contexts.
3. *Understanding the Causal Processes:* As discussed in Section 3.2, there is a causal relationship between each factor group influencing the decision-making process over EIS. This can be interpreted as the dynamic interaction between the organisation's actions and change processes occurring during the effort of EIS. Maxwell (2004) argued that a quantitative method such as experimental intervention can prove that causal relationships exist, but they cannot effectively show *how* those causal processes work. Through a qualitative method, the researcher can explain the relationship among several variables influencing the outcome (Miles and Huberman, 1994) and demonstrate how and why such processes and outcome occur (Markus and Robey, 1988).
4. *Enhancing the Utilisation of the Results:* one of the main intentions of this research is to improve the effectiveness of decision-making processes for EIS in LGAs through

analysing and prioritising the factors influencing the effort. Patton (2002) emphasised that the findings of qualitative methods can enhance the credibility and usefulness of evaluations for decision-making processes. The reason is that the findings gathered through a qualitative approach are directly connected with the perceptions of the individuals and stakeholders.

To conclude this section, a qualitative approach will be adopted in this research as it attempts to understand and examine the factors influencing decision-making processes regarding EIS in LGAs. Hence, it can be argued that in-depth understanding of this effort requires a close interaction with the stakeholders who are actually involved in decision-making and this can be achieved through detailed interviews and observations. In the next section, selecting an appropriate research strategy will be explained and discussed.

4.3 Selecting an Appropriate Research Strategy

Research strategy can be viewed as the means of conducting research through employing different research methods for collecting and analysing data (Galliers, 1992). There are several different strategies available in order to conduct IS research including survey, experiment, ethnography, action research, grounded theory and case study (Saunders *et al.*, 2009). Several academics such as Silverman(2010), Yin (2003) and Benbasat *et al.*(1987) have clarified that each research strategy has its own advantages and disadvantages; and no strategy is superior or inferior to any other. Therefore, the importance of selecting a specific strategy relies on understanding whether or not that strategy is able to answer the research question(s) and meet the objectives. Yin (2003) stated that in order to decide which strategy is more appropriate for a certain research, three key criteria should be taken into account: (a) the type of research question, (b) the role of the researchers over the behavioural event and (c) the extent of focus on contemporary events compared to historical events.

The next section justifies a case study as an appropriate research strategy for the scope of this research and proves how this strategy enables the researcher to undertake this work through employing different data collection and analysis methods.

4.3.1 Justifying the Use of Case Study Research

Although there are several definitions of case study research exist in the literature, Robson

(2002) defined it as a “*strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon with its real life context*” (p.178). Yin (2003), also, described case study as a strategy that allows the researcher to investigate a current phenomenon within its natural setting when the boundaries between the phenomenon and its context are not clearly evident. It has been argued that case study research is the most broadly qualitative method selected in information systems research (Myers, 1997; Orlikowski and Baroudi, 1991) and is particularly well suited for understanding the interaction of ICT-related innovation and the organisational context (Darke *et al.*, 1998).

Taking into consideration the philosophical assumptions and methodological considerations discussed in the above sections, the case study approach for this research seems the most appropriate. The other main reasons are summarised as follow:

- *The nature of the research question(s) and objective(s)*: The first and most important principle for selecting a research strategy is to understand the nature of research question (Yin, 2003). As it is illustrated in Chapter 1, this research attempts to answer the question “What factors influence participation in inter-departmental EIS in LGAs?”. Moreover, as the objectives of this research, it is tried to understand how those factors influence the decision-making processes of departments within the authorities and why the decisions made differ in different LGAs while the type of implemented IOS and information involved are similar. Several academics (e.g., Saunders *et al.*, 2009; Yin, 2003; Benbasat *et al.*, 1987) stated that case study research has considerable ability to generate answers to ‘what?’, ‘how?’ and ‘why?’ questions and can assist researcher to understand the nature and complexity of the processes taking place.
- *Examining the phenomenon in its natural setting*: The purpose of this research is to understand and examine a phenomenon (i.e. effort of information sharing in LGAs) that is bounded by a socio-technical context and is more likely influenced by several environmental, organisational and technological factors. It attempts to create a narrative description of the processes in which LGA departments are passing through prior to share information electronically with their internal partner. Remenyi *et al.*, (1998) underlined that case studies approach are one of the most appropriate approaches to provide an explanation of the investigated phenomenon, and demonstrate understanding of the subject of investigation within its surrounding environment.

- Previously under-studied area:* As clarified in previous Chapters, there is limited research on EIS in inter-departmental collaboration at a local level. Pardo and Tayi (2007) stated that most of the previous studies on information sharing are focused on a specific domain (e.g. criminal justice and emergency response) and mainly analyse the phenomenon with a specific point of view (e.g. technological, business processes and political). It can be argued that the effort of EIS has not been widely investigated in LGAs and there is very limited research examining decision-making processes with regards to sharing information in a networked collaboration environment. Benbasat (1987) stated that the case study approach is appropriate in areas in which few studies have been carried out previously.
- Comparing with other related strategies:* To place case study in perspective and justify this strategy as the most appropriate way of conducting this research, it is useful to compare this strategy with other related strategy commonly used in the field of IS (Benbasat *et al.*, 1987). For example, *Action Research* is useful for research that requires specific knowledge on a specific problem within a specific situation and is often used as the problem solving strategy (Silverman, 2010). The researcher does not define the problem and neither is a participant in the development and implementation of a system. Also, in the scope of this research, the researcher was not involved in the adoption and implementation processes of IOS in LGAs and would not be able to interfere and influence the decision-making processes. Therefore, it made little sense to apply this method in this thesis. The appropriateness of case study research strategy over other related strategies are summarised in Table 4-4.

	Case Study	Field Studies	Action Research	Application Description	Ethnography
Aims for understanding of context	✓		✓	✓	✓
Does not pre-define a construct/problem	✓		✓	✓	✓
Topic defined by researcher	✓	✓		✓	✓
No intent of interference in phenomenon	✓	✓		✓	✓
Attempts to contribute to knowledge	✓	✓	✓		✓
Relates findings to generalizable theory	✓	✓	✓		
Interpretation from researcher's viewpoint	✓	✓	✓	✓	

Table 4-4: Comparing characteristics of Case Study Strategy with the Related Strategies
(Adapted from Cavaye, 1996)

Yin (2003) suggested that there are three types of case study investigations; descriptive, exploratory and explanatory. Descriptive cases require a descriptive theory to be developed prior to the start of the research, while the main aim of exploratory case research is to develop

pertinent hypotheses and propositions for future studies. On the other hand, explanatory case research attempts to first describe the events that took place and then present multiple theories to explain the course of events (Benbasat *et al.*, 1987). Several scholars stated that the way the research questions start (i.e., why, how, why questions) would direct for the selection of the appropriate case study approach.

Based on the above classifications, the case study followed in this research can be classified as *exploratory* case research. The reason is that this research addresses a particular new set of questions in public sector studies. Moreover, it attempts to answer questions with “What?” and “How?” forms (i.e., “What factors influence participation in inter-departmental EIS in LGAs?” and “How those factors influence the decision-making processes in LGAs?”).

Having justified the use of exploratory case study strategy in this research, it is now essential to decide whether single or multiple cases should be adopted in order to gain sufficient insight of the phenomenon. A single case study approach enables the researcher to examine a phenomenon in depth, get close to the phenomenon and describe and reveal its deep structure (Cavaye, 1996). Yin (2003) suggested that selecting a single case study is appropriate when:

1. It represents a *critical case* for testing a well-formulated theory (i.e., it meets all the requirements for testing a theory).
2. It represents an *extreme* or a *unique case*.
3. It is representative (i.e., capturing the circumstances and conditions of everyday or commonplace situation).
4. It is *revelatory* (i.e., investigating a phenomenon that was previously inaccessible)
5. It is *longitudinal* (i.e., investigating the same single case at two or more different time frame).

On the other hand, although a multiple case approach may not enable the same level of rich description compared to single case approach, it enables analysis of data across different cases and compare the results in diverse settings (Darke *et al.*, 1998). The evidence from multiple cases is often considered more convincing and the research can provide more robust investigation of causes and effects of the unit of analysis (Herriott and Firestone, 1983). Multiple cases may be selected to either (a) predict similar results (a literal replication) or (b) predict contrasting results but for predictable reasons (Yin, 2003).

In the light of the characteristics of this research, a multiple case study approach is more

appropriate to be adopted. Through conducting multiple case studies, the researcher aims to uncover different aspects of information sharing in local authorities, as well as examine different situations when inter-departmental collaboration is effective for successful information sharing. Moreover, this approach enables the researcher to identify whether the influential factors in different authorities are similar or different.

4.3.2 Overview of the Case Studies

As the main intention of this study is 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 the decision-making in 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, which have initiated the effort of EIS through developing and implementing IOS. *Secondly*, it has been tried to select one case in England, one in Wales and one in the capital London. As issues such as political views, finance, IT foundation and culture are different in these three areas, it would be interesting to compare how they react to the notion of EIS with similar organisational structures. *Lastly*, since this research focuses mainly on sharing *sensitive* information, not many LGAs were delighted to share their views, experiences and perhaps any tragic histories regarding the EIS. This has resulted in a limited number of organisations selected.

For confidentiality reasons coded-names as LGA_NW, LGA_SE and LGA_LON were employed for each of the case organisations. A brief summary of the selected LGAs and the EIS projects are presented below:

1. LGA_NW–Home-to-School Integrated System: LGA_NW is a UK unitary authority located in Wales that provides all major services such as education, social services, leisure, and planning and highways. The authority is in the process of transforming its information management first, by introducing a corporate Electronic Document and Records Management Systems (EDRMS) as the main hub of dispatching information across the council and second, through implementing several integrated systems as the key enablers of decision-making processes and contributors to effective service delivery through a high level of collaboration among its departments. Among many other services offered to the citizens, there is a unique service called Home-to-School that is primarily

provided by the Social Services Department. The main objectives of this service are to provide (a) daily transportation of any children across the county with special needs (e.g. disabled children, children living with single parents), (b) routine education support to children with dyslexia and (c) transporting those children to therapy centres based on their needs. Due to the nature of this service, a constant collaboration among several departments (e.g. Education Services Department, and Social Services Department) was inevitable. The status of the collaboration before and after the implementation of the project and different aspects of how it operates will be presented in-depth in the next Chapter.

2. LGA_SE – Integrated Children System (ICS): LGA_SE is a County Council located in the South East of England. The council is one of the largest councils in the country that serves about 1.6m people, covers an area of 1,679 sq/km and employs more than 26,000 staff providing a range of key public services, including among others education services, social case services, property, high-ways, planning and refuse collection. The council's Children, Schools and Families directorate is responsible for the social care and safeguarding of children and young people and has 700 social work practitioners in operation across the county. As part of the UK Government's major reform for children's services in England and Wales, LGA_SE developed the Integrated Children's System (ICS) to ensure that assessment, planning and decision making would lead to good outcomes for children in need and their families. The project was developed and piloted by a leading provider of collaborative software to the UK public sector in 2011. The key purpose of ICS was to provide frontline staff and managers with the necessary help, supported by an electronic case record system, to record, collate, analyse and output the information required. Several departments had to participate to feed (a) the primary information into the system in the first place and (b) case-based information throughout the service delivery. The structure of the inter-departmental collaboration and how the project was up and running will be presented in the next Chapter in detail.

3. LGA_LON – Front/Back Office Integration: Integrated Waste Management (IWM) System: LGA_LON is a London Borough located in the North West of the capital and serving a population of 240,000 people, 86,000 houses in an area of 53 sq/km. LGA_LON

and its third party partners started several organisational transformations in 2009 by setting out the appropriate technological developments to continue the trend of service delivery excellence. One of the inter-departmental projects awarded by the National Land and Property Gazetteer in 2010 was the Waste Management System. The issue was identified as the complaints about the waste collection doubled. Therefore, the Council decided to computerise the entire process through first, implementing a corporate-wide Electronic Document and Records Management System (EDRMS) and second, integrating the CRM System with several business application in Housing Department and Road and Transportation Department. The in-depth description on how the departments were collaborating to achieve the most efficient outcome will be presented in the next Chapter.

4.4 Empirical Research Process

The purpose of this section is to describe different stages of the empirical research carried out in this thesis. One way of thinking about the stages in empirical research is to visualise the process as the so-called “*research wheel*”, representing that research is not linear but a recursive cycle of steps over a period of time (Rudestam and Newton, 2007). Reviewing the normative literature indicates that the precise number of stages varies, but they similarly follow the perception of warming-up and preparation phase, stretching exercises and cooling down phase (Janesick, 2003). The research process adopted in this thesis is based on three phases developed by Jankowicz (2005): (1) research design, (2) data collection and (3) data analysis. These stages are depicted in Figure 4-1 and will be explained in detail in the next sections.

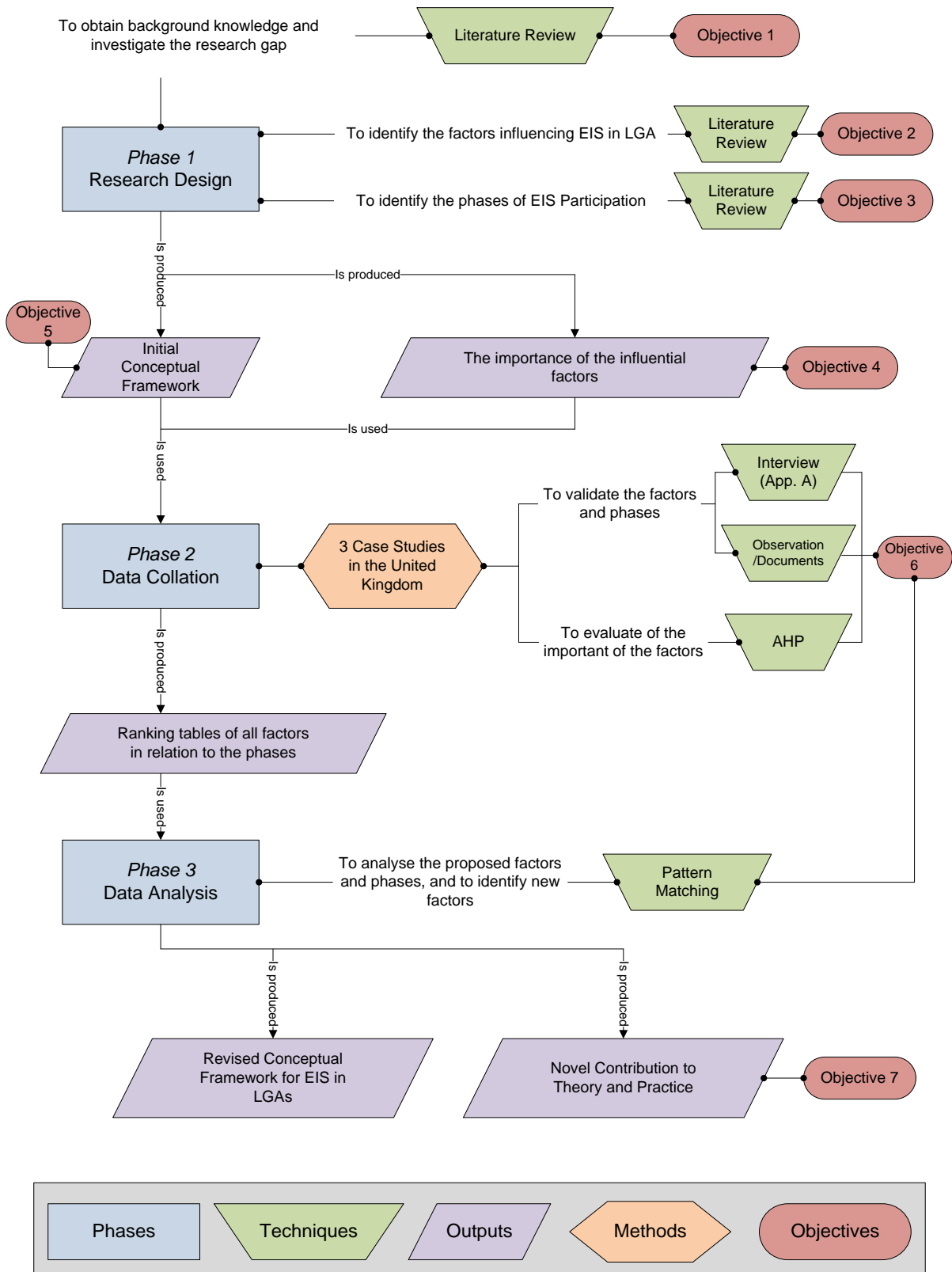


Figure 4-1: Empirical Research Framework

4.4.1 Research Design

The first phase of the process is the research design. As it is illustrated in Figure 4-1, this phase starts with obtaining research background on information sharing in inter-departmental collaboration in LGAs as well as describes the previous and current studies (in Chapter 2) to fulfil the first objective of this research. Thereafter, the need for developing a conceptual framework for EIS participation in LGAs was discussed in Chapter 3. Through comprehensive literature review on interdepartmental collaboration, information sharing and inter-organisational systems adoption in public sector, the initial factors and phases of EIS participation were proposed (addressing objectives 2 and 3). The main output of this phase is the conceptual framework (Figure 3-6) that represents the factors influencing EIS participation and the phases that the department adopt while sharing information.

The next sections explain how the data was collected through the interviews and several other sources such as the UK Government archival documents, consultancy reports and documents from the service providers to the LGAs.

4.4.2 Data Collection

The second phase of the process adopted in this research is Data Collection. The method selected to conduct this phase is Case Study (justified in Section 4.3.1). In a case study research, data can be typically collected through six different sources: documentation, archival records, interviews, direct observation, participant-observation and physical artifacts (Yin, 2003). Table 4-5 summarises the main sources of data collection and their strengths and weaknesses. It can be seen that no single source has a complete advantage over others. Collecting data through different sources enables the researcher to achieve a broader picture of the phenomenon under investigation and address a broader range of attitudinal and behavioural issues (Paré, 2004). Yin (2003) also stated the “*use of multiple sources of evidence*” as the foremost principle of data collection in case study research (p. 97). Based on the scope of this study, the researcher suggests *interviews* in conjunction with the use of *documentation* as the most appropriate sources of data.

Source of Evidence	Strengths	Weaknesses
Documentation	<ul style="list-style-type: none"> • Stable; reviewed repeatedly • Unobtrusive; not created as a result of the case study • Exact; contain exact details • Broad coverage; long span of time 	<ul style="list-style-type: none"> • Low retrievability • Biased selectivity • Access; may deliberately blocked
Archival Records	<ul style="list-style-type: none"> • [Same as above for documentation] • Precise and quantitative 	<ul style="list-style-type: none"> • [Same as above for documentation] • Accessibility due to privacy reasons
Interviews	<ul style="list-style-type: none"> • Targeted; focuses directly on case study topic • Insightful; provide perceived causal inferences 	<ul style="list-style-type: none"> • Bias due to poorly constructed questions • Response bias • Inaccuracies due to poor recall • Reflexivity; interviewee gives what interviewer wants to hear
Direct Observations	<ul style="list-style-type: none"> • Reality; covers events in real time • Contextual; covers the context of event 	<ul style="list-style-type: none"> • Time-consuming • Selectivity; unless broad coverage • Reflexivity; events may proceed differently as it is being observed • Cost; hours needed by human observation
Participant-Observations	<ul style="list-style-type: none"> • [Same as above for direct observation] • Insightful into interpersonal behaviour and motives 	<ul style="list-style-type: none"> • [Same as above for direct observation] • Bias due to investigator's manipulation of events
Physical Artifacts	<ul style="list-style-type: none"> • Insightful into cultural features • Insightful into technical operations 	<ul style="list-style-type: none"> • Availability • Selectivity

Table 4-5: Sources of Evidence in Case Research: Strengths and Weaknesses
(Adapted from Yin, 2003)

Interviews

According to Myers and Newman (2007), interview is one of the most important data gathering techniques in qualitative research. Yin (2003) also regards it as the foremost sources of information in case study based research.

There are several ways that qualitative interviews can be structured. According to Saunders *et al.* (2009) these types can be summarised as: (a) *Structured interviews* that contain a complete script and have less flexibility for improvisation, (b) *Semi-structured interviews* in which the researcher prepares some questions prior to the interview, but there is a need for improvisations and (c) *Unstructured interviews* that are informal and general conversations

between the interviewer and participants regarding the phenomenon under investigation.

For the purpose of this study, semi-structured interview was utilised as the main data collection technique. Prior to the interviews, some structured questions to be used as the interview agenda and some open ended questions were prepared. All the structured questions were based on the group factors identified in Section 3.2, EIS participation phases presented in Section 3.3 and mapping and prioritisation of the factors presented in Sections 3.4 and 3.5. Open ended questions were asked to identify new factor(s) and uncover new situations influencing EIS. The main reason for selecting semi-structured interview was the greater flexibility compared to other types of interviews in which the researcher could explore new factors, gaps and situations influencing EIS that were not identified in the structured question.

The interview agenda was reviewed by two senior officials from Socitm (The Association for ICT Professionals working in Local Authorities in the UK) in order to (a) obtain some ideas about potential authorities to be selected as the case organisations, (b) acquire suggestions about the potential interviewees who can answer the questions effectively to therefore meet the objectives of the study, (c) reword questions in order to collect the most relevant data within a short time of the interviews and (d) revise questions to be more aligned with the knowledge of potential interviewees in the selected organisations.

Based on the above feedback, four senior managers all of whom have been directly involved in inter-departmental collaboration and EIS in their organisations were selected. The departments and positions are summarised in Table 4-6. The availability of the participants was a problem and therefore the time for the interviews was quite limited. Each interview was conducted separately through a face-to-face meeting and lasted about 120 – 150 minutes each. In order to save time, all of the interviews were tape-recorded, intensive notes were taken during the interviews and transcripts were prepared soon after the interviews.

Organisation	Department	Positions
LGA_NW	• Information Technology Dep.	➤ Head of IT (HIT)
	• Customer Services Department	➤ Information Systems Manager (ISM)
	• Education Services Department	➤ Project Management (PM)
	• Social Services Department	➤ Principal Team Leader (PTL)
LGA_SE	• Information Technology (ICT)	➤ Information Sharing Officer (ISO)
	• Social Services Department	➤ Project Management (SSPM)

LGA_LON	• Housing Services Department	➤ Services Support Manager (HSSM)
	• Education Services Department	➤ Record Manager (ERM)
	• Information Technology Dep.	➤ Data Services Manager (DSM)
	• Transport Services Department	➤ Street Services Manager (TSM)
	• Housing Services Department	➤ Housing Services Manager (HSM)
	• Planning Services Department	➤ Planning Services Manager (PSM)

Table 4-6: Details of the Interviewees

The data collection period for this study spans over 21 months, as illustrated in Figure 4-2, from September 2010 to June 2012. This period has been divided into three main stages:

- 1- Preparation Stage: Finalising the interview questions, acquiring Ethical Approval, collecting case documents from the authorities, etc.
- 2- Data Collection Stage: Face-to-Face interviews.
- 3- Follow-up Stage: extra meetings, presenting some of the results to the entire organisation in order to obtain feedback.
- 4- Revision Phase: check the final results with the participants for the final validity.

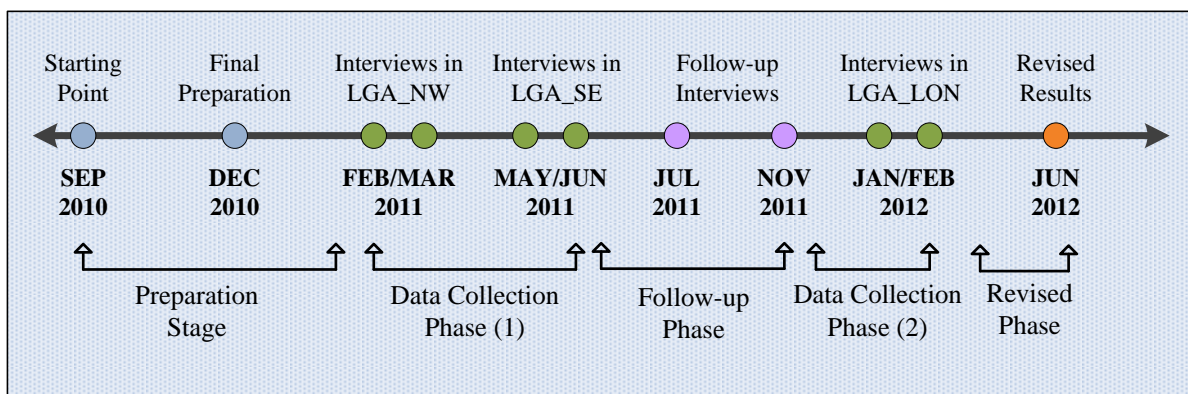


Figure 4-2: Time Frame of the Interviews

The interview agenda (for details see Appendix A) mainly focuses on data collection in relation to the following areas:

- **Section A – General Interview Information:** This section covers the general questions regarding the interviewee details such as their name, contact details and position. Due to ethical matter, just the position of the interviewees (clarified in Table 4-6) will be mentioned in case of any direct quote in the analysis of the case studies.

- **Section B – General Questions about the LGA Background:** This section attempts to gather general information regarding the LGA under study including information about the type of the authority, the status of the department within the LGA and the number of citizens who are served by the LGA.
- **Section C – Discussion on the Factors Influencing EIS in LGAs:** This section mainly focuses on collecting data regarding each factor presented in Section 3.2 in order to justify whether the factors are influential and if so, how they influence the decision on EIS in the authority. Also, it focuses on identifying new factors based on the interviewees' point of view.
- **Section D – Discussion on EIS Participation Phases:** This section aims at collecting data regarding the five major lifecycle phases (presented in section 3.3) that each department tends to adopt in order to decide whether or not to share information.
- **Section E – Discussion of the prioritisation of Factors and their mapping to EIS Phases:** In this section, the interviewees were asked to indicate which factor would be influential in each lifecycle phase. Moreover, data regarding the prioritisation of the factors in relation to the EIS phases were collected.

In the previous Chapter, the importance of the prioritisation of factors influencing EIS was investigated and presented. In this section, an appropriate technique that may assist the prioritisation of the factors on different stages of EIS participation will be identified. As the decision-making process for IS projects becomes more complex, several multivariate techniques have been developed to classify the importance of the influential factors. Determining the importance of the critical success/failure factors enables organisations to develop priorities when they plan to establish or improve their IS (Lam and Chin, 2005).

Data Envelopment Analysis (DEA) can be considered as an example of multivariate techniques. DEA measures the efficiency rate by the ratio of a weighted sum of outputs over a weighted sum of inputs (Salmeron and Herrero, 2005). The weights or importance given to each of the criteria can take any value and none of them can be considered more important

than any other. However, this method is more appropriate when the decision makers have no clear preferences on different factors, or when the interest is focused mainly on selecting the technology that performs better independent of any personal preferences (ibid).

Simple Multi Attribute Rating Technique (SMART) can also be selected to rank criteria that involve multi-criteria decision making (Dutta and Burgess, 2003; Edwards, 1977). The common procedure in this technique is to first identify the factor which is weighted most highly and second assess other criteria relative to that one (Belton, 1986). The assessment of this technique, as with DEA, illustrates that it does not incorporate the preferences structure of the decision makers, that is to report the perception of the decision makers about a single or number of factors.

Additional techniques were also reviewed, for example the Ranking Approach (Buss, 1983) and Analytical Network Process (ANP) (Lee and Kim, 2000). However, the appropriateness and applicability of these techniques for the research presented in this thesis is weakened since: (a) they involve quite complex mathematical models and extensive calculations, (b) most of the factors presented in this study are not quantifiable and (c) it is not easy for the managers in the public sector to fully understand the concept behind these approaches. In contrast, Analytical Hierarchy Process (AHP) allows decision makers to express their individual preferences (Salmeron and Herrero, 2005) and supports them not only by enabling them to model a complex problem and exercise judgement, but also by allowing them to incorporate both objective and subjective consideration in decision-making process (Forman and Selly, 2001). Through reviewing literature on the aforementioned techniques, Table 4-7 summarises the characteristics of AHP, SMART, DEA, RA and ANP.

AHP was developed at Wharton School of Business by Saaty (1980). He believes that the most creative task in decision making is to select the factors that are influencing the decision, organise them in a hierarchical structure descending from an overall goal to criteria, sub-criteria and alternatives in successive levels (Saaty, 1990). AHP is a powerful and flexible decision-making technique to examine a complex decision problem through its decomposition into several smaller attributes as well as set priorities among them (Salmeron and Herrero, 2005). It allows each decision maker to choose which specific factor is more important over other.

Characteristics of Identified Prioritisation Techniques	Techniques				
	AHP	SMART	DEA	RA	ANP
Incorporation of preference structure	✓	–	–	–	–
Synthesised analysis of diverse judgements	✓	–	–	–	–
Optimising resource allocation for interaction of factors	✓	–	✓	–	✓
Limited attributes to carry out real world decisions	–	✓	✓	✓	✓
Captures individual knowledge and experience	✓	–	–	–	–
Gives easy understanding of problem situation	✓	–	–	–	✓
Time-consuming process	✓	✓	–	–	–
Managing large amount of qualitative/quantitative data	✓	✓	–	–	–
Applicability weakened by complex mathematical models	–	–	–	✓	✓
Easy understanding of the prioritisation process	✓	✓	–	✓	–
Quick insight into structure of information	✓	✓	–	–	–
Measure the performance efficiency of decision makers	–	✓	✓	–	–
Structures through symbolic and numeric representation	✓	✓	–	–	–
focus mainly on quantifiable calculations	–	✓	✓	✓	✓
Providing a step-wise guideline for prioritising the factors	✓	–	–	–	✓

Table 4-7: Characteristics of Prioritisations Techniques (Adapted from Kamal, 2008)

AHP has been widely applied in the field of Information Systems (e.g. Lam and Chin, 2005; Khoo *et al.*, 2002; Yang and Huang, 2000) in order to illustrate the importance of several factors influencing the decision-making process. It employs both qualitative and quantitative approaches to examine and solve decision problems (Cheng and Li, 2001). It uses a qualitative way to decompose an unstructured and complex decision problem into a systematic decision hierarchy. Also, from a quantitative perspective, it adopts pair-wise comparisons to rate and prioritise the decision elements (i.e., factors).

Nevertheless, to the researcher's knowledge, there is no literature that presents a formal technique to rank and prioritise factors influencing decision-making on neither adopting IOS nor EIS in LGAs. Although in the previous studies on EIS in the public sector (e.g. Ali *et al.*, 2011; Akbulut *et al.*, 2009; Fedorowicz *et al.*, 2007; Pardo and Tayi, 2007) several factors

have been proposed, none of them have actually ranked and prioritised the importance of the factors. In this research, prioritising the factors influencing EIS in LGAs has been considered as a researcher proposition that results in a contribution to the field. In addition to the characteristics of AHP are presented in Table 4-7; several other reasons why the researcher proposes AHP as the most appropriate approach to address this proposition are summarised as follows:

- The interviewees have been selected from four different departments involved in the effort of EIS in the selected LGAs in which they have different views and arguments about sharing information. AHP allows synthesising and analysing diverse judgements and decisions (Lam and Chin, 2005) by employing redundant comparison.
- The research attempts to interpret the views of the key stakeholders in EIS and analyse different circumstances when they make decisions about sharing information. In this sense, AHP allows the participant to express their individual preferences of different factors influencing the decision making process.
- Understanding the concept of AHP for the public sector managers is easier compare to other techniques as first, it decomposes the main decision problem into several sub-attributes and second, it provides a detailed stepwise comparison mechanism with fewer mathematical calculations.

The AHP technique encompasses a four-step process (Lam and Chin, 2005): *firstly*, the decision problem should be broken down into a hierarchy of smaller and interrelated elements; *secondly*, the data regarding each element in the hierarchy should be collected through pairwise comparison; *thirdly*, based on the pairwise comparison matrices, the consistency ratio to normalise the judgments should be checked and *lastly*, the eigenvalue of each matrix should be calculated in order to reflect which element or factor dominates another. The way in which these steps have been applied is described below.

- **Step 1 –Constructing the Hierarchy Model:** Based on the conceptual framework of EIS participation in LGAs, the hierarchy structure of the factors influencing the effort of EIS is formed and illustrated in Figure 4-3. The top level reflects the objective that is EIS Participation in LGAs. The factors and elements affecting this objective are categorised

into an intermediate level: (1) *External Environment (EE)*: Political Pressure (PP) – Economic Pressure (EP) – Legislation and Policy (L&P) – Community Pressure (CP), (2) *Capacity of Organisation (COP)*: Inter-Organisational Leadership (IOL) – Return on Investment (ROI) – Collaboration Culture (CC) – Organisation Size (OS), (3) *Technology Environment (TE)*: IT Capability (ITC) – Data Security and Privacy (DS&P) – Information Quality (IQ) – Interoperability Framework (IF), (4) *EIS Characteristic (EIS)*: Cost of Sharing Information (CEIS) – Benefits of Information Sharing (BEIS) – Risk of Sharing Information (REIS). (5) *Inter-departmental Environment (IDE)*: Business Process Compatibility (BPC) – Inter-departmental Trust (IDT) – Critical Mass (CM). Moreover, four phases of EIS participation are considered as sub-criteria at the lowest level.

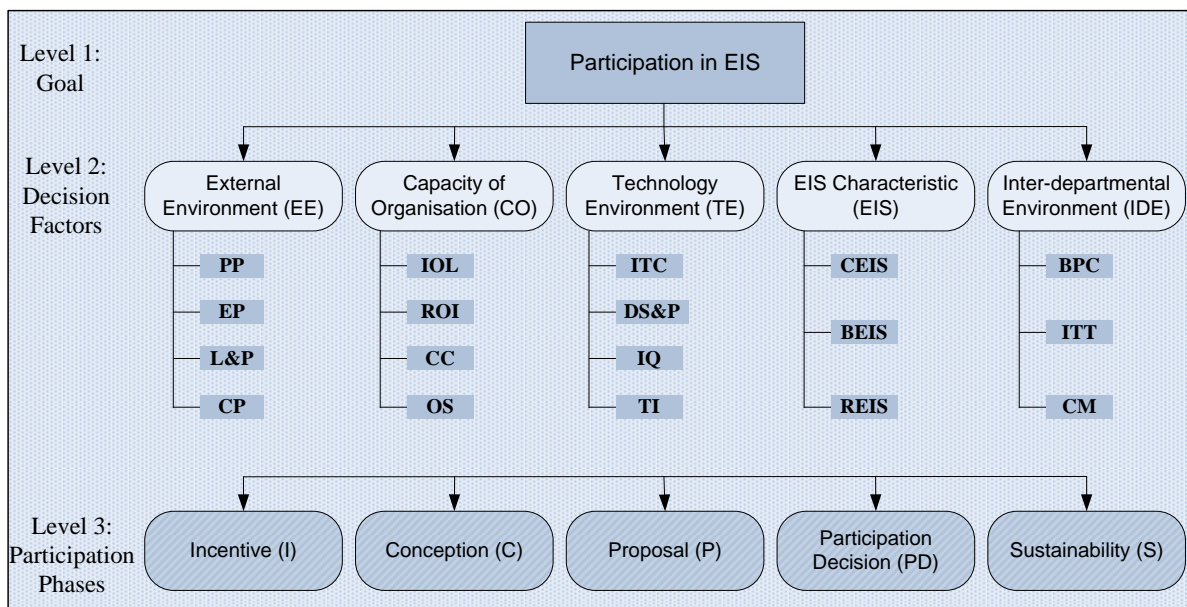


Figure 4-3: EIS Participation Factors Hierarchy

- **Step 2 – Data Collection by Pair-wise Comparisons:** Yang and Huang (2000) suggested that three phases can be carried out in this step: (1) the computation of the different weights by asking the importance of each factor with respect to each of the others through pairwise comparison, (2) the computation of a vector of priorities, and (3) measurement of consistency. There are several ways that the pairwise comparison can be carried out. The selection depends on the trust of the decision-makers in the consistency of the data collected through interviews (Salmeron and Herrero, 2005). In this research, the widely accepted nine-point scale suggested by Saaty (1980) to conduct a pairwise comparison of factors is selected. The meaning of each point on the scale is illustrated in Table 4-8.

During the interviews, each interviewee was asked to provide a rate, w_{ab} , regarding the importance of a factor, A, compared to the importance of another factor, B, in the same category. Then, for the reciprocal comparison, the rate of the importance of the factor B over A is deducted from the previous one and is given by $1/w_{ab}$. For example, if B is moderately to strongly preferred over A (Scale 4), we will rate the importance of A over B as $1/4$. This approach reduces the number of comparisons for the interviews to $n(n - 1)/2$ in which n is the number of factors in the category. This procedure of pairwise comparison carried out in this section follows the one suggested by Salmeron and Herrero (2005). With this procedure, there are no symmetric inconsistencies. The importance of factor B over A will always be consistent with the importance of A over B. However, the importance of A over B may not be consistent with the importance of A over C and C over B. Therefore, consistency of judgements is checked and analysed in Step 3.

<i>Numerical Rating</i>	<i>Verbal Judgments of Preferences</i>
1	A is equally preferred over B
2	A is equally to moderately preferred over B
3	A is moderately preferred over B
4	A is moderately to strongly preferred over B
5	A is strongly preferred over B
6	A is strongly to very strongly preferred over B
7	A is very strongly preferred over B
8	A is strongly to very extremely preferred over B
9	A is extremely preferred over B

Table 4-8: AHP Scale for Pairwise Comparison (Saaty, 1980)

The numerical values of the judgements of the pairwise comparison are set to be put in the upper triangle of the square matrix. As an example, a_{ij} represents how much factor i is preferred over factor j that means: $a_{ij} = w_i/w_j$. The values of the main diagonal are all equal to 1 and the values of the lower triangle of the matrix are the inverse of the upper triangle (i.e. $a_{ji} = 1 / a_{ij} = 1 / (w_i/w_j) = w_j/w_i$). Therefore the matrix becomes:

$$A = (a_{ij}), (i, j = 1, \dots, n):$$

$$A = \begin{pmatrix} 1 & \cdots & a_{ij} \\ \vdots & 1 & \vdots \\ 1/a_{ij} & \cdots & 1 \end{pmatrix};$$

That is:

$$A = \begin{pmatrix} 1 & \cdots & w_i/w_j \\ \vdots & 1 & \vdots \\ w_j/w_i & \cdots & 1 \end{pmatrix}$$

These weights can be considered as the local weights (Salmeron and Herrero, 2005) or the weights within the category of factors they belong to and if there is an upper category, then the absolute weights are given by multiplying the weight of the factors above by the local weights.

- Step 3 – Checking the Consistency of the Judgements:** As the answers by the interviewees may be inconsistent, with this step, based on the pairwise comparisons, the Consistency Ratio (CR) should be checked. In order to do so, Expert Choice (EC), which is an AHP-based multi-objective decision support software, is selected. EC is designed for examining and validating decisions with complex structure and it has been widely applied to compute the results of AHP (e.g. Lam and Chin, 2005; Forman and Selly, 2001). The answers are consistent if the equality of $a_{ij} \cdot a_{jk} = a_{ik}$ holds for all factors. This means the preference of factor A over B is equal to the preference of factor A over C times the preference of C over B. Breaking this equality means that the interviewees are not consistent with their statements. In this situation, the answer of the interviewee is either eliminated from the dataset or the question regarding the factor involved in the equality should be asked again. Saaty (1990) has set the acceptable CR values for different matrices' size as 0.5 for 3-by-3 matrices, 0.08 for 4-by-4 matrices and 0.1 for larger matrices.
- Step 4 – Calculating the Weights of the Factors:** In the last step, the relative weights of those factors with an acceptable degree of consistency are calculated. Same as in the last step, EC software is used for the final calculation in order to identify which factor is more important than the others in the same category. The relative importance of EIS factors will be presented and analysed in the following Chapters.

Documentation

In addition to the interviews, documentation as a complementary approach was used to obtain background information about IOS projects and EIS efforts in local authorities in the UK. Because of their overall values, documents play a crucial role in any data collection in doing case studies (Yin, 2003). Additional information collected through documents is considered as supplementary information that in some cases may highlight new insight and areas that need to be investigated further (Saunders *et al.*, 2009). Denscombe (2007) stated the ease of access, cost-effectiveness and permanence of data as the main strengths of documentation, however, researchers should be cautious about the credibility of the sources, the purpose and social constructions of documents. The type of documents used in this research, the references and the purposes of selecting them are summarised in Table 4-9.

Type of Documents	Source	Purposes
Central Government Official Reports	UK House of Commons	<ul style="list-style-type: none"> • Official vision statement on using IT in public sector • Government ICT strategies • Strategic objectives for inter-organisational collaboration • Priorities of IT projects • Policies towards Local Authorities
	Ministry of Justice	<ul style="list-style-type: none"> • Data Sharing guidelines • Overview of existing legal frameworks • Guidance on Information Assurance • Information Security protocols
	HM Treasury	<ul style="list-style-type: none"> • Details of Spending cuts • Details of IT-related project budgets
Local Government Official Reports	Local Government Association	<ul style="list-style-type: none"> • Background of LGA's organisational structure • Framework for multi-agency environment • Data handling guidelines • Information sharing protocols • Influences of spending cuts on IT projects at local level
	SOCITM	<ul style="list-style-type: none"> • Governance of citizen's access • Implementing ICT governance at local level • Information management guidelines • Practical guide for local public services delivery
Project Specifications	LGAs' ICT Providers	<ul style="list-style-type: none"> • Technical specification on IOS projects • White papers on previous and current status of EIS in LGAs

Table 4-9:Types, Sources and Purpose of Documents

4.4.3 Data Analysis

The third and last phase adopted in this thesis is Data Analysis. Data analysis involves examining, categorising, tabulating, testing, or otherwise recombining the collected data for the purpose of finding answers to the research propositions (Yin, 2003). It has been argued that qualitative case data analysis is a complex task as the methods and approaches are often not well formulated (Miles and Huberman, 1994). Denscombe (2007) suggested four guiding principles that should be taken into consideration while qualitative data analysis is underway; *firstly*, the analysis of data and results drawn from the research should be firmly rooted in the data; *secondly*, the analysis should be seen as a process of interpretation in which the researcher produces meanings out of the raw data; *thirdly*, introducing unwarranted preconceptions and personal biases into the data analysis should be avoided; and *fourthly*, analysis should involve an iterative process in which comparing empirical data with the concepts developed in the research should be a constant task.

It should be emphasised that the foremost preparation for conducting case study analysis is to have an overall analytic strategy. Yin (2003) proposed three general strategies that allow defining priorities for what to analyse and why. These strategies are:

- “*Relying on theoretical proposition*” that is the most preferred strategy in case study analysis. It highlights that the objectives and design of the case study are based on a theoretical proposition that in turn reflects a set of research questions and research hypotheses.
- “*Thinking about rival explanations*” that focuses on defining and testing rival explanations. This strategy can be related to the previous one; however, it is relevant even in the absence of such theoretical propositions.
- “*Developing a case description*” in which the main objective of the case study is the description of the case itself. In this sense, a descriptive approach is mainly used to identify first, the embedded unit of analysis and second, an overall pattern to address the objective drawn from the case.

For the purpose of this study, the first strategy for data analysis is deemed to be more appropriate since the conceptual framework of EIS factors and EIS participation lifecycle was developed first and the research propositions and objectives drawn from the conceptual framework shaped the data collection plan. In this regard, four main steps of qualitative data

analysis that have been recognised by several researchers (e.g. Creswell and Clark, 2007; Denscombe, 2007) were followed:

Preparation of the Data: In this stage, all the collected data including fieldwork and interview notes, interviews transcripts, official reports and white papers were prepared and organised. For this purpose, a word document template was used to categorise and store all interview transcripts and then other notes were added to the file based on the relevance category.

Familiarity with the Data: Having organised and prepared the data in a suitable way, the researcher went through the data to become thoroughly familiar with the structure of the material. This stage should not be taken for granted as less important since it allows the researcher to spot the inconsistency, relations and contradictions within the data collected through several sources.

Data Analysis: Having prepared the raw data and become familiar with the structure of the data, it is then time to select a formal technique to carry out the analysis. Several techniques for analysing case studies have been identified in normative literature including pattern matching, explanation building, time-series analysis, logical models, data display and analysis, grounded theory etc. (Saunders *et al.*, 2009; Yin, 2003; Miles and Huberman, 1994). For analysing data collected in this study, two specific techniques were employed: pattern matching (Trochim, 1989) and data display and analysis (Miles and Huberman, 1994).

Pattern matching logic, one of the most desirable techniques for case study analysis, was employed (Yin, 2003). This technique attempts to link two (or more) patterns where one is a theoretical based pattern and the other is observation based (Trochim, 1989) in which if the patterns coincide, the results can strengthen the case study validity. This technique was used in this study as first the conceptual framework for EIS participation in LGAs was developed, utilising (a) DOI and TOE theories as the main foundation and critical mass theory and social exchange theory for justifying some of the proposed factors and (b) a variety of concepts of IOS, information sharing and decision-making processes in public sectors and then test the adequacy of the framework through interview, observation

and documentation data.

As it is illustrated in Figure 4-4, two independent patterns proposed through the conceptual framework; factors influencing EIS in LGAs containing 18 factors and phases of EIS participation including 5 phases. An interview questionnaire was developed based on each pattern and their sub-patterns (i.e. factors and phases) allowing one-by-one comparison (i.e., proposed pattern and observed pattern).

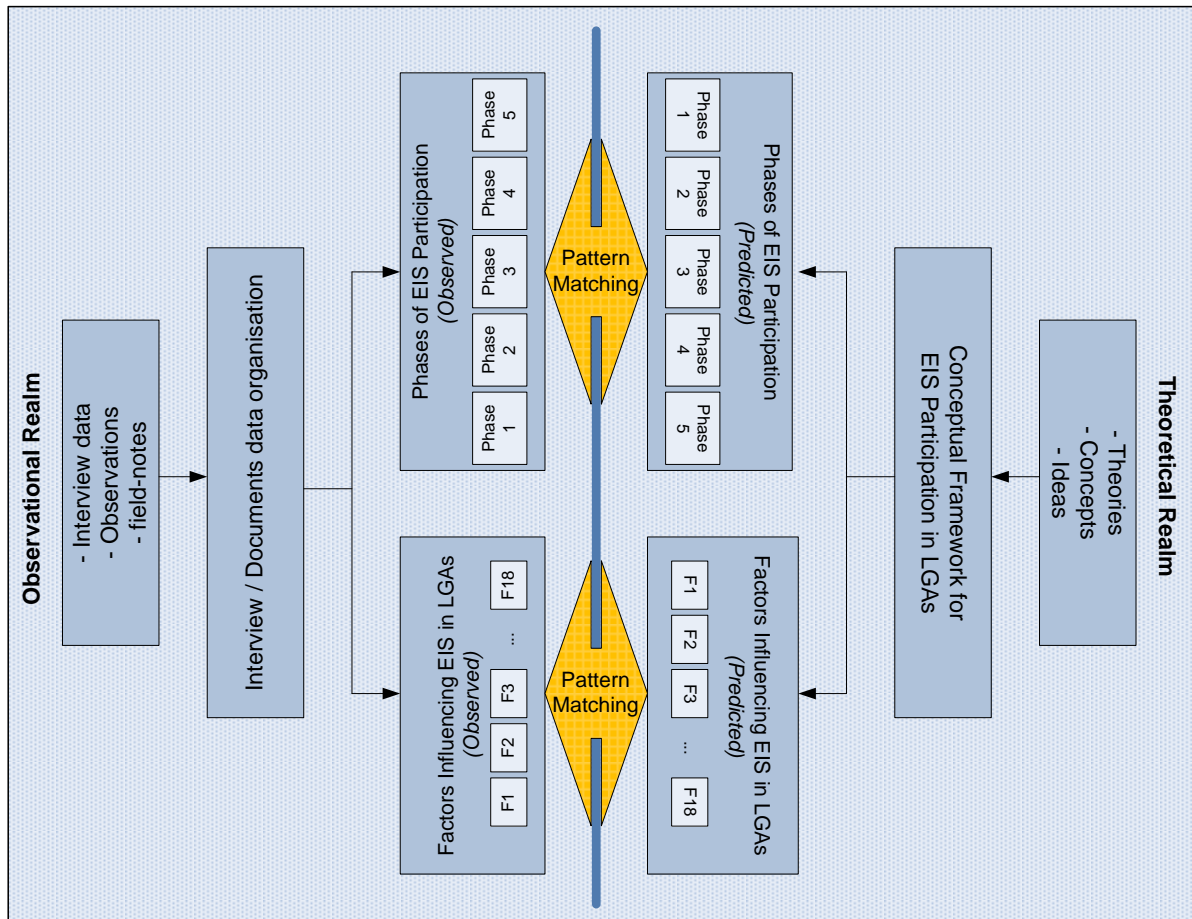


Figure 4-4: Pattern Matching Model

In addition to pattern matching technique, the data display and analysis approach was used in order to (a) simplify, abstract and transform the data known as “data reduction” and (b) visualise data through the creation of tables and figures known as “data display”. As multiple cases are used in this research, displaying data on tables and figure allows the researcher to compare the collected data from each case and come up with specific results and findings.

Data Validity / Creditability: The last stage of data analysis involved in validity and reliability of empirical findings. Although the primary goal of an interpretive research is not to develop theory that is testable in a narrow sense, its validity or creditability may still be assessed (Gregor, 2006). Walsham (1995) expressed that establishing validity in the eyes of the readers is the art of persuasion that the data are reasonably likely to be accurate and appropriate. To address the matters of appropriateness of the data collected in this research, two tasks were carried out:

- Using multiple sources to boost confidence that the data are on the right line. This allowed the researcher to compare data collected through different methodological approaches (methodological triangulation) i.e. interviews, documentations, archival records as well as different participants and interviewees (informant triangulation).
- The researcher returned to the interviewees and presented the findings as a means of checking the validity of findings. By doing this, the findings would be validated (or amended) by those whose opinions, views and experiences are being studied.

4.5 Conclusions

This Chapter presented the research approach and methodological stages used in this study. A discussion on epistemological stances and their appropriateness were initially introduced. Based on the objective of this research and the analytical insights that it seeks to offer, interpretivism was selected as the most appropriate approach. Thereafter, quantitative and qualitative research methods were explained.

The researcher called *Understanding the participants' perspective, understanding the social and organisational context, understanding the causal processes and enhancing the utilisation of the results* as the main reasons for selecting a qualitative approach in this research.

Section 4.3 focused mainly on selecting the research strategy. It was argued that *the nature of the research question(s) and objective(s), examining the phenomenon in its natural setting, previously under-studied area, comparing with other related strategies* are among the main reasons why exploratory case study strategy was selected as the most suitable strategy for the research presented in this thesis. These arguments were followed by a brief summary of each

selected case study.

In the subsequent section, the researcher started to focus on the empirical research methodology carried out in this thesis. It was divided into three main stages namely; (1) research design, (2) data collection methods and (3) data analysis approach. In the first stage, all the steps from beginning to end were explained. In the second stage, interviews and documents were explained and discussed as the primary sources of data and in the final stage, pattern matching and data display were justified as the main data analysis approach. In the last section, section 4.5, it was discussed how data validity and creditability were achieved through the use of multiple data sources and follow-up interviews.

Chapter 5 – Case Studies and Research Findings

5.1 Establishment of LGAs in England and Wales

Local Governmental Authorities in the United Kingdom are organised into a mixture of single-tier and two-tier systems (Local Government Association, 2010). In Wales and most parts of England, a single-tier “all-purpose council” is responsible for all local authority functions. This type includes London Boroughs, Metropolitan Authorities and Unitary Authorities. Outside the major urban areas in England, a two-tier system whereby two separate councils divide responsibilities between District and County Councils is in place. County councils cover a population in a range of 500,000 to 1,500,000 while District Councils cover a population about 100,000.

Depending on their type these authorities are responsible for providing a diverse range of services (summarised in Table 5-1) aimed at meeting citizens’ needs as well as the management of a complex service infrastructure that supports communities and businesses (Johnson and King, 2005). Within a common legislative umbrella set by Parliament and funding by Central Government, each LGA is significantly independent in the development of its own organisational, bureaucratic and ICT solutions. The structures of LGAs have been traditionally based on a bureaucratic framework that highlights the notion of decentralisation and specialisation in a pre-planned approach (Senyucel, 2005). Administration and service delivery processes, therefore, have tended to be organised with the same bureaucratic approach. This potentially results in inefficiency and inflexibility in business processes in which LGA staff and their roles are locked into vertical hierarchies (Bentley, 2001).

Local authorities in the UK have been in a state of constant change over the past two decades. However, since 1997 they have found themselves at the sharp end of an ambitious programme of reform called “Local Government Modernisation Agenda” (Cowell and Martin, 2003). It was set by the Labour Government as one of the foremost reform agendas to develop local authorities that are more dynamic, entrepreneurial, efficient, effective and in touch with their users and citizens (Newman *et al.*, 2001). In 2003–2004 nearly one quarter of all UK e-government spending was by LGAs in order to move towards the reforms (KableNet, 2005). This spending was largely sponsored by the Office of the Deputy Prime Minister (ODPM), which believed that these reforms make LGAs more accessible,

convenient, responsive and cost effective (ODPM, 2002).

Responsibility	Unitary	London	Metropolitan	County	District
Education Services	•	•	•	•	
Housing Services	•	•	•	•	•
Planning Application	•	•	•		•
Strategic Application	•	•	•	•	
Transport Application	•	•	•	•	
Passenger Transport	•			•	
Highways Services	•	•	•	•	
Fire and Rescue Services	•	•	•	•	
Social Services	•	•	•	•	
Libraries	•	•	•	•	
Leisure Services	•	•	•		•
Waste Collection	•	•	•		•
Waste Disposal	•	•	•	•	
Environmental Health	•	•	•		•
Collection of Revenue	•	•	•		•
Electoral Administration	•	•	•		•

Table 5-1: Responsibilities of Councils by Types

To date, in spite of the promising intention of the reform agenda, many local policymakers and practitioners claim that LGAs are far from achieving the objectives of the reform. This may be a result of (a) poor alignment between the reform agendas and the capability of LGAs to implement them and (b) the severe impact of the Comprehensive Spending Review (CSR) announced in October 2010 in which the authorities' spending will be cut by 7% (HMTREASURY, 2010). As one of the actions to tackle these two issues, the Coalition Government announced the "Local Government Structural Reform Plan" in July 2010 (DCLGStructuralReformPlan, 2010). This new plan marks a radical shift of power from Westminster's Whitehall to LGAs in order to first, decentralise the processes of decision-making which put councils in control of their communities and second, reengineer the service delivery processes to a self-service approach, which reduces the operational costs instantly.

This reform agenda also pushes LGAs towards a cross-departmental approach that recognises the key role of departments in service delivery. The approach can be contrasted with a more corporate approach where the LGAs' management is in charge of the decision making and the

design of service delivery(Cole and Fenwick, 2003). This style of working enables LGA departments to make their own decision that is firstly harmonised with the whole authority's objectives and secondly is based on the interest and well-being of the citizen. However, this approach has not been fully functional in UK local authorities since the Local Government Act 2000 (HMGovernment, 2000) restricts LGAs from making all their own decisions. Based on this act, if a council acts outside its powers, such as spending money on some operations that are not authorised, it has acted "beyond the powers" and the councillors who were guilty of this would be held liable(Cole and Fenwick, 2003). Therefore, in order to overcome this issue several LGAs create an executive board with representatives from each department to approve any office proposal based on the departments' capability and resources (ibid).

Although these reforms in decision-making processes hold a great potential to improve LGA performance, Holden and Norris (2003) argue that there are no systematic research results that justify a rapid transition. The major benefits of these changes will only be realised when the process of decision-making can move the legacy of bureaucratic delivery mechanisms to faster, simpler and more flexible technology-facilitated delivery processes. This transformation in decision-making requires a deeper understanding of the inter- and intra-organisational, human and technical challenges involved.

5.2 Case Study I: LGA_NW

5.2.1 Background to LGA_NW

For reasons of confidentiality, the term LGA_NW will be used to refer to the first case study. LGA_NW is a UK unitary LGA covering a total of 113,000 hectares in the North West of the country providing all major services such as education, social services, leisure, planning and highways. The council serves a population of approximately 120,000 – 130,000 citizens and public service customers and a staffing establishment of 6,500. The annual revenue budget of the council is about £200m and the annual IT revenue budget is £3.5m. LGA_NW receives around 1000 citizen enquiries via telephone and email, while face-to-face contacts are approximately between 150 and 200 on a daily basis. In March 2012 the council published a draft of its corporate plan that sets out the key priorities for the next five years. The main focus of this plan is to make the frontline services such as education and social services more resilient since the council should save millions of pounds each year due to the budget restraints. In order to do so, introducing the culture of “inter-departmental collaboration” to the organisation and “working in partnership” has been set as the main target.

Prior to presenting the findings, for a better understanding of the case study, the next section discusses the LGA_NW IT infrastructure and the motivation for Electronic Information Sharing. Subsequently, the *Home-to-School* project will be analysed in order to assess the proposed factors, the mapping of the factors to the decision-making phases, prioritising the importance of the factors in relation to the phases and summarising the findings. A similar introduction will be applied for each case study.

5.2.2 Background to the LGA_NW IT Infrastructure

The UK Central Government has heavily put pressure on local authorities in an attempt to re-engineer internal business processes and to re-shape the relationship between the departments (Beynon-Davies, 2005). In order to respond to this demand, the business management team in LGA_NW believe that their IT infrastructure is required to be re-structured for improved flexibility. At present, the authority runs more than 200 IT systems that are developed and implemented across 14 departments. These systems support most of the service delivery operations and function on a range of 25 heterogeneous platforms, operating systems and data structures. As a result of the lack of common IT infrastructure, almost all of the LGA_NW's departments adopted their own business applications to support their activities. In 2011, the

Local Authorities ICT Strategies was published to enhance the quality of service delivery in the local level in England and Wales. Most of the policies were focused on inter-departmental collaboration and shared services. However, since then, unlike other larger authorities, LGA_NW has received very little funding from the Central Government to develop and implement new integrated business applications as the basis of inter-departmental partnership. This has been regarded as the major barrier that holds back LGA_NW to reach their business goals. Therefore, the authority has not been able to establish an efficient business processes co-ordination among its departments due to the non-integrated nature of the applications.

The preliminary meetings with the Head of IT (HIT) and the Information Systems Manager (ISM), prior to the formal interviews, emphasise the fact that the IT infrastructure in LGA_NW is unquestionably underdeveloped and not integrated. Therefore, the authority is faced with several limitations prior to initiating the effort of EIS. As HIT stated:

“... Inter-departmental collaboration in such an environment where each of our divisions had their own business process as well as corporate information systems is quite impossible...”

The non-integrated IT infrastructure at LGA_NW before adopting any Inter-organisational Systems (IOS) as agreed by all interviewees is shown in Figure 5-1. This figure illustrates that operations and business activities in each department relies on several non-integrated information systems. Consideration about integrating existing information systems in LGA_NW was initiated by defining a specific set of criteria. These criteria were developed by one of the senior information officers and agreed by the top level management. Some of the key criteria were:

- Whether any hardware/software upgrade is required for existing corporate systems.
- Considering the ease of migration from one system to another.
- Considering the lease or licensing agreements of hardware / software are coming to an end.
- User/officials satisfaction with existing legacy systems.
- Consideration of training requires for both internal and external users after the integration took place.
- User and service disruption while the integration projects is taking place.

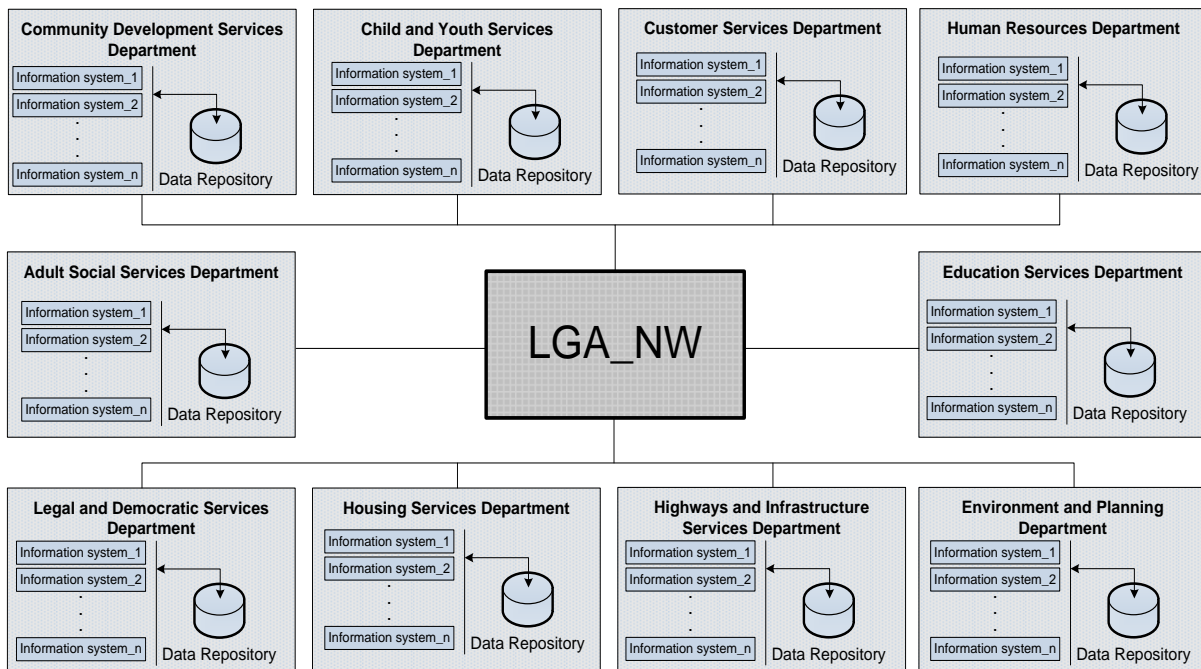


Figure 5-1: IT Infrastructure at LGA_NW

The Systems Division under the direction of the IT Systems Manager was appointed the main responsible for proposing solutions to meet the above aspects. However, it was clear that significant human and cost resources required developing such integration across the authority.

5.2.3 Motivation for Electronic Information Sharing in LGA_NW

In 2009, the officials in LGA_NW started to realise that having a large IT infrastructure where each department employed several legacy systems with overlapping functionality is not cost effective. They also reached the point that too many heterogeneous corporate systems within the authority have decreased the level of LGA's performance.

During the discussion on this issue, the Head of IT (HIT) pointed out that:

"... The process of delivering some specific services is very costly and slow as a result of the incompatible legacy systems across the authority. This, to some extent, has restricted our development and performance improvement plans ..."

Moreover, one of the main business goals defined by the senior management in LGA_NW was to work towards delivering citizen-centric rather than organisational-centric services.

The researcher observed that the technological capability of LGA_NW does not fully support the business processes in the departments and therefore it will be an obstacle in achieving their objectives. The Information Systems Manager in the Customer Services Department (ISM) added to this by stating:

“... Citizen- and business-centric service delivery requires efficient inter-departmental collaboration, logical business processes and secured information sharing to be supported by interoperable and integrated corporate systems ...”

The analysis of relevant reports related to LGA_NW (e.g., Corporate Assessment in 2006 and 2007) indicates that local authorities across the country, including LGA_NW, are under enormous pressure by the Central Government for providing integrated service delivery. In this regard, one of the major improvement plans was specifically focused on reforms needed to support more effective and integrated children services. Several departments within LGA_NW involved in children support services (e.g., Education Services Department and Social Services Department) are concerned about handling information since they own and manage their applications and databases.

At early stages during the development phases, the official in LGA_NW recognised that an integrated approach to the delivery of services for children in need and their families would require an intensive collaboration among several departments. Therefore the authority initiated a plan for developing a collaborative pilot project. The key motivation behind this project was to address the existing limitations of its children service delivery and ensure that assessment, planning and decision-making lead to good outcomes for children in need. The initial decision for the pilot project was made by the LGA_NW Councillors after several meetings with the Heads of those departments involved in children service delivery.

The top management in LGA_NW did not take the decision to fully integrate all legacy systems across the authority, as such a solution was costly and complicated to adopt. The Head of IT reported that the plan for integrating the legacy systems across the organisation on a large scale was considered as a high risk project for the following reasons: (a) there was no single solution to support the integration of all corporate systems and cover a wide range of business activities, (b) there was a lack of knowledge among the LGA_NW staff for employing integrated applications and (c) lack of inter-departmental collaboration and sharing

culture among the employees.

Therefore the pilot project went ahead and the overall exploration of the interviews indicates that the members who were involved in the pilot project had a positive attitude and that they were supportive towards the development and implementation of it. For instance, the HIT indicated that

“... The initiative of information sharing is seen as the key to successful collaborative operations across the authority’s children’s services to improve the outcomes for those who are in need, those who need the most attention ...”

In the next section, the description of the pilot project that incorporated three key departments of LGA_NW will be discussed.

5.2.4 Description of the Case: Home-To-School Integrated Project

One of the major services for the young and children within the borough is to provide education support to children with special needs. Based on the Children Act 1989, LGA_NW defined children in need as children who are aged under 18 and: (a) need local authority services to achieve or maintain a reasonable standard of health, or (b) need local authority services to prevent significant or further harm to health or development, or (c) suffer from any kind of disability.

Prior to the initiation of the pilot project, as it can be observed from Figure 5-2, the authority was following a hub approach in which the various systems holding children’s data were 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, needed 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 and address) caused 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.

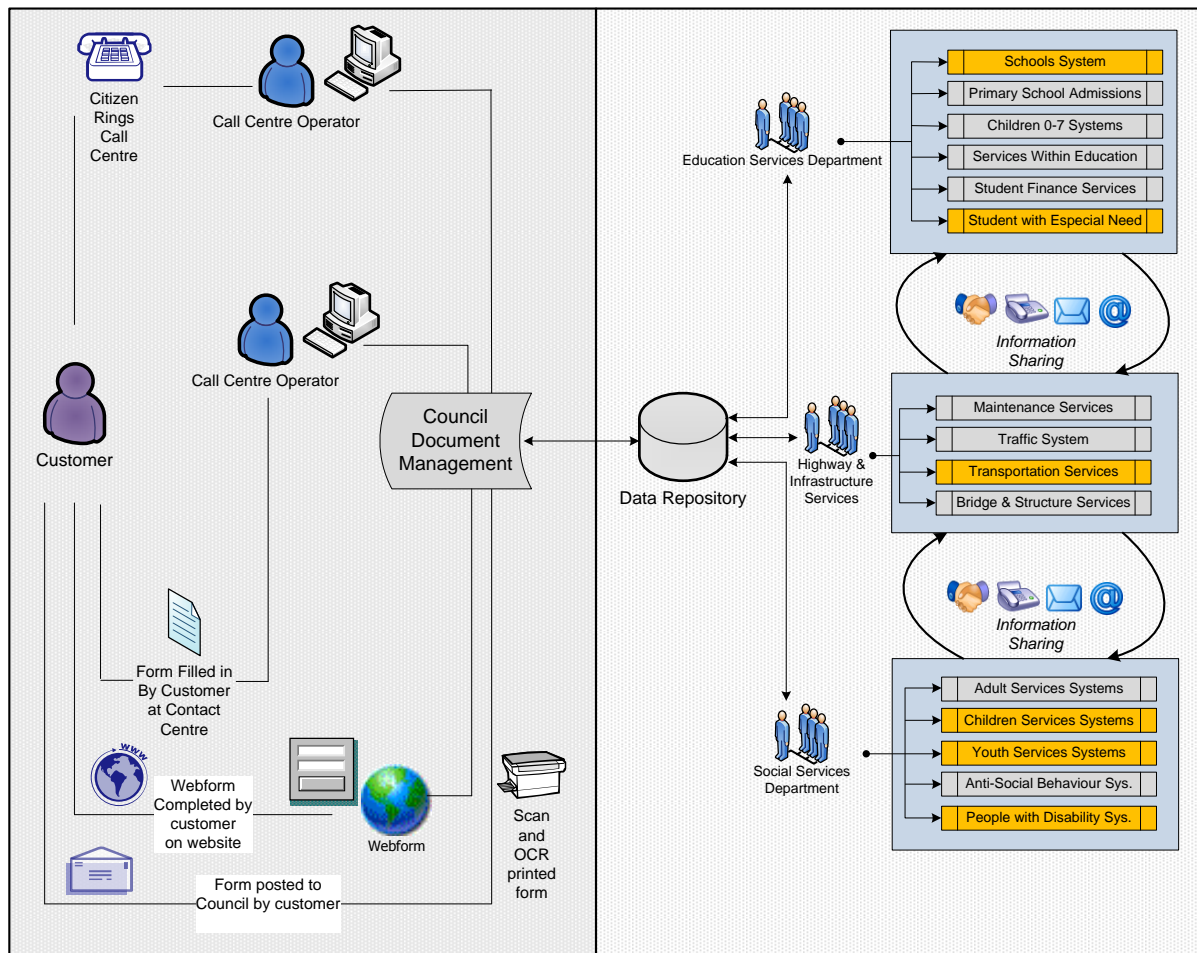


Figure 5-2:Hub Approach to the Children Service Delivery at LGA_NW

These issues occurred as the result of the absence of a Customer Relationship Management (CRM) system in the first place, as well as, an efficient integrated system with multiple access from the involved departments. Some of the key drawbacks of this architecture are summarised as below:

- Due to lack of a CRM system, LGA_NW was not capable of differentiating the citizens' requests. This means all the requests collected from different channels (e.g. through web-forms and call centre) were storing on the Council Documents Management System and had to dispatch to the relevant department manually.
- There was no real time information flow among the departments involved in joint services (e.g. children education services). Most of these flows were through handling paper based

forms, telephone conversations and email. As these communications were not fully recorded, responsibility of any inaccurate task was problematic.

- The performance of joint service delivery was so slow. The reason was that if the requested service required information that was not available in the central data repository, the information had to manually be extracted from the departments' back office systems/applications by the staff member. This information then communicated back to citizens through the communication channel.
- The legitimacy and purpose of sharing a piece of information were never clearly checked by senior staff in the entitled department.

Therefore, as a result of these downsides, 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 overall aim of the pilot project was to enhance the effort of inter-departmental information sharing through an integrated, flexible and maintainable infrastructure. The LGA's officials defined the main objective of the project as improving the efficiency and security of children services through: (a) enhancing the collaboration among Education Services Department, Highway and Infrastructure Services Department and Social Services Department, (b) improving information sharing through IOS, (c) improving the alignment of the selected departments' business processes.

As it is shown in Figure 5-3, the system connects directly with an integrated database fed by four integrated corporate systems;

1. Children Support System controlled by the Social Services Department for processing the data of pupils,
2. School Management System controlled by the Education Services Department for processing school locations and admission data,
3. Route Optimisation System controlled by the Highway and Infrastructure Services Department for processing routes and vehicles information and
4. Geographic Information System (GIS) controlled by the Housing Services Department for processing the data of pick-up/drop off points.

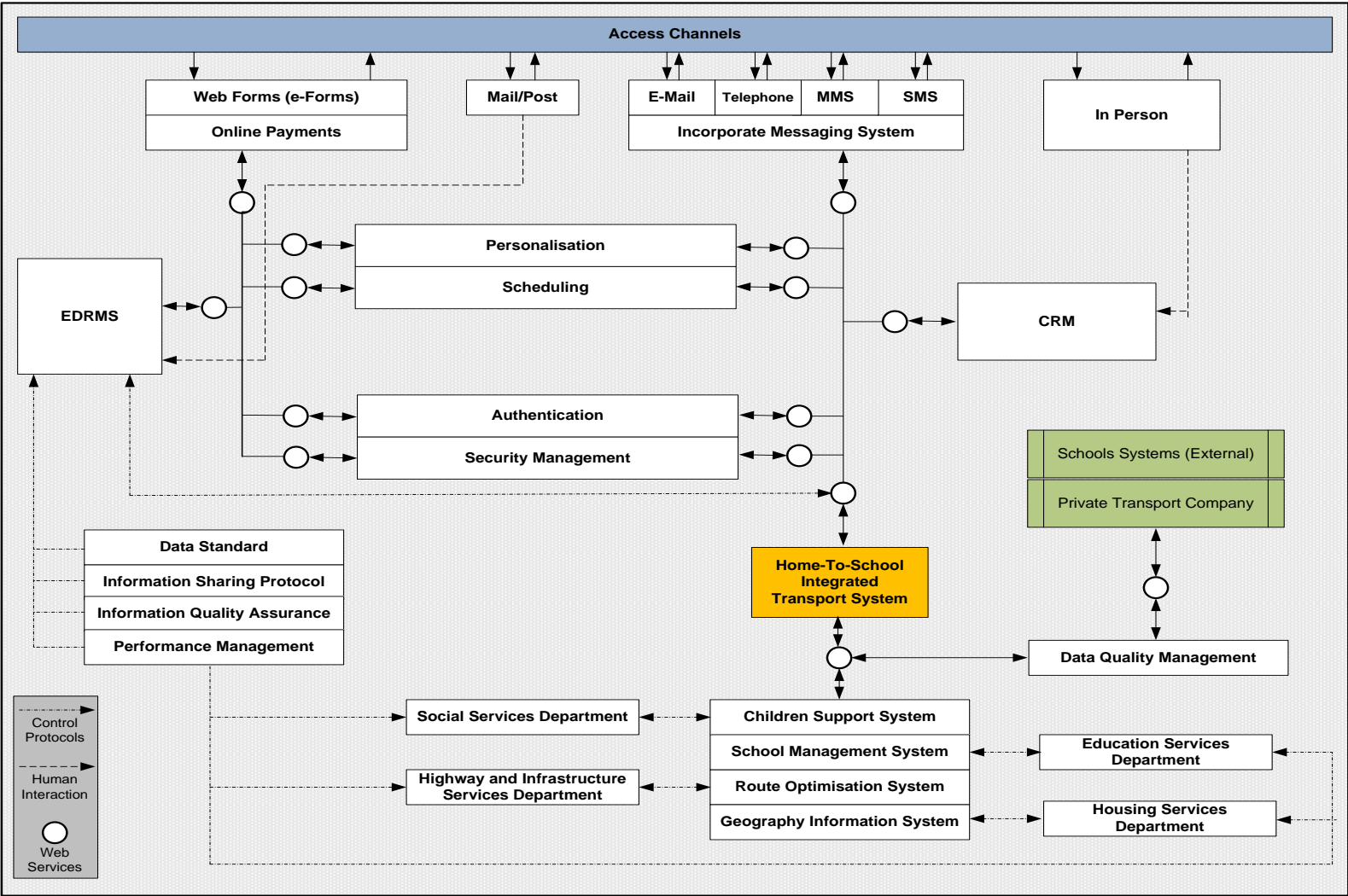


Figure 5-3: Architecture of the Home-To-School Integrated System at LGA_NW

Compared to the previous architecture, an Incorporate Messaging System and a CRM System were employed as the main link between the front office and the back office applications. 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 and loading data through integration with a Geographic Information System (GIS), matches designated vehicle and driver and directs them to the designated pick-up/drop off points through integration with the Route Optimisation System and records all the operational actions on a regular basis.

The Children Support System provides a comprehensive and flexible case management tool for practitioners in LGA_NW enabling them to view a detailed picture of every child. Practitioners with authorised access can view a child's contact details and more detailed information, such as the type of their disability, attendance and the involvements of other services. Details of any support provided to the child, can be recorded, viewed and shared with other authorised staff in the involved departments. Moreover, details of telephone calls, letters, faxes and emails can be recorded and practitioners can record and store details of their work through an internet-enabled PC or laptop. An adaptable case timeline tracks individual involvements and guides practitioners through the next steps to take with each child.

Pupil address information is linked with the School Management System as well as the GIS to enable LGA_NW to automatically determine which children live in the school's catchment area. Home-to-school distances can be instantly calculated when required via appropriate roads and footpaths so that the council can allocate school places using a consistent approach. Individual vehicles details such as registration number, number of passengers and wheelchair capacity can be recorded and processed in the Route Optimisation System. When the vehicle is attached to a route dependent on passenger needs, the capacity is adjusted accordingly to enable actual spaces to be accurately managed. Drivers and escorts can also be attached to vehicles. Therefore, children's addresses, school choices, home-to-school distance and the vehicles/drivers data are maintained within one integrated source, so that school place allocations can be made automatically. The GIS can display the results on a map so there is a visual representation of where children live in relation to a school. When data is presented in this format, it is far easier to read and analysed compared to when shown in a table or graph, as would have been the case previously.

The system 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. While all transactions such as processing and sharing information are governed and controlled by the information sharing protocol and information quality assurance, they are recorded in an Electronic Document and Records Management System (EDRMS). This system enables LGA_NW to manage documents and records throughout the document life-cycle, from creation to destruction. Moreover, the LGA's official can trace which department, practitioner, or employee has been working a specific child's case and when.

The findings of the Home-to-School project will be discussed in two parts. In the first part, the findings will be categorised based on the information sharing context discussed in Section 2.6 and in the second part, the research propositions identified in Section 3.5 will be tested.

5.2.5 LGA_NW Case Study Findings 1: Information Sharing Contexts

The first part of the findings will be based on the main four contexts of information sharing presented in Chapter 2 (Section 2.6): Technology Solution, Organisational/Business Process, Inter-organisational Settings and Policy and Social Environment.

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 and adoption. The HIT 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 ..."

The findings of the Home-To-School Integrated Project are summarised below:

- **Technology Solution:** Selecting an integrated solution that could support the home-to-school effort was a complex process as the infrastructure and knowledge of the

participating departments in LGA_NW were varied. Moreover, since there was a plethora of IT vendors that specialised in supporting inter-departmental business activities, there was confusion over the selection of the appropriate IT partner. The findings of the pilot project indicate that the IT department as the main responsible for implementing the system did not use any evaluation framework or any other tools to assess the IOS. Regarding this issue the Information Systems Manager (ISM) commented that:

“... The officials in the authority would prefer to be told which software package to use as information sharing through inter-departmental information systems is a relatively new concept and local authorities are relatively risk averse ... the current slow uptake of the new system has been based on a wait-to-see attitude where the authority is waiting to see what others have done/planned to do ...”

As a result of a blurred procedure and lack of formal processes for selecting an appropriate IOS, the senior management in the IT department took the final decision by just relying on the selected vendor's expertise. Implementing and adopting such systems should be considered as a high risk effort as it is concerned with the replacement of the existing applications with an integrated suite of application from one vendor. Despite the critical nature of this process, LGA_NW underestimated the time and effort it takes to make a well informed decision. This mode of decision-making raises some important questions including: Does the selected system address all the requirements defined for children in need service delivery? Or does the selected system provide information security and privacy?

The findings of the pilot project also illustrates that although the applications involved in children services were integrated, the effort of information sharing is still faced with some informational constraints. The discussions with the interviewees highlighted that data structure and data ownership were two major problems for EIS in LGA_NW. For instance, the HIT pointed out that:

“... What makes information sharing risky is that the development and adoption of integrated corporate systems in the authority poses particular challenges around information ownership; who can access it, who should deal with updates, errors, record repair, liability and remedy if anything goes wrong ...”

- **Organisation / Business Process:** In the context of this research, this category focuses on business processes in each department involved in the project. The departments realised that ‘process mapping’ covers several issues such as ‘what work is done by whom’ or ‘what information gets recorded by whom and when’ enable them to rationalise their current processes. However, the researcher’s observation of the pilot project proves that mapping local business processes of each department was tremendously time-consuming and took much longer than anticipated. The Information Systems Manager reported that the delays arose for two main reasons:

“ ... The senior officers of the participating departments mistakenly assumed that major revisions would not be required to bring existing business processes in-line with the integrated system ... moreover, the department underestimated the time taken to prepare a development proposal for an effective integrated system ... ”

These two issues had significant impacts on the implementation plan and budget allocation. Another issue regarding the alignment of the system and the workflow of the departments was ‘flexibility’. All the interviewees agreed, to a certain extent, that any intergraded IT system that incorporates workflow functions must be flexible enough to respond to the complexity encountered by officials in their day to day activities. The Principal Team Leader (PTL) in the Social Services Department argued that:

“ ... It seems that the employees within our department dislike the system as it is too inflexible. The fact is that the requests we are dealing with are daily and not pre-defined. The system is incapable of running several queries simultaneously. This situation where the users cannot do what they need to do can be frustrating and counter-productive ... ”

The observation of the workflow shows that, as a result of the above issue, the employees within the social services department tend to revert to their own parallel methods, e.g. using manual documents to capture information and being disconnected with the main system. This parallel workflow, especially when employees deal with sensitive information, is extremely risky possibly leading to poor data quality and putting children’s’ privacy in jeopardy.

- **Inter-organisational Settings:** In the context of this research, this category focuses on

inter-departmental relationships and the collaboration processes among them. The findings of the pilot project illustrate that the home-to-school system significantly changed the work processes, including decision processes, in inter-departmental collaboration. Each department appointed an Information Sharing Officer (ISO) as the main coordinator of sharing information. All queries, when undertaking a social operation, from the CRM system or EDRMS are submitted to the ISO of the Social Services Department where he ensures that practitioners or officials from other departments are provided with the appropriate information. Regarding this matter, the Project Management (PM) in the Education Services Department stated that:

“... The new way of information flow among the department assists the practitioners in identifying any further actions/information that maybe required to complete the operation ... it also supports the front-line managers by checking when, how and whether key actions and information have been undertaken and recorded ...”

On the other hand, inflexible departmental structure in LGA_NW has influenced the effort of information sharing, even through an integrated system like home-to-school system. The researcher’s observations prove that the departments have been organised by function-oriented teams and this created a vertical structure divided by hierarchies. The relationships between different hierarchical levels are regulated by inflexible rules and policies that are barriers to the fluidity of information. In such an environment where even relationships among different teams in one department are limited, the inter-departmental collaborations become much more restricted.

The interviewees mutually believed that since the initiation of the home-to-school pilot project the level of inter-departmental trust has been vividly enhanced. The Head of IT Department reported that the senior management team consisting of the Head of participating departments, the Information Sharing Officers and the systems development team have two meetings per month; first to control and monitor the status of the project to ensure it is moving along as planned and second to discuss its technological and organisational impacts on each department. He stated that:

“ ... I personally believed that these regular meetings have raised the level of

trust in the authority because the senior managers are now more involved and aware of the stages of the project and its implications ... we are working towards building trust but this may take up to years ... ”

Although the improved communications through the regular meetings have some positive effects on inter-departmental trust in LGA_NW, based on the researcher's observation, the pace of trust building in the authority is fairly slow. Consequently, most of the activities of children services (e.g. who should be picked up from where, which practitioner is in charge of a specific group of disable children and so on) are addressed on a daily basis. Moreover, more sensitive information are still gathered, processes and shared through a paper-based system.

- **Policy and Social Environment:** As described in Chapter 2, this category focuses on the external pressures that influence the initiative of EIS. The findings of the pilot project illustrate that legal guidance as well as budget cuts imposed by the Central Government had severe impacts on EIS in children's services. The lack of clarity on the legality of information sharing impacted the business activities of LGA_NW especially in relation to sensitive and confidential information. The discussions with the interviewees indicate that the conflicting guidance on information sharing from several government bodies, such as the Ministry of Justice or the Department for Education, has hindered the process of the home-to-school system. Two arguments were raised during the interviews. The first point was focused on the law and regulation itself and the second one was related to the awareness and understanding of the existing regulations and attitudes towards them. While discussing this issue, the HIT clarified that:

“... Information sharing has been a complicated process as there is no single source of policy that controls the collection, store, share and dispose of the personal information. So, any information sharing effort even through integrated corporate systems is regulated by sets of implied legal rules ...”

Furthermore, the Information Systems Manager (ISM) commented that:

“... The absence of clear legal advice that either sanction or prevent information sharing may result in one of two outcomes; either the staff make decisions based

on their experience and what they feel is right or, in most of the cases, they differ to make decisions due to fear of making a mistake ... ”

He continued:

“... Regrettably, there is a fog of ambiguity and uncertainty surrounding the legal framework to sharing individual and businesses information in the UK ... ”

The limitations caused by laws and regulations were pointed out by almost all of the interviewees. They were concerned about the privacy protection of individuals with regard to the processing and movement of personal data. They agreed that a key question still needs to be addressed. This question is: “To what extent the current regulations should be revised in order to facilitate information sharing while protecting citizens’ privacy?”

Furthermore, there was a mixed viewpoint among the interviewees regarding financial issues. For instance, the PM argued that:

“... The authority is facing the most severe cutbacks in its spending as we rely on the government funds. We should focus on opportunities where ICT can add value proposition to the organisation in the short term ... ”

On the other hand the HIT argued that:

“ ... We are increasing our investment in information technology as well as recruiting about 40 new IT partners. The IT department believes that adoption of inter-organisation systems will automatically reduce the authority’s spending costs. However, with such IT infrastructure, the effort [adoption of IOS] won’t reach a practical point ... ”

These arguments prove that there is uncertainty among the LGA_NW’s senior management regarding the improvement of the IT infrastructure.

5.2.6 LGA_NW Case Study Findings 2: Testing Research Propositions

The above findings of the home-to-school pilot project based on the information sharing contexts further support the aim of this research by exemplifying that several barriers and enablers influence the decision of LGA departments for sharing personal information. In this section, in order to validate the conceptual framework proposed in

Section 3.5.1, the case findings based on the research propositions presented in Chapter 3 is presented. These research propositions are summarised in Table 4-2.

Research Propositions	Descriptions
<i>Testing Research Proposition A</i>	The proposed factors influencing EIS in LGAs
<i>Testing Research Proposition B</i>	EIS Participation Lifecycle in LGAs
<i>Testing Research Proposition C</i>	Mapping EIS Participation Factors on the Lifecycle Phases
<i>Testing Research Proposition D</i>	Prioritisation of the Factors on the participation phases

Table 5-2:The Research Propositions

Testing Research Proposition A: Factors Influencing EIS in LGAs

As the interview questions are based on the each proposed factor group, during the discussions with the interviewees, they commented on the importance of each factor that influenced the Home-to-School project. Table 4-3 summarises the comments, which follows a scale similar to the one used by Miles and Huberman(1994), i.e. scale of less important (○), medium important (⊙) and high important (●). The researcher uses “x” when the interviewees did not comment on a specific factor.

		Factors	HIT	ISM	PTL	PM
EE		Political Pressure (PP)	●	●	⊙	⊙
		Economic Pressure (EP)	●	⊙	⊙	●
		Legislation and Policy Principles (L&P)	⊙	●	●	⊙
		Community Pressure (CP)	⊙	⊙	●	●
CO		Inter-Organisational Leadership (IOL)	●	○	⊙	⊙
		Return on Investment (ROI)	⊙	●	●	●
		Network Collaboration Culture (CC)	●	●	●	●
		Organisation Size (OS)	○	○	x	⊙
TE		IT Capability (ITC)	●	●	⊙	⊙
		Data Security and Privacy (DS&P)	●	●	●	●
		Information Quality (IQ)	⊙	⊙	⊙	⊙
		Interoperability Framework (IF)	●	●	⊙	⊙
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)	○	○	⊙	x

Table 5-3:Validation of the Factors Influencing EIS in LGA_NW

The main argument in the External Environment category was around the Economic Pressure

as the PM clarified:

“... In this situation when our budget has enormously been cut, implementing of such projects becomes far from easy, but missing the risks and opportunities from not sharing information may 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 the 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 re-design effort to be able to utilise the integrated system efficiently ... ”.

On the other hand, the influences of other departments within LGA_NW, or other

LGA across the country that have started the EIS initiative (i.e. Critical Mass) received the least attention of the interviewees. Moreover, the interviewees did not recognise the size of the organisation as an important factor influencing their decisions on EIS.

The results of the Home-to-School project show that most of the proposed factors have a degree of “most important”. The researcher, therefore, asserts that the proposed factors (Figure 3.2) are tested through this empirical study; hence one of the objectives of this thesis is fulfilled.

Testing Research Proposition B: EIS Participation Phases

As reported in Chapter 2 and 3, adoption of any new initiative, especially technology-based effort, involves in a sequence of phases. Hence the researcher proposes five phases of EIS participation in which each department goes through prior to participate in information sharing effort; (a) Incentive, (b) Conception (c) Proposal and Agreement (d) Participation Decision, (e) Sustainability. The interviewees were asked to comment and exemplify the importance of the aforesaid phases in which they went through prior to participating in the Home-to-School project. Initially, all the interviewees agreed that these phases are quite vital to make the final decision on information sharing. For instance, the HIT clarified that

“...We are talking about sharing sensitive information, so everyone is very cautious as the risk is fairly high. Therefore a perfect breakdown of different stages is inevitable ...”.

The PTL believed that the incentive of the project triggered directly by Central Government since the “Every Child Matter” goal was defined by the Department of Education to protect children from harm and neglect. The HIT, furthermore, 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 the departments to participate. This has caused immense resistances by the departments 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 4-4.

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

Table 5-4: The Importance of the Participation Phases in the Home-to-School Project

It can be noted that, based on the findings, the participation phases are validated through the Home-to-School project. In addition to the above phases, the interviewees identified several other phases that will be discussed and analysed in the next Chapter.

Testing Research Proposition C: Mapping EIS Participation Factors on the Lifecycle

Before starting the mapping of the factors to the participation phases, the interviewees went through a short presentation on how to perform the mapping. The interviewees were asked to map the influential factors influencing EIS in relation to different phases of participation. The results based on each phase are shown in Table 4-5. The last column – Results – indicates the number of interviewees who mapped the specific factor on the selected phase.

The factors that received less or no support – i.e. none, one or two interviewees supported – are discarded. The reason is that those factors, based on the correspondents' view, had less influence or even no influence on the specific phase. For instance, in the Incentive phase, just one interviewee supported that Organisation size is influential. On the other hand, those factors supported by three or more interviewee are utilised for further analysis, i.e. prioritisation section. As an example, Table 4-6 summarises the factors with high support in the Incentive phase that will be further analysed in the prioritisation process. The results highlight varied findings from the mapping of factors to each participation phase. This may be a result of the different understanding and observation of each interviewee during the pilot project.

		<i>Incentive</i>					<i>Conception</i>					<i>Proposal</i>					<i>Participation Decision</i>					<i>Sustainability</i>				
Factors		HICT	ISM	PTL	PM	Results	HICT	ISM	PTL	PM	Results	HICT	ISM	PTL	PM	Results	HICT	ISM	PTL	PM	Results	HICT	ISM	PTL	PM	Results
EE	Political Pressure	✓	–	✓	✓	3/4	–	–	–	✓	1/4	–	–	–	–	0/4	✓	✓	–	✓	3/4	✓	✓	✓	–	3/4
	Economic Pressure	✓	✓	✓	–	3/4	✓	✓	✓	–	3/4	–	–	–	–	0/4	–	–	–	–	0/4	✓	–	✓	–	2/4
	Legislation and Policy	✓	–	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	✓	–	✓	3/4	✓	✓	✓	–	3/4	–	–	✓	✓	2/4
	Community Pressure	–	–	✓	✓	2/4	–	–	✓	–	1/4	–	–	–	–	0/4	✓	✓	✓	✓	4/4	✓	✓	✓	–	3/4
CO	Inter-Org. Leadership	–	–	✓	✓	2/4	✓	✓	✓	✓	4/4	✓	✓	✓	–	3/4	✓	✓	–	–	2/4	✓	✓	–	–	2/4
	Return on Investment	✓	–	✓	✓	3/4	✓	–	–	✓	2/4	✓	–	–	✓	2/4	–	✓	✓	✓	3/4	–	–	–	✓	1/4
	Network Coll. Culture	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	–	✓	✓	✓	3/4	✓	✓	✓	–	3/4	✓	✓	–	✓	3/4
	Organisation Size	–	–	–	✓	1/4	✓	–	✓	–	2/4	✓	✓	✓	–	3/4	✓	✓	✓	–	3/4	✓	✓	–	✓	3/4
TE	IT Capabilities	✓	✓	✓	–	3/4	✓	✓	–	✓	3/4	✓	✓	✓	–	3/4	✓	✓	✓	✓	4/4	–	–	✓	–	1/4
	Data Security & Privacy	–	✓	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	–	3/4	✓	✓	✓	✓	4/4	✓	–	✓	–	2/4
	Information Quality	–	–	–	–	0/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	–	3/4
	Inter. Framework	✓	–	–	–	1/4	✓	✓	✓	–	3/4	✓	✓	✓	✓	4/4	✓	✓	–	–	2/4	✓	✓	✓	✓	4/4
EIS	Cost of EIS	✓	✓	–	✓	3/4	✓	✓	✓	–	3/4	–	–	–	✓	1/4	✓	✓	✓	–	3/4	✓	–	✓	–	2/4
	Benefit of EIS	✓	✓	–	✓	3/4	–	–	–	✓	1/4	–	–	✓	✓	2/4	✓	–	✓	✓	3/4	✓	✓	✓	–	3/4
	Risk of EIS	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	–	✓	3/4	✓	–	✓	✓	3/4	✓	✓	✓	✓	4/4
IDE	Business Process Com.	–	–	–	–	0/4	–	–	✓	✓	2/4	–	✓	✓	✓	3/4	✓	✓	✓	–	3/4	✓	–	✓	✓	3/4
	Inter-departmental Trust	✓	✓	✓	–	3/4	✓	✓	✓	✓	4/4	✓	✓	–	✓	3/4	✓	✓	✓	–	3/4	✓	✓	✓	✓	4/4
	Critical Mass	–	✓	✓	✓	3/4	–	–	–	–	0/4	–	–	–	✓	1/4	–	–	✓	✓	2/4	–	–	–	–	0/4

Table 5-5: Mapping of the EIS Factors to the Participation Phases for the Home-to-School Project

		Factors	Incentive Phase			
			HICT	ISM	PTL	PM
EE	Political Pressure	✓	–	✓	✓	
	Economic Pressure	✓	✓	✓	–	
	Legislation and Policy	✓	–	✓	✓	
CO	Return on Investment	✓	–	✓	✓	
	Network Coll. Culture	✓	✓	✓	✓	
TE	IT Capabilities	✓	✓	✓	–	
	Data Security & Privacy	–	✓	✓	✓	
EIS	Cost of EIS	✓	✓	–	✓	
	Benefit of EIS	✓	✓	–	✓	
	Risk of EIS	✓	✓	✓	✓	
IDE	Inter-departmental Trust	✓	✓	✓	–	
	Critical Mass	–	✓	–	✓	

Table 5-6: Factors with Moderate or Full Support on the Incentive Phase

Testing Research Proposition D: Prioritisation of EIS Participation Factors on the Participation Phases

None of the previous sections are able to illustrate the importance of each factor in relation to each EIS participation phase. This section employs the AHP technique (explained in Chapter 4) to prioritise or rank the importance of the 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. As discussed in Section 4.4, this technique encompasses four basic steps:

- I. *Decomposition*, i.e. constructing the hierarchy model consisting of the factors that received moderate or full support in the previous section.
- II. *Comparative Judgments*, i.e. pairwise comparison in which the interviewees were given instructions on how to conduct it. The matrices related to each interviewee's pairwise comparison are presented in Appendix B.
- III. *Determining Normalised Priority Weights*, i.e. to calculate the normalised priority of the factors on each phase of EIS participation, the researcher used Expert Choice, mathematical software for computing weights. Tables representing the normalised ranking of the factors based on each participation phase by the interviewees are

summarised in Appendix B.

IV. *Analysing and Calculating the Priority Weights*, i.e. based on the normalised weights calculated in the previous section, the relative priority of the EIS factors in a specific factor group are calculated and summarised in Tables 5.7 – 5.11. These Tables show the ranking of each factor in their factor group in relation to the five participation phases. The results are based on the judgement and understanding of the interviewees at LGA_NW.

Incentive Phase					
Factors		HIT	ISM	PTL	PM
EE	Political Pressure	(1)0.5850	(1)0.5561	(3)0.2161	(2)0.3624
	Economic Pressure	(3)0.2709	(2)0.2390	(1)0.3734	(1)0.3957
	Legislation and Policy	(2)0.3831	(3)0.1251	(2)0.3454	(3)0.1097
CO	Return on Investment	(2)0.1074	(2)0.1382	(2)0.1619	(2)0.2677
	Network Coll. Culture	(1)0.6452	(1)0.5530	(1)0.6480	(1)0.5354
TE	IT Capabilities	(1)0.4646	(2)0.2182	(1)0.4621	(1)0.5073
	Data Security & Privacy	(2)0.1161	(1)0.4364	(2)0.2310	(2)0.1690
EIS	Cost of EIS	(2)0.1666	(2)0.1796	(3)0.2351	(2)0.2243
	Benefit of EIS	(2)0.1666	(3)0.1029	(2)0.4402	(3)0.1560
	Risk of EIS	(1)0.6666	(1)0.6231	(1)0.9735	(1)0.6195
IDE	Inter-departmental Trust	(2)0.5500	(1)0.5657	(1)0.4062	(1)0.5657
	Critical Mass	(1)0.9166	(2)0.1414	(2)0.0812	(2)0.1414

Table 5-7: Priority Weights of the Factor on the Incentive Phase

Conception Phase					
Factors		HIT	ISM	PTL	PM
EE	Economic Pressure	(2) 0.2499	(1) 0.8333	(2) 0.1666	(2) 0.2000
	Legislation and Policy	(1) 0.7500	(2) 0.1666	(1) 0.8333	(1) 0.8000
CO	Inter-Org. Leadership	(1) 0.7500	(2) 0.3333	(1) 0.7500	(1) 0.7500
	Network Coll. Culture	(2) 0.2499	(1) 0.6666	(2) 0.2500	(2) 0.2500
TE	IT Capabilities	(3) 0.2777	(1) 0.5562	(3) 0.1939	(1) 0.4259
	Data Security & Privacy	(2) 0.2891	(2) 0.2251	(1) 0.5694	(2) 0.2845
	Information Quality	(1) 0.3713	(3) 0.1999	(2) 0.2448	(3) 0.1952
	Interoperability Framework	(4) 0.2345	(4) 0.0773	(4) 0.0686	(4) 0.0755
EIS	Cost of EIS	(2) 0.2000	(2) 0.2000	(2) 0.2000	(2) 0.2500
	Risk of EIS	(1) 0.8000	(1) 0.8000	(1) 0.8000	(1) 0.7500
IDE	Inter-departmental Trust	0.0000	0.0000	0.0000	0.0000

Table 5-8: Priority Weights of the Factor on the Conception Phase

		Proposal Phase				
		Factors	HIT	ISM	PTL	PM
E	EE	Legislation and Policy	1.0000	1.0000	1.0000	1.0000
		Inter-Org. Leadership	(1)0.6193	(1)0.6232	(1)0.5603	(1)0.6232
CO	CO	Network Coll. Culture	(2)0.2842	(2)0.2395	(2)0.3118	(2)0.2395
		Organisation Size	(3)0.0964	(3)0.1373	(3)0.1279	(3)0.1373
TE	TE	IT Capabilities	(1)0.4835	(1)0.4748	(2)0.4499	(1)0.4742
		Data Security & Privacy	(2)0.2972	(2)0.2856	(3)0.3358	(2)0.3090
		Information Quality	(3)0.1438	(3)0.1582	(1)0.5944	(3)0.1526
EIS	EIS	Interoperability Framework	(4)0.0753	(4)0.0813	(4)0.0805	(4)0.0640
		Benefit of EIS	(2)0.2499	(2)0.2499	(2)0.3333	(2)0.2000
IDE	IDE	Risk of EIS	(1)0.7500	(1)0.7500	(1)0.6666	(1)0.8000
		Business Process Com.	(1)0.8000	(1)0.7500	(1)0.8000	(1)0.8000
		Inter-departmental Trust	(2)0.2000	(2)0.2499	(2)0.2000	(2)0.2000

Table 5-9: Priority Weights of the Factor on the Proposal Phase

		Participation Phase				
		Factors	HIT	ISM	PTL	PM
EE	EE	Political Pressure	(2) 0.3052	(3) 0.2978	(3) 0.1006	(2) 0.2430
		Legislation and Policy	(3) 0.2430	(2) 0.3322	(1) 0.4663	(1) 0.6389
		Community Pressure	(1) 0.6388	(1) 0.3698	(2) 0.4329	(3) 0.1180
CO	CO	Return on Investment	(2) 0.4287	(3) 0.1226	(3) 0.1226	(2) 0.2400
		Network Coll. Culture	(1) 0.6196	(1) 0.5571	(1) 0.5571	(1) 0.6232
		Organisation Size	(3) 0.2243	(2) 0.3202	(2) 0.3202	(3) 0.1373
TE	TE	IT Capabilities	(2) 0.2243	(3) 0.1180	(3) 0.2401	(3) 0.1279
		Data Security & Privacy	(3) 0.1560	(2) 0.2847	(2) 0.2814	(2) 0.3118
		Information Quality	(1) 0.6196	(1) 0.5972	(1) 0.4784	(1) 0.5603
EIS	EIS	Cost of EIS	(3) 0.2113	(2) 0.2605	(2) 0.2430	(2) 0.2967
		Benefit of EIS	(2) 0.2209	(3) 0.1061	(3) 0.1180	(3) 0.1093
		Risk of EIS	(1) 0.5676	(1) 0.6148	(1) 0.6388	(1) 0.5939
IDE	IDE	Business Process Com.	(1) 0.8000	(1) 0.7500	(1) 0.5000	(2) 0.1666
		Inter-departmental Trust	(2) 0.2000	(2) 0.2499	(1) 0.5000	(1) 0.8333

Table 5-10: Priority Weights of the Factor on the Participation Phase

		Sustainability Phase				
		Factors	HIT	ISM	PTL	PM
EE	EE	Political Pressure	(2) 0.2499	(2) 0.1428	(1) 0.5000	(1) 0.5000
		Community Pressure	(1) 0.7500	(1) 0.8571	(1) 0.5000	(1) 0.5000
CO	CO	Network Coll. Culture	(1) 0.8333	(1) 0.7500	(1) 0.7500	(1) 0.7500
		Organisation Size	(2) 0.1666	(2) 0.2499	(2) 0.2499	(2) 0.2499
TE	TE	Information Quality	(1) 0.6666	(1) 0.8333	(1) 0.8572	(1) 0.7500
		Interoperability Framework	(2) 0.3333	(2) 0.1666	(2) 0.1428	(2) 0.2499
EIS	EIS	Benefit of EIS	(1) 0.7500	(1) 0.5000	(2) 0.2500	(2) 0.3333
		Risk of EIS	(2) 0.2499	(1) 0.5000	(1) 0.7500	(1) 0.6666
IDE	IDE	Business Process Com.	(1) 0.5000	(1) 0.7500	(2) 0.2500	(1) 0.7500
		Inter-departmental Trust	(1) 0.5000	(2) 0.2499	(1) 0.7500	(2) 0.2500

Table 5-11: Priority Weights of the Factor on the Sustainability Phase

Subsequently, the global weights of the factors on different phases of the participation

lifecycle are respectively summarised in Tables 5.12 – 5.16. The weights are calculated by aggregating the values of each factor and dividing the results by the number of interviewees. The results demonstrated in these tables do not justify that any of the factor is unimportant, but show the interviewees' perception on the importance of factors on different phases. The researcher represents a weight of "0.0000" for the factors that solely were mapped in their own factor group. In this situation, as one factor cannot have a pairwise comparison with itself, ranking was not utilised.

<i>Incentive Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Risk of EIS	0.7206
2	Capacity of Organisation	Network Collaboration Culture	0.5954
3	Inter-departmental Env.	Inter-departmental Trust	0.5219
4	External Environment	Political Pressure	0.4299
5	Technology Environment	IT Capabilities	0.4130
6	Inter-departmental Env.	Critical Mass	0.3201
7	External Environment	Economic Pressure	0.3197
8	External Environment	Legislation and Policy Principles	0.2407
9	Technology Environment	Data Security and Privacy	0.2381
10	EIS Characteristic	Benefits of EIS	0.2164
11	EIS Characteristic	Cost of EIS	0.2014
12	Capacity of Organisation	Return on Investment	0.1688

Table 5-12: Ranking of the Factors in the Incentive Phase

<i>Conception Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Risk of EIS	0.7875
2	Capacity of Organisation	Inter-organisational Leadership	0.6458
3	External Environment	Legislation and Policy Principles	0.6374
4	Technology Environment	IT Capabilities	0.3634
5	External Environment	Economic Pressure	0.3624
6	Capacity of Organisation	Network Collaboration Culture	0.3541
7	Technology Environment	Data Security and Privacy	0.3420
8	Technology Environment	Information Quality	0.2528
9	EIS Characteristic	Cost of EIS	0.2125
10	Technology Environment	Interoperability Framework	0.1139
11	Inter-departmental Env.	Inter-departmental Trust	0.0000

Table 5-13: Ranking of the Factors in the Conception Phase

<i>Proposal Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Capacity of Organisation	Inter-organisational Leadership	0.8087
2	Inter-departmental Env.	Business Process Compatibility	0.7875
3	EIS Characteristic	Risk of EIS	0.7416
4	Technology Environment	IT Capabilities	0.4706
5	Technology Environment	Data Security and Privacy	0.3069
6	Technology Environment	Interoperability Framework	0.3011
7	Capacity of Organisation	Network Collaboration Culture	0.2687
8	Technology Environment	Information Quality	0.2622
9	EIS Characteristic	Benefits of EIS	0.2582
10	Inter-departmental Env.	Inter-departmental Trust	0.2125
11	Capacity of Organisation	Organisation Size	0.1247
12	External Environment	Political Pressure	0.0000

Table 5-14: Ranking of the Factors in the Proposal Phase

<i>Participation Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Risk of EIS	0.6038
2	Capacity of Organisation	Network Collaboration Culture	0.5892
3	Technology Environment	Information Quality	0.5638
4	Inter-departmental Env.	Business Process Compatibility	0.5542
5	Inter-departmental Env.	Inter-departmental Trust	0.4458
6	External Environment	Legislation and Policy Principles	0.4208
7	External Environment	Community Pressure	0.3898
8	Technology Environment	Data Security and Privacy	0.2584
9	EIS Characteristic	Cost of EIS	0.2529
10	Capacity of Organisation	Organisation Size	0.2505
11	External Environment	Political Pressure	0.2366
12	Capacity of Organisation	Return on Investment	0.2285
13	Technology Environment	IT Capabilities	0.1776
14	EIS Characteristic	Benefits of EIS	0.1386

Table 5-15: Ranking of the Factors in the Participation Phase

<i>Sustainability Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Technology Environment	Information Quality	0.7768
2	Capacity of Organisation	Network Collaboration Culture	0.7708
3	External Environment	Community Pressure	0.6518
4	Inter-departmental Env.	Business Process Compatibility	0.5615
5	EIS Characteristic	Risk of EIS	0.5416
6	EIS Characteristic	Benefits of EIS	0.4583
7	Inter-departmental Env.	Inter-departmental Trust	0.4375
8	External Environment	Political Pressure	0.3482
9	Capacity of Organisation	Organisation Size	0.2291
10	Technology Environment	Interoperability Framework	0.2231

Table 5-16: Ranking of the Factors in the Sustainability Phase

The prioritisation results will be analysed in Chapter 6 in depth. As reported earlier, those factors that were validated and mapped in Step III were prioritised based on their importance in each phase in Step IV. Mainly, four of the factors are either not mapped in Step III or received a very low ranking in Step IV; Community Pressure, Organisation Size, Interoperability Framework and Benefits of EIS. Other factors and the participation lifecycle phases are tested and validated through the case organisation in which they have either directly or indirectly influenced the decision-making process for EIS. Therefore, the empirical findings of the LGA_NW Home-to-School Project support the literature findings and validate the EIS conceptual framework presented in Chapter 3. This claim is subject to analysis of some new factors, e.g. Critical Event and new EIS phases, e.g. *Evaluation Framework Phases* identified by the interviewees that will be presented in the next Chapter.

5.3 Case Study II: LGA_SE

5.3.1 Background to LGA_SE

Similar to the previous case, for the confidentiality reasons, the researcher uses the term LGA_SE to refer to the second case study. LGA_SE is a County Council that governs a non-metropolitan region located in the South East of England. It is one of the “Home Counties” around London that covers an area of about 1600 square kilometres. LGA_SE, through its 26,000 employees, serves over 1.5 million residents as well as 1600 businesses and corporates. LGA_SE is the fifth largest local authority in the UK serving the residents with a wide range of statute bound community, environmental, social care and education services. The funds to support the service delivery processes come from a combination of the Central Government funding, as well as council tax, thus the council is under pressure to meet a large number of demands within extremely tight budgetary restrictions.

In the area of social services, LGA_SE has employed about 3500 staff to support the service delivery processes in order to protect those who are in need of extra care. In 2005 the authority outlined its Strategic Vision to improve the services towards more than 20,000 vulnerable and disadvantaged or disabled people across the county focusing on five business targets: improving life chances, making the county safer, supporting social carers, promoting independence and protecting vulnerable people. To achieve this, the senior management in LGA_SE focused on a network of seven services areas; four services areas (i.e. The Directorate, Commissioning, Resources and Inspection and Regulation) to deal with the development of social care at the strategic level and the remaining three areas (i.e. Children Services, Adult Services and Local Services and Community Care) to fulfil the operational roles through the provision of services to the community. In spite of delineating the vision statement, the performance of the Children and Young Services Department received the scale of “1” (i.e. insufficient performance) by the Audit Commission’s Comprehensive Performance Assessment¹ (CPA). This indicates that services for vulnerable children and young people do not meet minimum requirements and safeguarding is inadequate.

Prior to presenting the case study and findings, in the next two sections, the researcher describes the state of the LGA_SE IT infrastructure as well as the motivations for EIS within the authority’s departments.

¹ In the UK, the Audit Commission inspects and assesses the performance of every LGA department and their services every year. The results are published through a report called Comprehensive Performance Assessment.

5.3.2 Background to LGA_SE IT Infrastructure

Integrating children services across an LGA represents a transformational change in the way that the authorities' departments capture and manage information about children. As a result, developing and implementing any system to support the integration, in many cases, requires significant investments in technology; hence business processes reengineering. In LGA_SE, the interviewees mutually agreed on the fact that on-going development and upgrading of the IT systems and infrastructure, application of regulatory changes and the corporate core-functions must be considered in the planning of the children service delivery.

As it is depicted in Figure 5-4, each department within the authority has developed and utilised several distinct corporate systems. As an example, in the Education Services Department six different systems including Independent School CMS and School Information Management System have been utilised, while in the Health Services Department five corporate systems including GP Systems and Local Health System have been employed. These systems are provided by different suppliers with different data platform, data repositories and network arrangements.

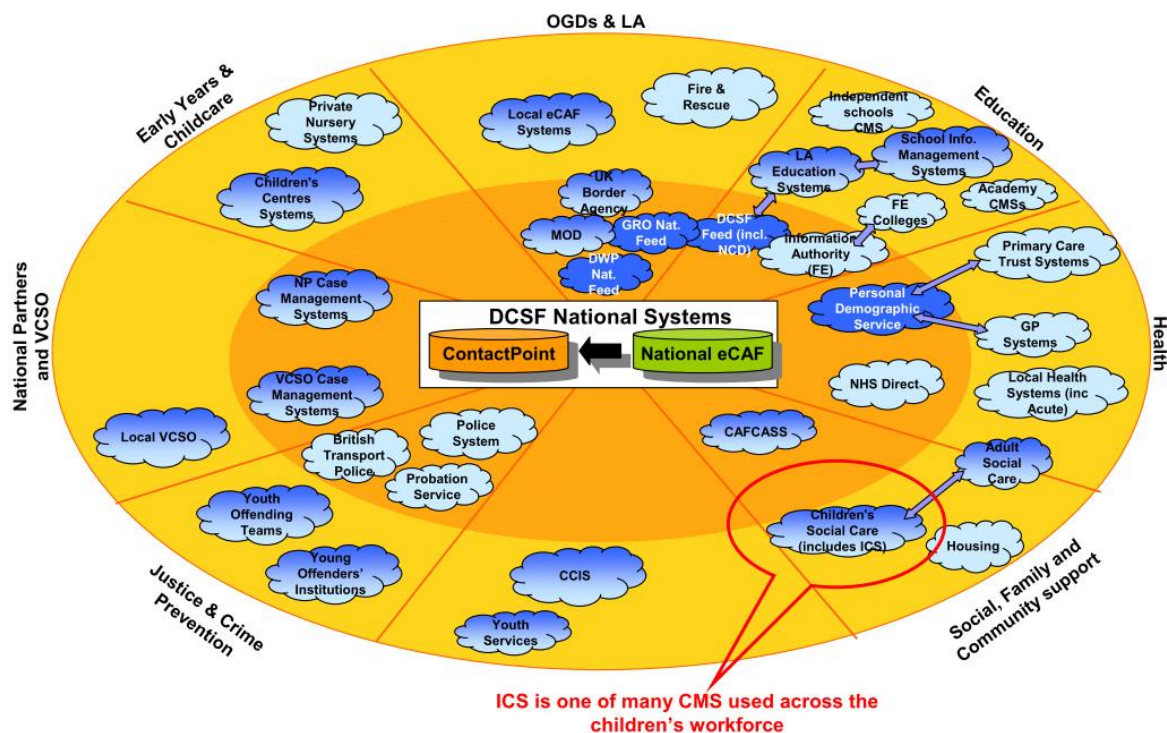


Figure 5-4: Corporate Systems across the Departments at LGA_SE

This illustrates that the LGA's IT infrastructure is extremely fragmented and not capable of

delivering efficient services as these heterogeneous systems cannot share information securely, effectively and on a regular basis.

The Information Sharing Officer (ISO) in the ICT Department stated that:

“... A foundation to establish an integrated platform to support joined-up citizen-centric service delivery is absent ... each department runs their own corporate and legacy systems, hence, the authority is faced with significant problems in order to meet the internal business activities ...”

On a similar note, the Housing Services Support Manager (HSSM) discussed that:

“... There is a good intention to confiscate duplicate data, information storage and rationalise the data sources across the authority. However, our network and data infrastructure, in my view, is outdated and cannot support such an initiative ...”

The senior management at LGA_SE realised that inter-departmental collaboration through an integrated platform is inevitable for improving the processes of children service delivery, hence, restructuring the IT infrastructure of the departments involved in the activity. Therefore, the ICT department was selected to undertake two main audits in relation to IT provision and staff skills; firstly, the current IT systems were reviewed to assess the extent to which existing systems were compatible with the data structure required for an integrated children system and to identify the financial resources to undertake the necessary changes; secondly, the IT skills of staff across the departments involved in children services were audited to assess the level of IT skills as well as identify which team member had key skills and could be used as the champion to support other team members.

The audits took place across three departments; Social Services Department, Housing Services Department and Education Services Department. The report of the audits concluded that all departments have the potential to undertake service delivery through inter-departmental collaboration, but the current IT systems must be restructured to meet the requirements of an integrated system. Based on the suggestions of the ICT Department, LGA_SE entered into a development partnership with a multi-national IT vendor. The official believed that it would be more cost effective and result in a better quality which would be more sustainable over time.

5.3.3 Motivation for Electronic Information Sharing in LGA_SE

One of the key motivations for implementation and adoption of IOS to share information electronically in LGA_SE was the budget pressure imposed by the Central Government. Since 2009, most of the local authorities across the country started to take a strategic approach to the budget deficit. The senior officials in LGA_SE proposed a few alternatives in order to cope with the extensive budget cuts and to address the Central Government's wish to protect frontline services. These approaches mainly focused on transforming the back office processes to establish flexible working, network collaboration and inter-departmental shared services. The ISO stated that:

"... The 28% cuts mean that the scope and shape of public services could look very different in the short term ... the important prerequisite in moving towards the strategic approaches is information sharing ... the future will depend on how well we enable information to be shared while dealing with issues such as security and sustainability ..."

Based on the above declaration, the economic situation in United Kingdom demands change. None of the approaches to transforming the local service delivery would be viable without a solid foundation that facilitates information sharing across the authority. However, departments within LGA_SE follow a traditional project-based service delivery approach. In this situation, each department focuses on specific areas of work and/or systems in which coalition and collaboration is at the lowest level. Although many of these operations have been successful on their own, the authority's officials believe that they are not cost-effective and required to be re-engineered in order to save money. The Information Officer argued that:

"... Each of the major service areas within the authority has their own corporate systems provided by a variety of third party suppliers. As a result, the processes across front and back office cannot be effectively integrated ..."

Moreover, the Record Manager in the Education Services Department (ERM) mentioned that inability of sharing information across the authority has had negative business effects such as: time loss (i.e., rework, chasing down errors, delays to caseworks), staff morale down (i.e., retention and motivation issues) and financial cost (i.e., fixing errors, additional training). It can also be argued that since multiple legacy systems store and process data for the same

entity, the management team has not been able to retrieve the most updated data, hence, the decision-making process has been immensely slow.

Another important factor that motivated LGA_SE officials to focus more on information management in inter-departmental collaboration, especially in social services, was the agenda recommended by the Central Government Social Work Task Force (HM Government, 2010). This agenda focused on a comprehensive reform plan for the social work profession across the local authorities in the UK. It was intended that this programme improve both the quality and capacity of the social worker through inter-departmental collaboration and put in place a sustainable system within which the employees get the necessary support and which allows the profession to take more responsibility for establishing and maintaining high quality and effective processes.

In the next section, the researcher describes how LGA_SE utilises an integrated IT-based system to facilitate information sharing across three departments involved in children services to reduce the operational cost while improving quality and security.

5.3.4 Description of the Case: Integrated Children System (ICS)

As part of the transforming agenda in LGA_SE, the senior management placed increasing emphasis on improving the quality of social services and enhancing outcomes for children especially those who are considered to be most vulnerable. The reforms initiated in 1996 when with the support of the Central Government's Department of Health, LGA_SE established a programme called "Looking After Children: Good Parenting, Good Outcomes" (Cleaver *et al.*, 2008). As a result of this programme, several dimensions of children's development needs were identified to be critical to achieving satisfactory outcomes. The programme included a series of age-related schedules across the identified dimensions as well as other materials to be utilised to assess, record and review children's progress. However, 2 years after developing this programme, inspection reports provided worrying information about the extent to which children, where there were unmet needs, were being referred to the child protection process and then filtered out based on inadequate and poor quality data.

The LGA's officials response was to establish a new principle for re-structuring children services so they would become more broadly based, underpinned by strategies that services should be needs-led. Therefore, in 2001, a conceptual process was developed for understanding what was happening to children in need within the context of their families, to

be used in a structured and systematic way to gather information, analyse and record it, as the foundation for effective planning and intervention. The framework was updated in 2006 in order to be more aligned with the *Children Act 2004*. As it is illustrated in Figure 5-5, the assessment framework is divided into several steps such as initial assessments, core assessments, strategy discussion, and it aims to:

- provide a common understanding of children's needs for all practitioners working with them and their families;
- ensure appropriate referral;
- ensure that evidence is consistently recorded to high, credible standards;
- facilitate the service delivery more effective

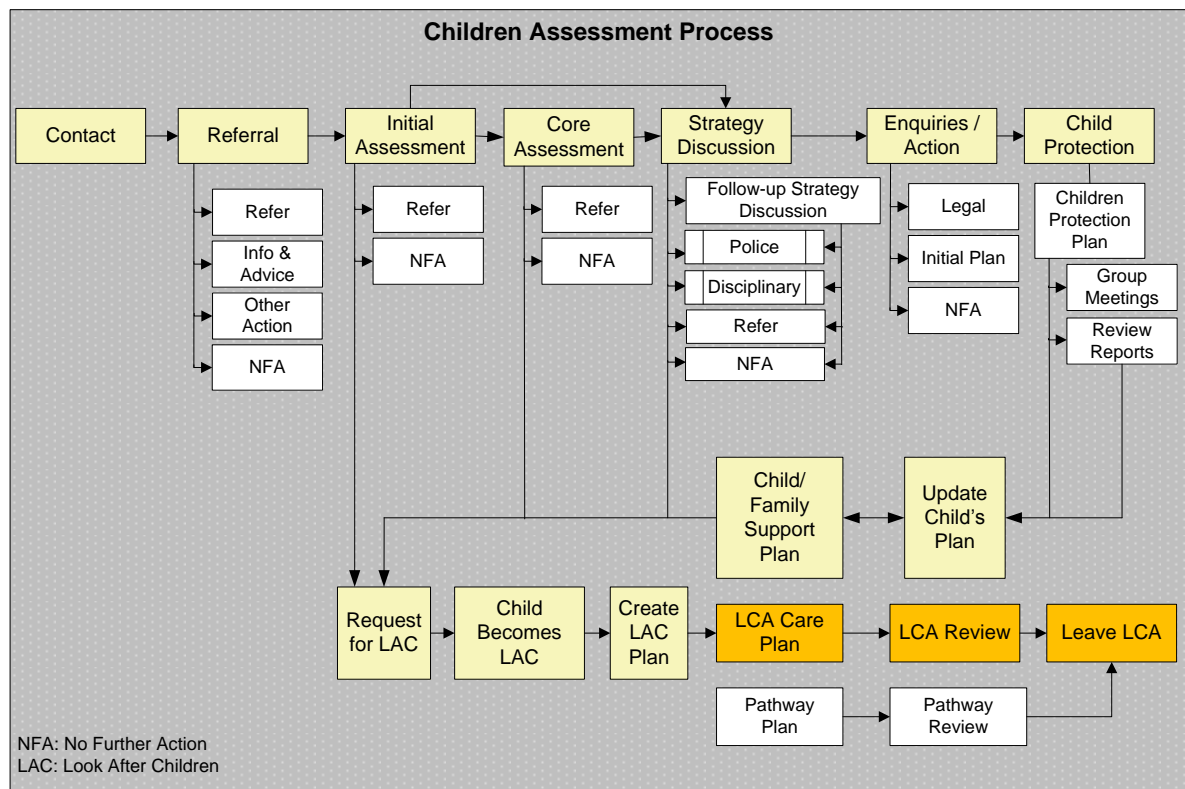


Figure 5-5: Children Assessment Framework at LGA_SE in 2006

Throughout the development of the framework, there was a strong theme about the importance of enhancing information sharing within the departments involved in children services. As the data for the children assessment framework has to be collected from several departments, collaboration was an inevitable factor. However, by the time when the

assessment framework was established, all processes including information exchanges and authorisations were manual and paper-based. As an example, for any support plan, basic data about a child and parents should be collected through the Social Services and Housing Services Department while data regarding the child's school, teachers had to be collected through the Education Services Department. The procedure had several fundamental problems in terms of the gathering, storing and sharing of information across the department. Consequently, it was extremely slow, inefficient and risky.

The senior management at LGA_SE soon realised that an integrated IT-based solution that would improve social care practice and service across its supper spare population with more than 118,000 under the age of 18 was inescapable. The Councillor worked closely with senior staff from the ICT department to find an IT-based solution that could provide full electronic visibility and control into its care planning and case management across the county, with minimum disruption to its 700 social practitioners. In December 2010, LGA_SE signed a contract with a multinational software company to develop and implement the Integrated Children System (ICS).

ICS is an integrated system that is regulated in terms of the Data Protection Act 1998 and Children Act 2004. The system enables the flow of information, in a secure environment, between the services providers across all professional disciplines involved in the provision of health and social care at LGA_SE. The intention is that the ICS will provide the authority with a comprehensive system for collecting information about children in need who are in receipt of service by providing a single approach to undertaking the processes of assessment, planning, intervention and reviewing. The architecture of the system is illustrated in Figure 5-6. As it can be observed from this figure, the system is comprised of three key elements:

1. The assessment framework for planning, intervention and reviewing, providing a single coherent approach for undertaking these key processes of working with children in need. The process within this framework is the computerised version of the processes illustrated in Figure 5-5.
2. Sets of data provided by six corporate systems within the three departments involved in children services delivery, including: Children and Families Record, Mental Health and Learning Disability Records and Social Worker Records by the Social Services Department, Education Inclusion by the Education Services Department and Housing

Records by the Housing Services Department. These data contribute both to individual case planning and to the overall information required to plan and deliver children's services.

3. Case Management System (CMS) as the main hub between the front and back office to assist LGA_SE in developing the e-social care records for children.

All procedures are fully integrated with the two systems below at the national level:

- ***Electronic National Common Assessment Framework (eCAF)***, which is an IT-based assessment and planning framework across all children's services at the national level. It aims to help the early identification of children and young people's additional needs and promote co-ordinated service provision to meet them. The CAF consists of a pre-assessment checklist to help decide whether a child/young person would benefit from a common assessment, a process to enable practitioners in the children's workforce to undertake a common assessment and then act on the result, a standard assessment form and a standard delivery plan and review form.
- ***Contact Point*** which is an online directory that provides a quick way for authorised practitioners to find out who else is working with the same child. It is a critical tool to help improve the wellbeing of all children, keep them safe and to ensure that no child slips through the net of support services. It contains only basic identifying information for each child in England up to their 18th birthday, contact details for their parents or carers and practitioners working with a child. It does not and will not hold any case information (for example, case notes, assessments and medical data).

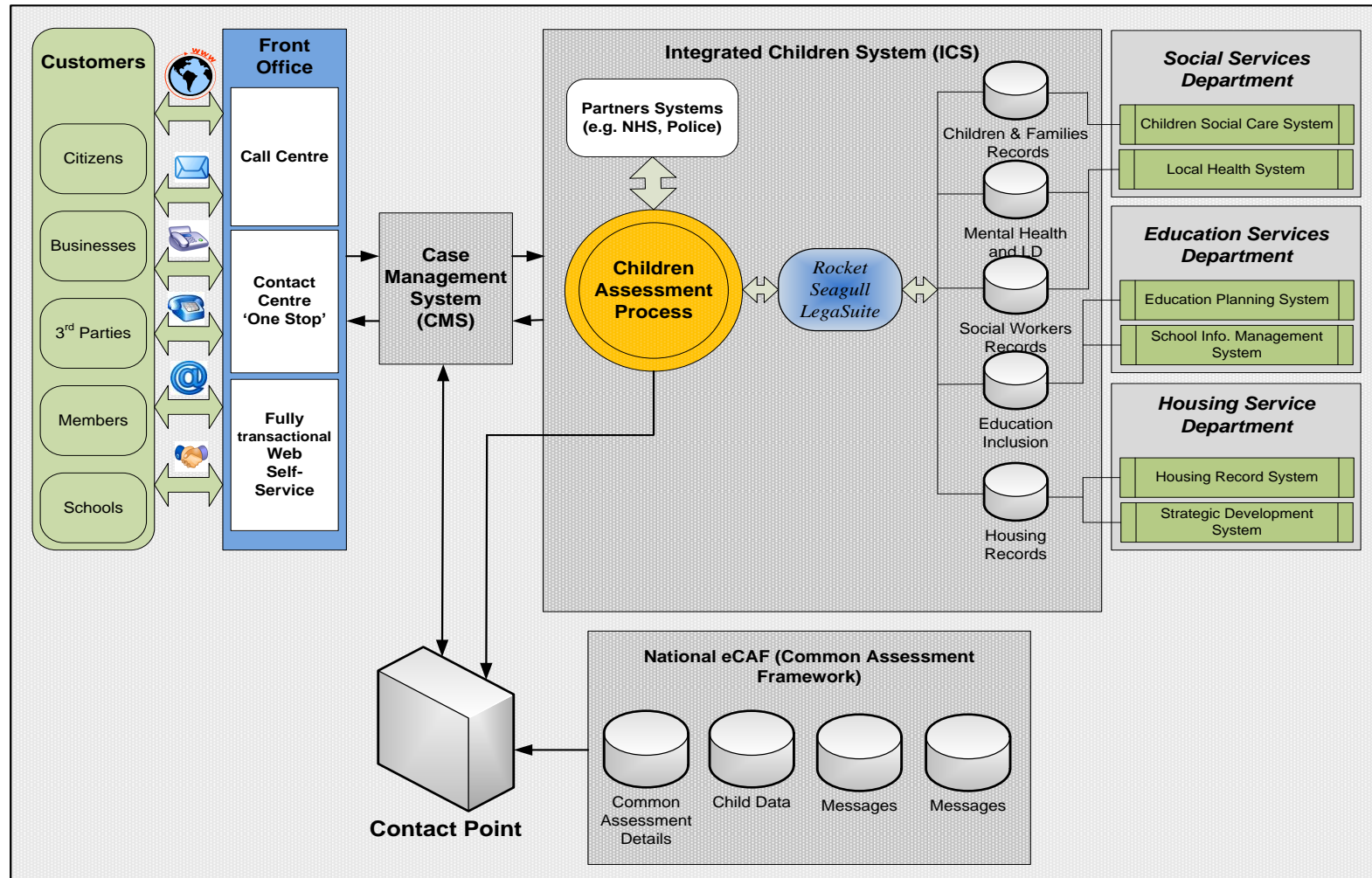


Figure 5-6: Architecture of the Integrated Children System in LGA_SE

The frontline officers, through the communication channels, collect information about children and their families and create a new case in the CMS. This information is automatically checked with the national online directory (i.e., Contact Point) to see if anyone else across the country is working on the same case. Afterwards, the data will go through the children assessment process by a manager or senior practitioner within the Social Services Department. Generally, the process cannot move on to the next stage until input of last stage is finalised. Exceptions to this are core assessment and LAC which can be started at any time after initial assessment (in urgent situations the initial assessment may have to be no more than a few words). Records are checked and aligned with the five database fed by the three departments. All transactions in each stage including notes, decisions and actions are recorded automatically with data, time and the name of the responsible officer(s). Information flows across the system till the last stage of the assessment process. Once a record is finalised it cannot be altered without authority of a manager. When a decision is made and finalised, the CMS database and the eCAF will be updated and the results will be sent back to the citizen through the communication channels.

Similar to the previous case study, the findings for the ICS project will be discussed in two parts based on (1) information sharing context and (2) the four research propositions.

5.3.5 LGA_SE Case Study Findings 1: Information Sharing Contexts

In this section, the researchers summarises the findings of the ICS project in LGA_SE based on the Technology Solution, Organisational/Business Process, Inter-organisational Settings and Policy and Social Environment.

- **Technology Solution:** The findings of the project illustrate that after realising the need of an integrated system to support the children services, there was confusion among LGA_SE officials over selecting the right solution. The reason was that the solutions by those suppliers who had the ability of developing and implementing children integrated services were diverse. Some solutions were based on database oriented middleware, while others were designed on a message oriented platform, or distributed object technology. Hence, the decision of selecting the most effective solution became complex. The SSPM discussed that:

“... In order to place the child at the heart of care planning in LGA_SE, we were

looking for a cost effective ICS solution that would enhance the output for children across the entire county. It was also vital that the ICS solution would be capable of integrating in real time with our existing social care, education and housing systems maximising our IT investment and efficiency of staff ...”

The final decision on selecting the right solution was made by the Head of ICT Department based on 6 criteria underpinned by 10 principles summarised in Figure 5-7. With regards to this, the ISO clarified that the solution from [THE PROVIDER] was selected due to the child-centred nature of the system and the clear, intuitive workflow processes, which support good practice and facilitate consistency across the county.

To ensure that the ICS system is integrated with LGA_SE’s existing Social Care databases, the Rocket Seagull LegaSuite application was chosen to provide ‘robotic control’ between the LGA’s legacy systems and the ICS. By acting as an integration platform that sits on top of LGA’s Children Social Care application, case information can be migrated in real-time to and from the Integrated Children’s System.

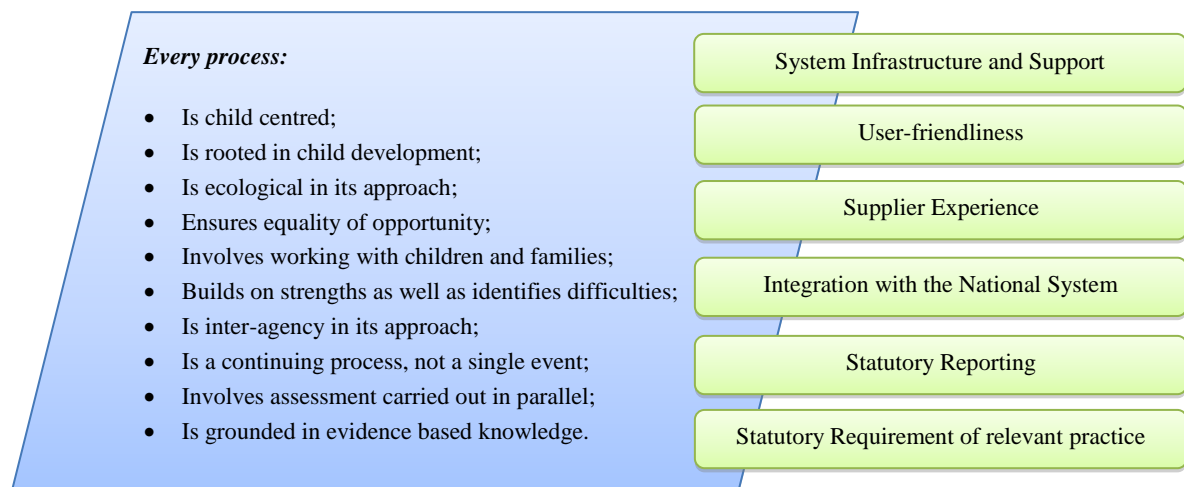


Figure 5-7: Criteria and Principles for Selecting the Solution at LGA_SE

Moreover, the findings exemplify that during the implementation, huge emphasis was placed on inputting clean data into the ICS from the previous data sets. The project team at LGA_SE felt very strongly that if significant effort were put into this, the go-live would be a success. Therefore, six data support officers were appointed who were responsible for the inspection of data quality improvement and data migration reviews. In total, there were six test data

migrations over a nine-month period. Regarding the information migration, the ISO indicated that:

“... Those migration tests enabled us to address many of the data quality issues. Although they were time-consuming, they contributed extensively to the success of the entire process ...”

- **Organisational/Business Process:** It is vital to recognise that the ICS represents more than just a technological solution. However, according to the findings, LGA_SE’s departments did not pay much attention to this issue. A common error, particularly in the early stages of the ICS implementation, was a focus by most of the senior managers on a technological solution alone, when attention was also required in other areas such as improvement of assessment and recording practice, caseload management, performance management, training and communication.

LGA_SE realised that there were some significant issues around the implementation, especially whether or not the processes and data structure in the system matched current business activities. Therefore the authority did not move towards the initial implementation plan as the departments started to focus on the way they were managing their case load. Working in partnership with the third party system provider, LGA_SE went through a detailed business process mapping exercise, system testing and staff consultation in order to ensure that the integrated system mirrored its current manual case management process. The Project Manager in the Social Services Department stated that:

“... In order to minimise disruption to the social practitioners, it was critical to ensure that the electronic integrated system works in the same way as the manual process. To reduce the time and cost of the transition to ICS, it is essential that the system is intuitive and simple to use, supporting practice and case record keeping from case referral to case closure ...”

During the discussions, furthermore, poor business process management was highlighted as a major constraint to sharing information via ICS. The interviewees agreed on the point that a key challenge is not the integration of the corporate systems itself, but the integration of the business processes across the departments using those systems. The ISO discussed that:

“... A key area that we have invested in, that is new, is not technology based but is change management. When co-operative working among departments is in focus, we have to take a look at the people who work in those departments, the management of people and the way they reach their business goals. In our organisation, there are people who cannot cope well in situations of interaction and there are managers who are frightened of promoting collaboration. These issues are nothing to do with IT infrastructure, using IT-based systems, etc. ...”

- **Inter-organisational Settings:** Although the implementation of the ICS did not introduce any new legislative or policy requirements, it did involve in several changes in the way that the departments collect, record, organise and share information in relation to individuals and group of children, that is, a change to the core business of the LGA.

The findings of the ICS project show that as a result of differences in size, structure and management style of each department within LGA_SE, integrating the business processes became a lengthy mission. The Information Sharing Officer (ISO) argued that:

“... The Integrated Children System has been designed to enable the departments to work together, share information more easily and facilitate referrals between them. It will benefit children and families by enabling them to understand which department(s) is requesting what kind of information and why. This will help them judge whether they are getting the help they need. However, all these goals and ambitions are far from achievable since our departments cannot establish primary collaborative efforts in the first place ...”

Moreover, the Social Services Department found it difficult to involve other departments in the ICS. Despite inter-departmental meetings and debriefing sessions focusing on how the ICS would affect each section, partner departments tended to think that it only have implications for children’s services. Therefore, the senior management convened an ICS Steady State Group, which meets on a periodic basis. The initial composition of the group was: the Assistant Director of Social Services Department, Group Managers (one of whom is the ICS lead), the ICS Project Manager (who has a social work background), ICS IT support worker, Housing Services Support Manager, Education Record Manager, Information Analyst, Local Authority Designated Officer for Child Protection and

Reviewing. At its outset, the group had several purposes:

- Ensure a match between business requirements and system functionality
- Examine and manage the technical problems reported to the supplier (and identify whether technical or practice issues were causing them)
- Identify further issues and areas for development. Potential solutions were developed in an integrated, cross-business way (e.g. potential knock-on effects of solutions on other parts of the business were examined, for example effects on data returns and performance indicators)
- Identify other business needs such as training, the need for practitioner guides or additional IT support. For example users found it difficult to understand the looked after children workflow (relationship between care plans, review reports and outcomes). Training groups were therefore arranged to tackle this knowledge gap, which helped people improve their understanding of this area of ICS.

LGA_SE established initiatives to enhance inter-organisational settings between children's social care and other children's services. For example, the Directorate of Social Services established specific an inter-departmental work group with education and health to explore how the system could support their workers. This resulted in the development of pilot efforts enabling head teachers read-only access to parts of the ICS; an effort that consequently extended to health, with police and probation also expressing an interest in developing pilots. This approach involved considerable commitment from the staff involved in children services and improved the level of information exchange extensively. Therefore, other departments were able to see tangible benefits of being involved in ICS.

- **Policy and Social Environment:** Although the Central Government has issued several policies and regulations to help local authorities work more effectively to meet children's needs through information sharing legally and professionally, the findings of the ICS project show that there seemed to be two distinct criticisms; insufficient detailed guidance and conflicting guidance. The primary criticism by the interviewees was the lack of detailed guidance from the Central Government's Department of Education about the approach that the local authority should take in order to meet the requirement of ICS. The

ISO argued that :

“... In the beginning, we were not sure what is going to be centrally developed and what is going to be done at local level. This brought lots of confusion as we didn't know how we should embed our manual children assessment processes in a computerised system while considering Children Acts and Every Child Matter Strategy ...”

Moreover, the guidance coming from different Central Government bodies was considered, at best, to have been issued without consideration of any existing guidance and at worst, to have been issued in contradiction of that from other departments. The interviewees had different and conflicting legal opinions about when to gain consent, what they can share without gaining consent, what constitutes informed consent and what to do if consent is not given. Concerns focused particularly on cases where worries over the child's health and welfare are not severe but where sharing information may damage the trust between the LGA's social workers and the families requesting support.

The approach taken by LGA_SE was to press ahead with implementing the ICS mainly based on the Children Act 2004. The authority relied on the third party software provider knowledge on integrated systems previously implemented in public sector, as well as the experience of its Social Services' and IT staff. Although this strategy saved LGA_SE time and provided assurance, it was argued by the interviewees that the requirements may change in the light of further and new legal guidance.

ICS Steady State Group, furthermore, recognised that as the project is underpinned by the Assessment Framework and incorporates relevant legislation and statutory guidance, in particular the Children Act 2004, system-specific training is necessary for users from the three departments involved in the ICS. According to this matter, the SSPM argued that

“... If our staff knowledge about the legislative framework is not strong, they will struggle to use and understand the process within the ICS ... the users will be frustrated by the system that could be down to the training they have received ...”

Therefore, when the ICS first implemented, all users went through several system trainings. Selected staff from the IT Services, Social Care Services and Education Services departments were trained and deployed to assist other users within their departments. Also,

the software supplier provided specific training, co-facilitated by team managers, focused on specific areas such as core assessments, risk analysis and recording. The interviewees mutually agreed that these have been successful as the involved departments set the expectations and standards which need to be reached.

5.3.6 LGA_SE Case Study Findings 2: Testing Research Propositions

In this section, in order to validate the proposed conceptual framework for EIS participation in LGAs (presented in Figure 3.6), the researcher presents the case findings based on the research propositions summarised in Table 4-2.

Testing Research Proposition A: Factors Influencing EIS in LGAs

The Social Services Project Manager (SSPM), the Information Sharing Officer (ISO), the Housing Services Support Manager (HSSP) and the Education Record Manager were asked to comment on the importance of the proposed factors influencing EIS regarding the Integrated Children's System in LGA_SE. Their views are summarised in Table 4-17. Unlike the previous case study, (i.e. LGA_NW) the interviewees did not put emphasis on Economic Pressure as a factor influencing EIS in LGA_SE. The reason is that the children services reform plan was among the “high priority” programmes in LGA_SE. Hence, the authority managed to secure a capital grant of £420,000 from the Central Government to develop the initiative. As a result, the authority was not under pressure in terms of shortage of budget for developing and implementing the ICS.

In the capability of organisation category, inter-organisational leadership was identified as the “most important” factor by all interviewees while similar to the results of the previous study, organisation size was not recognised as an influential factor. During the meetings with the interviewees, they argued that consistent leadership is crucial to success, so as the presence of an authoritative voice – the ICS champion. The SSPM stated:

“... The Director of Social Services acted as the inter-organisational leadership for the ICS project. His main objective was to obtain a strategic commitment from the local authority to implement and support the on-going development, evaluation and continuous improvement of ICS ...”

		Factors	SSPM	ISO	HSSM	ERM
EE		Political Pressure (PP)	●	⊙	⊙	●
		Economic Pressure (EP)	⊙	○	○	○
		Legislation and Policy Principles (L&P)	●	●	●	⊙
		Community Pressure (CP)	●	●	●	●
CO		Inter-Organisational Leadership (IOL)	●	●	●	●
		Return on Investment (ROI)	⊙	●	⊙	⊙
		Network Collaboration Culture (CC)	●	●	●	●
		Organisation Size (OS)	○	○	⊙	○
TE		IT Capability (ITC)	●	●	●	●
		Data Security and Privacy (DS&P)	●	●	●	●
		Information Quality (IQ)	⊙	●	⊙	●
		Interoperability Framework (IF)	⊙	⊙	⊙	○
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 5-17: Validation of the Factors Influencing EIS in LGA_SE

Regarding the technology environment category, the interviewees did not recognise the Interoperability Framework as the “most important” factor since they were not quite familiar with the technical aspects of the ICS and how technical standards may ease information sharing across the authority. Moreover, in the EIS category, all of the interviewees were concerned about the risk while they were not that bothered about the benefits of sharing information electronically. The ISO stated that:

“... The departments in LGA_SE are anxious about the risk of sharing information via ICS without knowing what the potential risks are. The employees are neither experienced nor well trained to manage the potential risks. However, it should be said that there is a difficult balance to be struck between the undisputed advantages of information exchange among the departments and the protection of children’s data ...”

In the inter-departmental environment, Critical Mass did not recognise by the majority of the interviewees as a factor influencing EIS in LGA_SE. The main argument regarding this factor was focused on incomparable capacity and diverse business processes in each department. Therefore, they found it difficult to follow the same steps that others passed

through to share information.

Based on the above results and conformity of the factors with moderate and high importance, the researcher stresses that the proposed factors are validated through the ICS project in LGA_SE.

Testing Research Proposition B: EIS Participation Phases

The interviewees were asked to illustrate their opinion on the importance of the participation phases based on the ICS project. They mutually agreed that the ICS project team came across these phases. The importance of each phase is presented in Table 4-18.

Participation Phases	SSPM	ISO	HSSM	ERM
Incentive	●	●	●	●
Conception	●	⊙	●	●
Proposal	⊙	⊙	●	●
Participation Decision	⊙	⊙	●	●
Sustainability	●	●	⊙	⊙

Table 5-18: The Importance of the Participation Phases in ICS Project

Prior to the implementation of the ICS, each department formed user groups to obtain and discuss users' perceptions of sharing information through an integrated system. In order to identify the need of information sharing and develop the action plan, the Social Services Department recommended that the authority break down the effort into specific functional areas of the children assessment process (e.g., contact and referral, initial and core assessment and child protection plan). As a result of this breakdown, each department recognised each phase of the assessment in which they are required to be involved and share information with others. Hence, they became able to plan for the best suitable outcome.

To assess the sustainability of sharing information through the ICS, the authority commissioned a post-implementation review which was undertaken by the strategy and performance manager. This review included producing a questionnaire for all staff to complete and return comments/views on the use of the ICS. It covered areas like technology, performance, using the exemplars, how the change was implemented, training, procedures and communication etc. Based on this assessment, each potential improvement was considered based on the implications on the collaboration, time taken to deliver the change, complexity and cost. Based on the above findings, it appears that the participation phases are validated through the Children's Integrated System in LGA_SE.

Testing Research Proposition C: Mapping EIS Participation Factors on the Lifecycle

In this case study, similarly to the previous one, the researcher followed the same pattern in which each interviewee was explained how to perform the mapping of the factors to the participation phases. Table 4-19 summarises this mapping for the Integrated Children's System project, which yet again can be attributed to the understanding and knowledge of each interviewee while developing and implementing the project.

Those factors recognised by less than three interviewees will not be considered for further analysis (i.e., prioritisation section). For example, Table 4-20 illustrates the factors with high support in the Incentive phase that will be involved in the prioritisation process.

		<i>Incentive</i>					<i>Conception</i>					<i>Proposal</i>					<i>Participation Decision</i>					<i>Sustainability</i>					
		SSPM	ISO	HSSM	ERM	Results	SSPM	ISO	HSSM	ERM	Results	SSPM	ISO	HSSM	ERM	Results	SSPM	ISO	HSSM	ERM	Results	SSPM	ISO	HSSM	ERM	Results	
Factors																											
EE	Political Pressure	✓	✓	✓	✓	4/4	-	-	-	✓	1/4	✓	-	-	✓	2/4	-	✓	✓	-	2/4	-	✓	✓	✓	✓	3/4
	Economic Pressure	✓	-	✓	✓	3/4	✓	-	-	✓	2/4	✓	-	-	✓	2/4	✓	-	-	✓	2/4	-	✓	-	-	-	1/4
	Legislation and Policy	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	-	-	-	✓	1/4	✓	-	-	✓	2/4	✓	-	✓	✓	✓	3/4
	Community Pressure	-	✓	✓	✓	3/4	✓	✓	✓	-	3/4	-	✓	✓	-	2/4	✓	-	-	-	1/4	✓	✓	✓	✓	✓	4/4
CO	Inter-Org. Leadership	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	-	✓	✓	✓	✓	3/4
	Return on Investment	-	✓	✓	✓	3/4	-	-	-	✓	1/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	-	✓	✓	-	-	2/4
	Network Coll. Culture	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	-	✓	✓	3/4	✓	✓	✓	✓	✓	4/4
	Organisation Size	✓	-	-	-	1/4	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	✓	-	✓	3/4	-	-	-	✓	-	1/4
TE	IT Compatibility	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	✓	✓	-	3/4	✓	✓	-	✓	3/4	-	✓	-	-	-	1/4
	Data Security & Privacy	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	✓	4/4
	Information Quality	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	✓	4/4
	Inter. Framework	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	✓	-	-	✓	2/4	✓	-	-	✓	2/4	✓	✓	✓	-	-	3/4
EIS	Cost of EIS	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	-	✓	-	-	-	1/4
	Benefit of EIS	-	-	✓	✓	2/4	✓	✓	-	-	2/4	✓	-	-	✓	2/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	✓	4/4
	Risk of EIS	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	-	✓	-	3/4
IDE	Business Process Com.	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	-	-	3/4
	Inter-departmental Trust	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	✓	4/4
	Critical Mass	✓	✓	✓	-	3/4	-	-	-	-	0/4	✓	-	✓	✓	3/4	✓	-	✓	✓	3/4	-	-	-	✓	-	1/4

Table 5-19: Mapping of the EIS Factors to the Participation Phases for the ICS Project

		Incentive Phase				
		Factors	SSPM	ISO	HSSM	ERM
EE	Political Pressure	✓	✓	✓	✓	
	Economic Pressure	✓	–	✓	✓	
	Legislation and Policy	✓	✓	✓	✓	
	Community Pressure	–	✓	✓	✓	
CO	Inter-Org. Leadership	✓	✓	✓	–	
	Return on Investment	–	✓	✓	✓	
	Network Coll. Culture	✓	✓	✓	✓	
TE	IT Compatibility	✓	✓	✓	–	
	Data Security & Privacy	✓	✓	✓	✓	
	Information Quality	✓	✓	✓	✓	
	Interoperability Framework	✓	✓	✓	✓	
EIS	Cost of EIS	✓	✓	✓	✓	
	Risk of EIS	✓	✓	✓	✓	
IDE	Business Process Com.	✓	✓	✓	✓	
	Inter-departmental Trust	✓	✓	✓	✓	
	Critical Mass	✓	✓	✓	–	

Table 5-20: Factors with Moderate or Full Support on the Incentive Phase

Testing Research Proposition D: Prioritisation of EIS Participation Factors on the Participation Phases

As the previous sections were not able to illustrate the priority of each factor in relation to the EIS participation phases, this section ranks the influential factors by using AHP. The prioritisation follows similar procedures to the ones applied in the previous case study, including: decomposition, comparative judgments, determining normalised priority weights and analysing and calculating the priority weights. Tables 5.21 – 5.25 demonstrate the ranking of each factor in their group in relation to the five participation phases.

Incentive Phase					
Factors		SSPM	ISO	HSSM	ERM
EE	Political Pressure	(2) 0.2031	(1) 0.4544	(2) 0.2359	(3) 0.1388
	Economic Pressure	(3)0.1833	(3)0.1567	(3)0.1631	(2)0.2161
	Legislation and Policy	(1)0.5433	(2)0.3102	(1)0.5387	(1)0.5775
	Community Pressure	(4)0.0703	(4)0.0787	(4)0.0622	(4)0.0674
CO	Inter-Org. Leadership	(3)0.1017	(2)0.2430	(2)0.2474	(3)0.2997
	Return on Investment	(2)0.2863	(3)0.1180	(3)0.1078	(2)0.3324
	Network Coll. Culture	(1)0.6119	(1)0.5389	(1)0.6447	(1)0.3678
TE	IT Capabilities	(1)0.3990	(3)0.2902	(3)0.2446	(3)0.1169
	Data Security & Privacy	(4)0.0848	(2)0.3199	(1)0.4665	(1)0.5162
	Information Quality	(3)0.1680	(1)0.3242	(4)0.2104	(2)0.2908
	Interoperability Framework	(2)0.3256	(4)0.0656	(2)0.2514	(4)0.0759
EIS	Cost of EIS	(2)0.2000	(2)0.2500	(1)0.6666	(1)0.6666
	Risk of EIS	(1)0.8000	(1)0.7500	(2)0.3333	(2)0.3333
IDE	Business Process Com.	(1)0.5637	(3)0.2236	(2)0.1415	(2)0.2721
	Inter-departmental Trust	(2)0.3374	(1)0.5597	(1)0.3299	(1)0.6080
	Critical Mass	(3)0.0800	(2)0.2744	(3)0.0596	(3)0.1200

Table 5-21: Priority Weights of the Factor on the Incentive Phase

Conception Phase					
Factors		SSPM	ISO	HSSM	ERM
EE	Legislation and Policy	(1) 0.6666	(1) 0.8000	(2) 0.1666	(2) 0.2500
	Community Pressure	(2) 0.3333	(2) 0.2000	(1) 0.8333	(1) 0.7500
CO	Inter-Org. Leadership	(1) 0.5119	(1) 0.6079	(2) 0.2395	(2) 0.3091
	Network Coll. Culture	(3) 0.1279	(3) 0.1199	(3) 0.1372	(3) 0.1096
	Organisation Size	(2) 0.3601	(2) 0.2721	(1) 0.6231	(1) 0.5812
TE	IT Capabilities	(1) 0.4810	(2) 0.2457	(3) 0.1426	(3) 0.2103
	Data Security & Privacy	(2) 0.2360	(1) 0.4969	(1) 0.4471	(4) 0.1547
	Information Quality	(4) 0.0838	(3) 0.1417	(2) 0.3432	(2) 0.5590
	Interoperability Framework	(3) 0.1989	(4) 0.1152	(4) 0.0669	(1) 0.0758
EIS	Cost of EIS	(1) 0.7500	(1) 0.6666	(1) 0.8000	(1) 0.6666
	Risk of EIS	(2) 0.2500	(2) 0.3333	(2) 0.2000	(2) 0.3333
IDE	Business Process Com.	(1) 0.8333	(1) 0.8000	(1) 0.7500	(1) 0.8333
	Inter-departmental Trust	(2) 0.1666	(2) 0.2000	(2) 0.2500	(2) 0.1666

Table 5-22: Priority Weights of the Factor on the Conception Phase

Proposal Phase						
		Factors	SSPM	ISO	HSSM	ERM
CO		Inter-Org. Leadership	(1)0.5423	(1)0.3122	(1)0.3488	(1)0.4179
		Return on Investment	(4)0.0705	(3)0.2509	(2)0.3223	(4)0.0721
		Network Coll. Culture	(2)0.2484	(2)0.2730	(3)0.2863	(2)0.3755
		Organisation Size	(3)0.1393	(4)0.1637	(4)0.1296	(3)0.1342
TE		IT Capabilities	(2)0.2863	(3)0.1566	(1)0.6079	(1)0.6232
		Data Security & Privacy	(3)0.1017	(1)0.4670	(2)0.2720	(2)0.2395
		Information Quality	(1)0.6119	(2)0.3763	(3)0.0899	(3)0.1372
EIS		Cost of EIS	(1)0.6666	(2)0.2500	(2)0.3333	(1)0.7500
		Risk of EIS	(2)0.3333	(1)0.7500	(1)0.6666	(2)0.2500
IDE		Business Process Com.	(1) 0.5119	(2) 0.2618	(1) 0.5869	(1) 0.5321
		Inter-departmental Trust	(2) 0.3601	(1) 0.6583	(2) 0.3237	(2) 0.3606
		Critical Mass	(3) 0.1279	(3) 0.0797	(3) 0.0893	(3) 0.0763

Table 5-23: Priority Weights of the Factor on the Proposal Phase

Participation Phase						
		Factors	SSPM	ISO	HSSM	ERM
CO		Inter-Org. Leadership	(2) 0.3304	(3) 0.1448	(3) 0.1957	(3) 0.1516
		Return on Investment	(4) 0.0617	(4) 0.0642	(4) 0.0796	(4) 0.0741
		Network Coll. Culture	(1) 0.4825	(1) 0.5833	(1) 0.4549	(1) 0.6067
		Organisation Size	(3) 0.1275	(2) 0.2075	(2) 0.2697	(2) 0.1674
TE		IT Capabilities	(1) 0.5780	(2) 0.2721	(3) 0.1428	(3) 0.1096
		Data Security & Privacy	(3) 0.1200	(3) 0.1199	(2) 0.2857	(2) 0.3091
		Information Quality	(2) 0.3019	(1) 0.6079	(1) 0.5714	(1) 0.5712
EIS		Cost of EIS	(2) 0.2395	(2) 0.2000	(1) 0.4576	(1) 0.5119
		Benefit of EIS	(3) 0.1372	(2) 0.2000	(3) 0.3227	(2) 0.1279
		Risk of EIS	(1) 0.6232	(1) 0.6000	(2) 0.2195	(3) 0.3601
IDE		Business Process Com.	(2) 0.2923	(1) 0.5571	(2) 0.3091	(2) 0.2604
		Inter-departmental Trust	(1) 0.6269	(2) 0.3202	(1) 0.5812	(1) 0.6333
		Critical Mass	(3) 0.0807	(3) 0.1226	(3) 0.1069	(3) 0.1061

Table 5-24: Priority Weights of the Factor on the Participation Phase

Sustainability Phase					
	Factors	SSPM	ISO	HSSM	ERM
EE	Political Pressure	(3) 0.1279	(3) 0.1372	(2) 0.2341	(3) 0.2204
	Legislation and Policy	(1) 0.5119	(2) 0.2395	(3) 0.1865	(2) 0.3058
	Community Pressure	(2) 0.3601	(1) 0.6332	(1) 0.5793	(1) 0.4737
CO	Inter-Org. Leadership	(1) 0.7500	(2) 0.2500	(2) 0.2500	(2) 0.3333
	Network Coll. Culture	(2) 0.2500	(1) 0.7500	(1) 0.7500	(1) 0.6666
TE	Data Security & Privacy	(1) 0.5237	(2) 0.1277	(2) 0.2999	(2) 0.1560
	Information Quality	(2) 0.1721	(1) 0.2827	(1) 0.5043	(1) 0.2243
EIS	Cost of EIS	(2) 0.3042	(1) 0.5895	(3) 0.2956	(2) 0.6196
	Benefit of EIS	(1) 0.7500	(2) 0.5000	(1) 0.6666	(3) 0.3333
	Risk of EIS	(3) 0.2500	(3) 0.5000	(2) 0.3333	(1) 0.6666
IDE	Business Process Com.	(2) 0.2500	(2) 0.2000	(2) 0.3333	(1) 0.6666
	Inter-departmental Trust	(1) 0.7500	(1) 0.8000	(1) 0.6666	(2) 0.3333

Table 5-25: Priority Weights of the Factor on the Sustainability Phase

Consequently, the global weights of the factors on each phases of EIS are respectively summarised in Tables 5.26 – 5.30. The weights are calculated by aggregating the values of each factor and dividing the results by the number of interviewees.

Incentive Phase			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Risk of EIS	0.5541
2	Capacity of Organisation	Network Collaboration Culture	0.5408
3	External Environment	Legislation and Policy Principles	0.4924
4	Inter-departmental Env.	Inter-departmental Trust	0.4587
5	EIS Characteristic	Cost of EIS	0.4458
6	Technology Environment	Data Security and Privacy	0.3468
7	Inter-departmental Env.	Business Process Compatibility	0.3009
8	Technology Environment	IT Capabilities	0.2627
9	External Environment	Political Pressure	0.2580
10	Technology Environment	Information Quality	0.2483
11	Capacity of Organisation	Inter-organisational Leadership	0.2229
12	Capacity of Organisation	Return on Investment	0.2111
13	External Environment	Economic Pressure	0.1798
14	Technology Environment	Interoperability Framework	0.1796
15	Inter-departmental Env.	Critical Mass	0.1335
16	External Environment	Community Pressure	0.0697

Table 5-26: Ranking of the Factors in the Incentive Phase

<i>Conception Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Business Process Compatibility	0.8041
2	EIS Characteristic	Cost of EIS	0.7208
3	External Environment	Community Pressure	0.5191
4	External Environment	Legislation and Policy Principles	0.4708
5	Capacity of Organisation	Organisation Size	0.4591
6	Capacity of Organisation	Inter-organisational Leadership	0.4171
7	Technology Environment	Data Security and Privacy	0.3343
8	Technology Environment	Information Quality	0.2819
9	EIS Characteristic	Risk of EIS	0.2791
10	Technology Environment	IT Capabilities	0.2699
11	Inter-departmental Env.	Inter-departmental Trust	0.1958
12	Capacity of Organisation	Network Collaboration Culture	0.1236
13	Technology Environment	Interoperability Framework	0.1142

Table 5-27: Ranking of the Factors in the Conception Phase

<i>Proposal Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Risk of EIS	0.5000
2	EIS Characteristic	Cost of EIS	0.5000
3	Inter-departmental Env.	Business Process Compatibility	0.4732
4	Inter-departmental Env.	Inter-departmental Trust	0.4257
5	Technology Environment	IT Capabilities	0.4185
6	Capacity of Organisation	Inter-organisational Leadership	0.4053
7	Technology Environment	Information Quality	0.3038
8	Capacity of Organisation	Network Collaboration Culture	0.2958
9	Technology Environment	Data Security and Privacy	0.2700
10	Capacity of Organisation	Return on Investment	0.1789
11	Capacity of Organisation	Organisation Size	0.1417
12	Inter-departmental Env.	Critical Mass	0.0933

Table 5-28: Ranking of the Factors in the Proposal Phase

<i>Participation Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Inter-departmental Trust	0.5404
2	Capacity of Organisation	Network Collaboration Culture	0.5318
3	Technology Environment	Information Quality	0.5131
4	EIS Characteristic	Risk of EIS	0.4507
5	Inter-departmental Env.	Business Process Compatibility	0.3547
6	EIS Characteristic	Cost of EIS	0.3521
7	Technology Environment	IT Capabilities	0.2756
8	Technology Environment	Data Security and Privacy	0.2086
9	EIS Characteristic	Benefits of EIS	0.1969
10	Capacity of Organisation	Organisation size	0.193
11	Capacity of Organisation	Inter-organisational Leadership	0.1677
12	Inter-departmental Env.	Critical Mass	0.1040
13	Capacity of Organisation	Return on Investment	0.0699

Table 5-29: Ranking of the Factors in the Participation Phase

<i>Sustainability Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Inter-departmental Trust	0.6375
2	Capacity of Organisation	Network Collaboration Culture	0.6041
3	EIS Characteristic	Benefits of EIS	0.5625
4	External Environment	Community Pressure	0.5115
5	Technology Environment	Interoperability Framework	0.4522
6	EIS Characteristic	Risk of EIS	0.4375
7	Capacity of Organisation	Inter-organisational Leadership	0.3958
8	Inter-departmental Env.	Business Process Compatibility	0.3625
9	External Environment	Legislation and Policy Principles	0.3109
10	Technology Environment	Information Quality	0.2958
11	Technology Environment	Data Security and Privacy	0.2768
12	External Environment	Political Pressure	0.1799

Table 5-30: Ranking of the Factors in the Sustainability Phase

The ranking results will be analysed in Chapter 6 in depth. As discussed earlier, the factors that are mapped by three or four interviewees were prioritised based on their importance in each phase. Five of the factors were either not mapped or received very low rank; Political Pressure, Economic Pressure, Organisation Size, Critical Mass and Benefits of EIS. Other factors and the participation lifecycle phases are tested and validated through the LGA_SE's

ICS project in which they have either directly or indirectly influenced the decision-making process for EIS. This supports the literature findings and validates the EIS conceptual framework presented in Chapter 3. This claim is also subject to analysis of some new factors (e.g., Information Sharing Flowchart and Previous Lessons) and new EIS phases (e.g., Legislative Framework Phase) identified by the interviewees and that will be presented in the next Chapter.

5.4 Case Study III: LGA_LON

5.4.1 Background to LGA_LON

LGA_LON is a Borough of north-west London serving a population of 240,000 people, 86,000 houses in an area of 53 sq/ km. LGA_LON is a diverse Borough, having around 65% of its population from the BME (Black and Minority Ethnic) communities, with the largest group being of Indian ethnicity. The borough is divided into 21 wards, each represented by three councillors. After the most recent council elections in 2012, the borough is currently controlled by the Labour Party. LGA_LON employs around 4800 staff to facilitate service delivery through several departments including Transport Services Department, Planning Service Department and Housing Services Department. In 2010, the council responded to more than 370,200 enquiries via telephone, face-to-face contacts and emails. These, for example, include housing services (41,300 enquiries), resident services (35,030), environmental health (70,545) and planning and building control (28,255).

5.4.2 Background to LGA_LON IT Infrastructure

LGA_LON spends around £7.5m revenue a year on IT across the authority; this is average for London Boroughs. The council has a mixed economy of service delivery with a range of in-house services and numerous contracts with third party suppliers for maintenance and support of systems. In early 2000, LGA_LON had over 180 information systems deployed throughout the authority to facilitate and support all service delivery functions. Those systems operated on several heterogeneous computer platforms, data repositories and data standards. Figure 5-8 illustrates the IT infrastructure in LGA_LON in year 2000. As a result of this diverse infrastructure, the LGA departments had to work in an isolated environment where information sharing effort had to be carried out in a manual and slow routine.

Moreover, redundancy of the citizens' data became a challenge as several legacy systems stored and processed similar data. Due to this data incompatibility, mapping different data representations was considerably time-consuming. The Data Services Manager (DSM) expressed his view that:

“... The need for standardisation of data was inevitable as the data structures in the authority were mismatched, the design of the databases was incompatible and the data distribution channels were inconsistent ...”

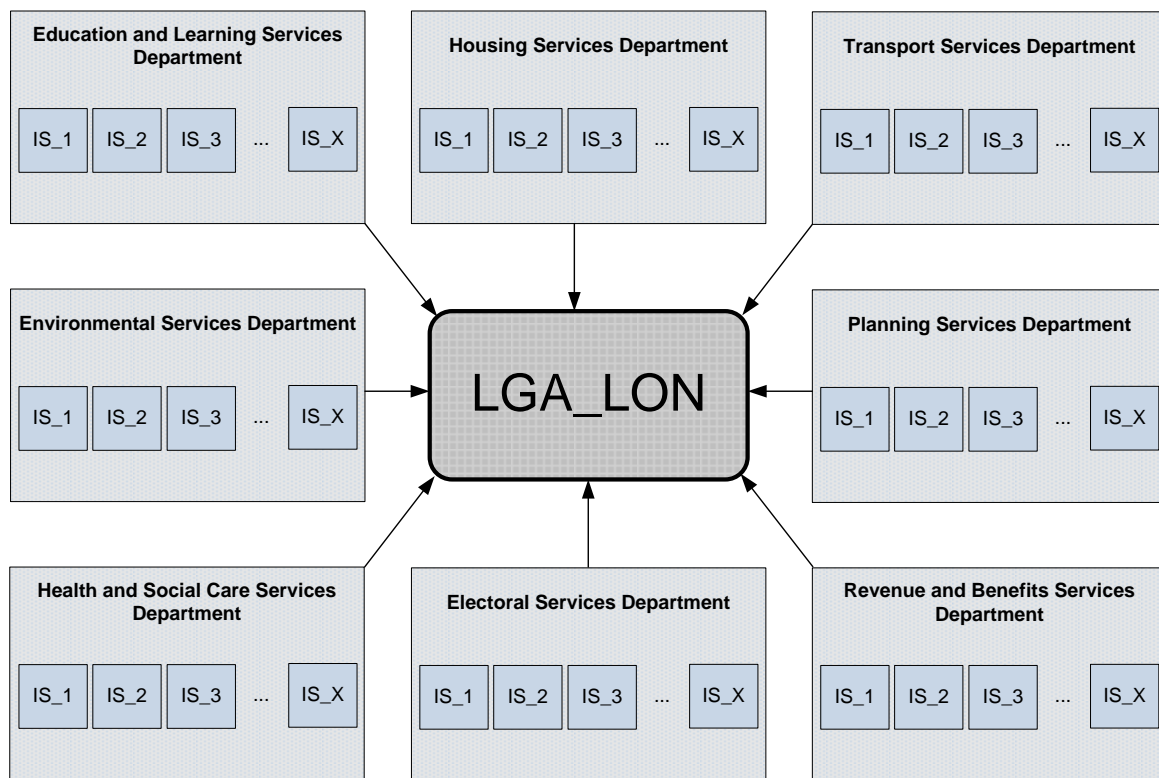


Figure 5-8:Information Systems Infrastructure in LGA_LON in 2000

As most of the interviewees expressed, the day-to-day running of the borough required top-quality frontline customer services and an efficient flow of information across the back-office team. However, the complexity of the authority's IT infrastructure and the structure of the front and back office platforms could not provide the basic means of cooperation between the administrations. LGA_LON traditionally left it to individual departments to handle customer services. This meant public reception areas were dotted across the borough with little integration. There were no economies of scale and the staff had to do similar jobs at different locations with little career structure.

The lack of IT capability occurred as a result of the poor IT infrastructure in LGA_LON was identified as an important obstacle for participation in inter-departmental collaboration. Moreover, employing a variety of hardware and running different operating systems and software applications limited the effort of information sharing. The Services Manager in the Planning Services Department stated that:

"... Due to the non-integrated nature of our ICT infrastructure in late 2000, there was no effective communication between departments and sections ... each

department was developing their own corporate system based on their specific requirements and implementing by arrangements with their specific IT suppliers ...”

Moreover, the lack of IT leadership and corporate governance, along with the dispersed responsibility for IT, had resulted in a lack of ownership of IT within LGA_LON. As a result, technical difficulties and unexpected costs occurred when new systems were implemented. Therefore, LGA_LON began to look for an in-house partner to develop and implement integrated IT infrastructure across the authority. In 2005, the authority entered into a strategic partnership with a multinational IT company with a focus of transformation and innovation. LGA_LON collaborated with its partner for the design, configuration and implementation of an integrated IT infrastructure within several departments. Since then, Business Transformation Partnership (BTP) has undertaken a number of major projects with a common theme: enhancing collaboration to increase citizens’ satisfaction while reducing costs.

However, the authority faced several challenges for integrating their IT infrastructure in several departments including Environmental Services Department and Planning Services Department. The senior officials in LGA_LON recognised that in order to escalate the pace and enhance the effectiveness of the integration, front and back office corporate functions should be acknowledged. Therefore, the IT Department with the support of their partner developed the authority’s target business architecture (Figure 5-9). This architecture enabled LGA_LON to analyse their service strategy and the organisational, functional and processes of the corporate environment based on the goals, principles and strategic drivers. It also used as the prerequisite for further organisational processes including business process re-engineering to support different departments in the effort of information sharing.

Developing the target business architecture was the first step towards the organisational reform in LGA_LON. The DSM argued that:

“... The corporate functions were duplicated, misaligned and configured around the convenience of the authority, or they were housed in different layers of our departments. Developing the business architecture helped us identifying the fragments and boundary of each functions. This will support LGA_LON to develop and implement new inter-organisational and service-led operating

models that are focused on the needs of the community ...”

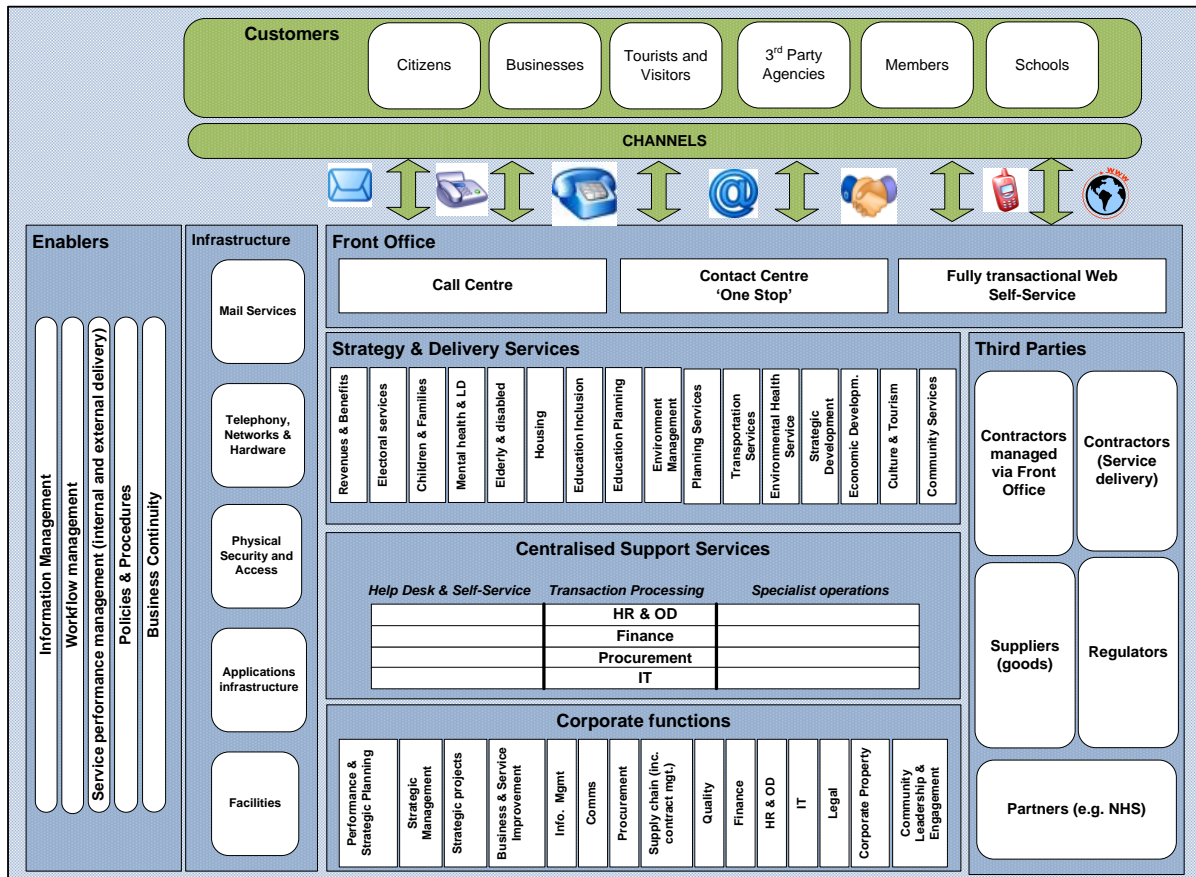


Figure 5-9: Target Business Architecture in LGA_LON

5.4.3 Motivation for Electronic Information Sharing in LGA_LON

In July 2008, LGA_LON drafted its corporate IT strategy to set out a vision for the use of technology to improve customer and community services as well as business efficiency across the authority up to the year 2013. The drivers for the strategy were the Central Government’s Transformational Government Strategy and the Council’s Transformation and Improvement Agenda. One of the important agendas in the IT strategy was to increase emphasis on transformation based on technology, the sharing of information in inter-departmental collaboration and the need for IT to be responsive to restructuring and changing business need.

The council acknowledged that their service delivery was hard to track in the decentralised environment. There was little management of information and therefore the customer service was quite poor. Processes were not much better in the back office. Payroll, finance, human resources (HR) and property services used different software to record similar information.

Systems could not ‘talk’ to each other; hence the information sharing effort was very much ineffective. This led to staff duplicating work and a disjointed service.

This inability of sharing information through an integrated platform resulted in significant data breaches across the authority. For example, in 2009 a member of staff working in the Social Service Department – Adult Social Care Team, e-mailed a file containing information of more than 200 people’s physical and mental health to a wrong group email address. Recipients included several transportation companies such as taxi firms and coach hire services. The authority could not recall the e-mail and was unable to confirm that the receivers had destroyed it. On a similar note, confidential data of a number of individuals mistakenly e-mailed to more than 100 customers who had registered to receive the council newsletter. As a result of these two incidents, LGA_LON received a penalty of £95,000 from the Central Government Information Commissioner’s Office. The DSM stated that:

“ ... This [the penalty] was a serious wake-up call for the authority. Since we did not have any IS integration back then, we were unable to share information in a secure channel where all the transactions are protected so as the citizens’ privacy ... ”

The aforementioned issue led LGA_LON to take a decision to significantly improve information sharing effort across the departments. Based on the analysis of the gaps between the baseline and target business architecture, the authority’s senior officials recognised that the integration of the front and back-office corporate applications should be the first step towards enhancing inter-departmental collaboration. Almost all of the interviewees expressed that the reasons motivated them for developing and implementing an integrated platform across the authority were to reduce the data duplication, enhance the information flow in a protected and encrypted channel and improve the collaboration across the council, which all would lead to cost reduction and citizens’ satisfaction improvement. The feedbacks from a focus group dealing with strategic planning in the LGA_LON showed that integrating council systems to enhance the inter-departmental collaboration and sharing information can save the organisation up to £7.2m over ten years.

5.4.4 Description of the Case: Front/Back Office Integration – Integrated Waste Management (IWM) System

In 2010, the Council decided to scrap existing customer reception areas and create one central service known as ‘Access LGA_LON’. This meant to be a one-stop shop with a call centre, based at the civic centre where different back office processes are combined into one using the business management software SAP. The architecture of the Access LGA_LON is depicted in Figure 5-10.

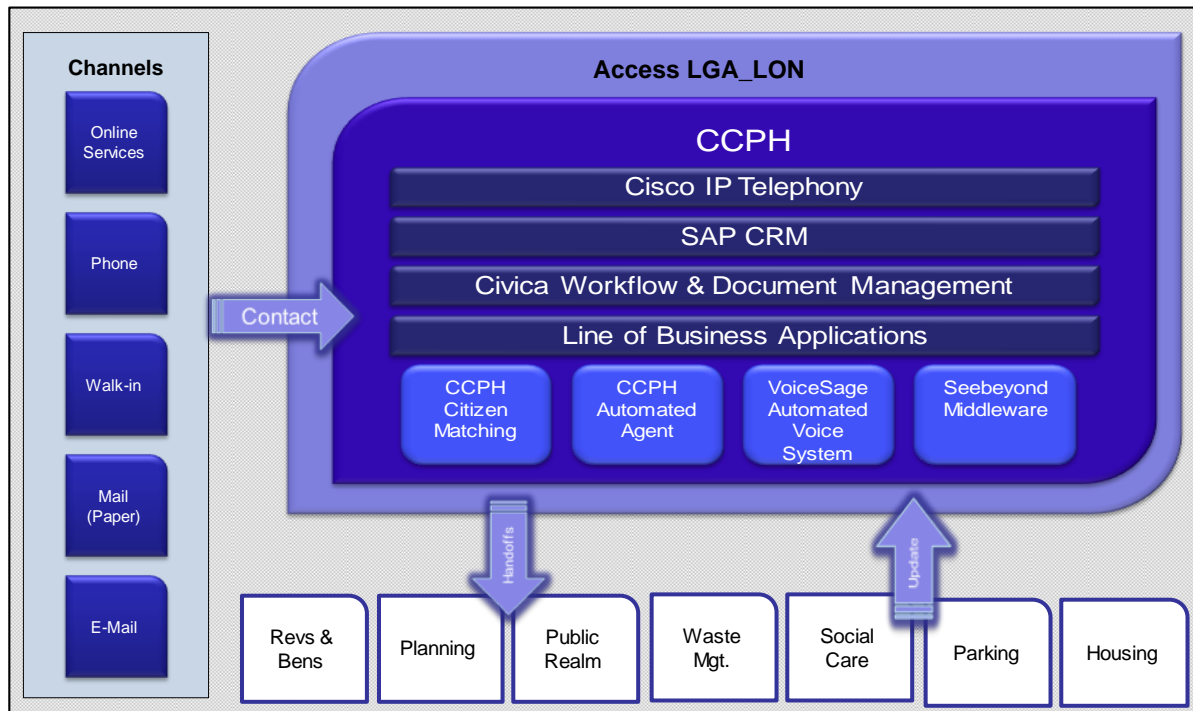


Figure 5-10: Architecture of the “Access LGA_LON”

All contact information feeding from several channels including web-forms, telephone conversations and walk-in requests, enter into the SAP Customer Relationship Management (CRM) system where a record ticket is created. Then the Workflow and Document Management (which is an Electronic Records and Document Management System - EDRMS) is used to create work items linked to the CRM tickets. Thereafter, CCPH systems check the forms/tickets as they are completed and then push the data into relevant back-office corporate systems. Also, where appropriate, the CCPH system creates workflows within the back office systems and automates the start of processes that previously would have started with an e-mail, post or a phone call. The Access LGA_LON is able to deal with about 85% of the business activities across the authority including property tax, revenues and benefits, parking and environmental services, housing repairs, education services and planning and

building controls.

One of the examples of the above workflow is the interaction between the front and back office regarding the authority's waste management. LGA_LON started to collaborate with its IT partner to introduce a waste management system that is integrated with the in-house CRM system through a centralised database. The objective was to overhaul the entire waste collection process in the borough. Therefore, the officials set out the appropriate technological developments to continue the trend of service delivery excellence, epitomised in currently recycling rates of 44%.

Previously, the crews were using several manually coded spreadsheets to collect data, which overload the service with paper and manual processes. This provided very limited information sharing across the departments. The trade and domestic collection routes were set up using manual processes, an outdated practice for a straightforward refuse collection service. The manual collection and processing of data of 165,000 individual collections on a weekly basis from households and around 1,300 schools created significant issues for the authority. For instance, the authority was very slow in responding to citizens' queries regarding their bin collection as the data had to be gathered through several departments in a manual way.

LGA_LON and its partner developed and implemented a traceable and integrated waste management information system that for the first time directly connects collection crews with the CRM system and the Fleet Management Database through GSM/Wireless networks, hence the back-office corporate applications (Figure 5-11).

Each lorry cab has a touch-screen computer with GPS link to the council. Crews on their rounds use this to log various events, e.g. when they start and finish collecting in a specific road. They can even upload pictures of problem areas or contaminated bins. Also, each bin is linked to a Unique Property Reference Number (UPRN) held in the LLPG – the Local Land and Property Gazetteer. This system is wirelessly linked to vehicle cabs and integrates internally with the call centre's CRM. This allows the driver to update collection or missed bin information in real time which is relayed to back office and CRM systems. Both systems independently receive address updates on a daily basis from the LLPG.

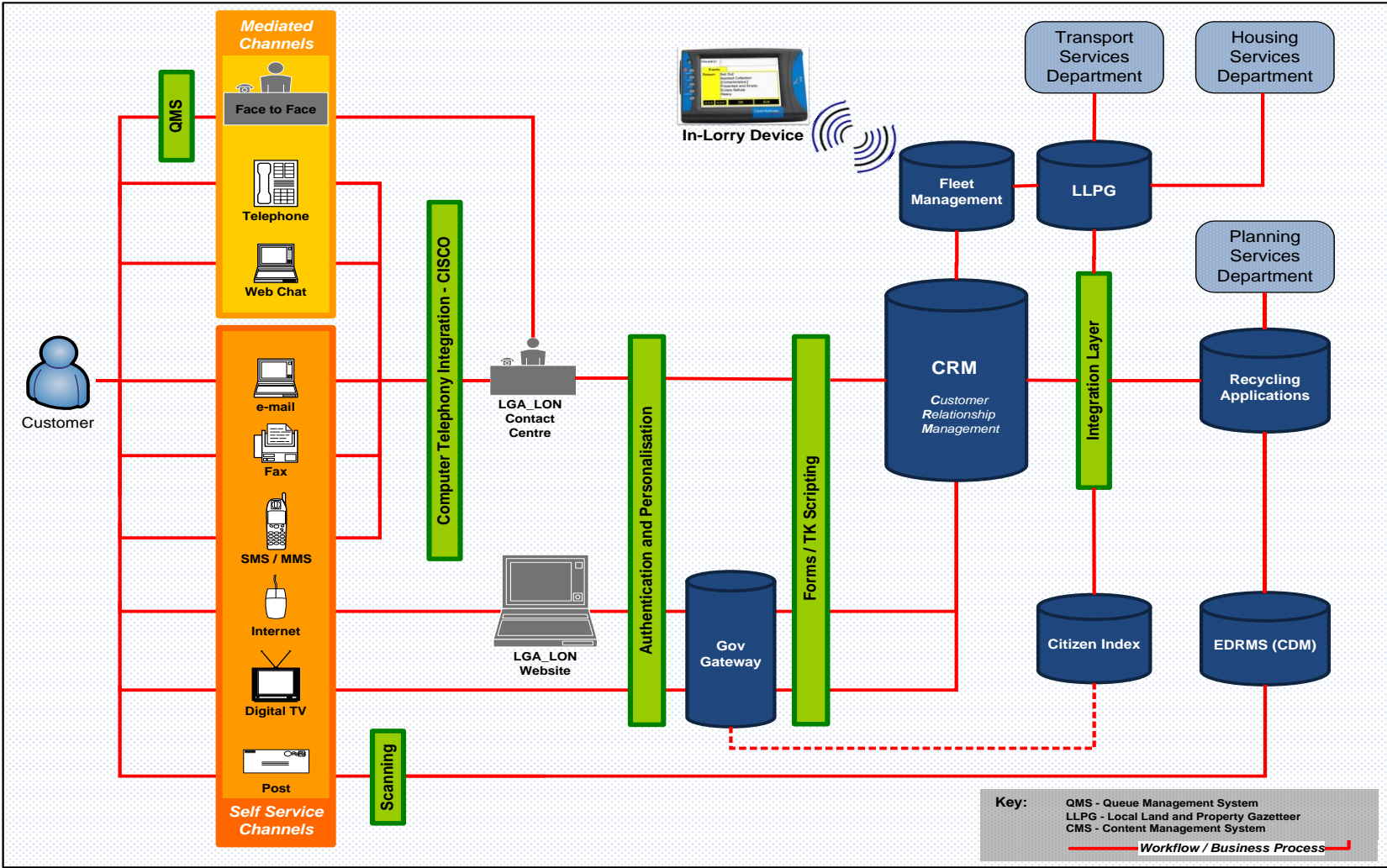


Figure 5-11: Integrated Waste Management (IWM) System in LGA_LON

As it can be observed from this Figure, the three involved departments (i.e., Transport, Housing and Planning Services Department) collaborate on an automated paperless basis where tracking the citizens' data and their enquiry details can be fast, reliable and secured. Residents' enquiries Forms on the authority's webportal are also linked to the CRM system and the waste management system; these are facilitated by the LLPG and EDRMS. The forms allow residents to enquire about missed bins and receive up-to-date information as to why their bin was not collected or if in fact the bin lorry is not quite there yet. In addition, the LLPG is also used for the waste management system's integrated route optimisation module, which is already delivering a 15% reduction in fuel use.

The teams in the authority's contact centre checks the records and allocate collection requests from local residents. Collection addresses are compared with the borough's LLPG in order to accurately identify the location. Once a suitable appointment has been confirmed, the job details are automatically recorded and scheduled in the CRM and forwarded to the collection teams via the Fleet Management System. Moreover, if a resident calls in to report a missed bin, the agent enters the relevant postcode and pulls up a single user-friendly screen with all related information. He/She can see if the street's collection has completed and if there were any contaminated bins (i.e., plastic bags in a garden waste bin) that were uncollectable. Also the admin can view the resident's history with the council, i.e. previous calls, photos of missed bins and letters sent out about recycling. The implementation of the project has, to some extent, resulted in:

- A fully integrated CRM and telephony system for Access LGA_LON, integrated with the back office applications involved in waste management
- Middleware enabling significant and powerful integrations
- An Enterprise Resource Application (SAP) for core business applications
- A new authentication and personalisation system for inspecting data from both SAP and service specific systems
- A high availability network infrastructure
- Replacement of legacy telephone systems with a modern converged IP telephony solution
- A third of all desktop computers renewed
- Introduction of an enterprise wide document and content management system - EDRMS

5.4.5 LGA_LON Case Study Findings 1: Information Sharing Contexts

In this section, the findings of the Integrated Waste Management project in LGA_LON are summarised based on the four main layers of information sharing context, including: Technology Solution, Organisational/Business Process, Inter-organisational Settings and Policy and Social Environment.

- Technology Solution:** The findings of the project reveal that the business transformation partnership has made significant contributions towards improving inter-departmental collaboration and customer service delivery. As the internal partner brought several business analysts, hardware architectures and software developers into LGA_LON, the entire system was designed and developed in-house where most of the features were carefully aligned with business activities and capabilities in the authority. The new Cisco Telephony System and SAP CRM, along with the integration with the four service applications (i.e., EDRMS, Recycling, LLPG and Fleet Management) has made big inroads in capturing, storing and sharing customer details through a single point of contact. The Planning Services Manager indicated that:

“... This is the first time that an LGA has taken paper plans of waste collection routes and digitised them. Managers know at any given moment where all their lorries are – plus the amount of fuel used, time taken, streets completed, rubbish collected and contamination levels ...”

In consultation with the IT department, the strategic partnership sets the strategy for the key corporate applications and the technical strategy associated with the change projects being delivered. However, based on the researcher observations, as a result of the commercial nature of the partnership, together with the operational bias of the IT department, there is a lack of clear corporate IT strategy that covers the development of technology across all levels and improves information sharing in inter-departmental collaboration. The authority developed its taxonomy using the Local Government Classification Scheme (LGCS). The developers found the task of grouping records into classes and building generic metadata to be very difficult. The EDRMS automatically assigns metadata to the records. In this situation, if an employee who has stored a record wants to change the default metadata values, he/she must obtain the consent of the information owner.

The findings of the case also emphasise that the separation of responsibilities for IT across the different departments and the inability of managing the strategic partnership in an effective way has resulted in confusion over (a) the data ownership where no one team has an end to end understanding of the total support environment and (b) who does what between the IT department, BTP and other departments involved in the waste management system. Although the customers submit their queries through a single “Access LGA_LON” webpage, there is misperception on who should be the first point of contact in the back-office.

- **Organisational/Business Process:** Since prior to the development of the project the IT infrastructure was very fragmented with a range of operating platforms and a mixed desktop with around 2000 PCs and 700 client terminals, the implementation of a far more integrated information system was difficult and problematic. The findings of the case study show that the work was extremely challenging in terms of the capacity and dealing with change management. More than 1,500 employees – a third of the entire workforce were affected by the changes. Most of the interviewees argued that the employees still prefer the “old school” way of collaboration in which paper documents were involved and they had full control over the records. The Transport Services Manager declared that:

“... What is very clear is that the integration of the front/back office applications in general and the waste collection services in specific has hugely improved the collaboration among the authority’s department and teams. However, there are still some resistances, which need to be addressed ...”

In this regard, the findings prove two main forms of resistances. First, some of the bin crews, intentionally, try not to use the systems (i.e., GPS, GSM modem and touch-screen messaging terminal) installed on the lorry. The reason is that they feel they are under constant control by the management in which their activities such as conversations in the lorry are recorded. Second, the personnel in the housing services department, in many cases, refuse to share information as they are concerned about data privacy and data protection. The senior officials in the authority attempt to address these challenges through identifying the business need for change and supporting people with regular training.

The researcher could observe that IT in the council is currently very dependent on contract staff, particularly in the IT department where nearly 40% of the current fifty seven posts

fall into this category. Depending on long serving contract staff for service and project delivery represents a high risk. It also raises costs but does mean that the necessary skills are in place for service delivery and gives flexibility when additional skills and resources are required for projects.

LGA_LON, with the support of its internal partner and the IT department, has implemented workflow software for Business Process Management (BPM) and web content management software as the EDRMS solution. These two have enabled the authority to make significant business improvements through an end to end business processes re-engineering (BPR). The officials expect that the on-going BPR will make a significant contribution towards improving network collaboration and bringing corporate savings. However, the DSM believed that the reorganisation of the business processes has resulted in some key functions becoming missing from the structure. He stated:

“... The IT client role, which includes security, business engagement, supplier management, performance management and strategy, has had little focus and resource applied to it. These are essential functions in a modern IT organisation ...”

- **Inter-organisational Settings:** The discussions with the senior managers in LGA_LON reveal that the importance of improving inter-departmental collaboration, information sharing in an electronic style and the demands associated with the Freedom of Information and Data Protections Acts have been recognised as significant issues in the organisation. The Housing Services Manager stated that:

“... Although there are pockets of good practices in the authority, there is no corporate strategy that supports the management of the council’s information resources and how information should be stored, shared, kept secure, classified or disposed of. I do believe that the integration between the front-line and back-office applications will extensively move these initiatives forward, but there is still much work to be done ...”

The senior officials in LGA_LON are considering the integrated system as a key enabler of collaboration, compliance and a contributor to effective problem solving and decision-making. The findings report that LGA_LON struggled with managing the transition from

the old organisational structure where each department had its own information systems and business and decision-making processes to the new arrangement where service delivery was shared across the organisation through several integrated systems. Not only had many of the employees received new positions and roles, but they were moved to new open-space locations. They did not know the people that they had to deal with, or who to ask about practical issues. Therefore, the efficiency and productivity diminished during the first 5 months of the implementation until the senior management started to host several team-building events and tried to be more visible and performing a supportive rather than controlling role. Regarding the changes occurred by the integrated systems, the PSM stated that:

“... The technological changes were difficult to adopt, but the cultural changes were almost impossible! ... The working culture of those departments involved in the integrated system should change. This change should go hand to hand with a wider shift in cultural values where personal information is viewed as an asset to be treated with respect ...”

The senior management recognised that the level of collaboration and the usability of the integrated systems rely on the level of IT knowledge among the employees. In this regard, the authority set the following key actions to be followed:

- Developing an IT training strategy, jointly with HR, for all staff across the organisation.
- Assess the IT competency level of staff across the Council.
- Identify cost-effective training methods for high volumes of staff including computer-based learning, possible collaborative working with local colleges and adoption of cascade training through the use of super-users.
- Explore opportunities for the transfer of skills through the strategic partnership.
- Develop an IT training strategy specifically for IT staff for inclusion in the Finance Directorate Workforce Strategy.

The discussions with the interviewees illustrate that LGA_LON is moving towards the fact that decision-making in one department may need the information and evidence held in another. Also, they attempt to emphasise the implications and benefits of a joined-up and collaborative approach to service delivery that will inevitably highlight the importance of information sharing, either because of mutual interest or through recognition of

duplication in support services.

- **Policy and Social Environment:** Similarly to the previous case studies, this category focuses on external influences on the decision of the local authority regarding EIS. Although the Central Government's penalty over the data breaches pushed the authority towards improving its service delivery processes, the discussions with the interviewees reveal that LGA_LON were not strongly influenced by political pressures during developing and implementing the integrated systems. The Head of IT Services Department formed a team of two information sharing officers and two corporate and administrative lawyers to review and inspect the alignment of the projects with the Central Government guidance, the Data Protection and Human Rights Acts.

On the other hand, the findings of the case show that the economic and ecological issues have played a major role and influenced the authority's decision on establishing inter-departmental collaboration through integrated systems. The authority managed to successfully estimate the amount of savings in terms of recycling and fuel consumption. Based on a fact sheet provided by the LGA_LON's Business Transformation Unit, the IWM system will reduce the amount of waste sent to landfill by 18.8%, saving the council about £ 2,860,000 over ten years. The system will also give a 15% reduction in fuel (£11,000 in year one) by creating the most efficient collection rounds possible. In addition to the financial savings, the waste management system will have huge environmental impacts as it will reduce the number of contaminated bins and CO2 emissions and the council's carbon footprint. The PSM stated that:

"... We have managed to analyse the data gathered through the integrated system to highlight the areas that were not complying; intensive door to door knocking was undertaken in the worst areas in order to educate people in the correct procedures and collection days. This further reduced the number of calls coming into the call centre as it proactively targeted the source of regular issues ..."

5.4.6 LGA_LON Case Study Findings 2: Testing Research Propositions

In this section, in order to validate the proposed conceptual framework (Figure 3.6), the findings of the IWM project will be presented based on the four research propositions.

Testing Research Proposition A: Factors Influencing EIS in LGAs

The Data Services Manager (DSM), Transport Services Manager (TSM), Housing Services Manager (HSM) and Planning Services Manager (PSM) were asked to comment on the importance of the proposed factors influencing EIS regarding the Front/Back Office Integration – Integrated Waste Management (IWM) System. The results are summarised in Table 4-31.

		Factors	DSM	TSM	HSM	PSM
EE		Political Pressure (PP)	⊙	○	○	○
		Economic Pressure (EP)	⊙	○	⊙	⊙
		Legislation and Policy Principles (L&P)	⊙	⊙	⊙	⊙
		Community Pressure (CP)	●	●	●	●
CO		Inter-Organisational Leadership (IOL)	⊙	⊙	●	●
		Return on Investment (ROI)	●	●	●	●
		Network Collaboration Culture (CC)	●	⊙	●	●
		Organisation size (OS)	⊙	⊙	⊙	○
TE		IT Capability (ITC)	●	●	●	⊙
		Data Security and Privacy (DS&P)	○	●	⊙	○
		Information Quality (IQ)	●	⊙	●	●
		Interoperability Framework (IF)	⊙	○	⊙	○
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 5-31: Validation of the Factors Influencing EIS in LGA_LON

This table illustrates a mix result compared to the previous cases. The main discussion in the External Environment group was the Community Pressure. All of the interviewees, in spite of the two previous cases, highlighted that citizen satisfaction was among the most important factors influencing their decision about EIS. The DSM argued that:

“... The customer satisfaction [before implementing the integrated system] was very low. Some of the reasons were that the slow response from the Service Desk as a result of poor communication around service levels and responsibilities and confusion over who does what ...”

Most of the customers’ feedbacks regarding bin collection or missed bins were negative. Figure 5-12 illustrates the customer journey prior to implementing the IWM system.

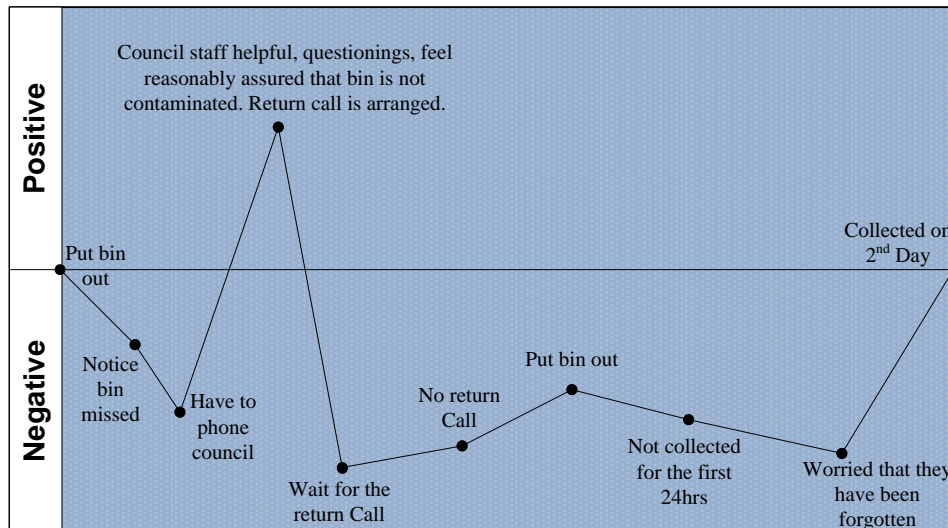


Figure 5-12: Customer Journey Map Prior to Implementing IWM System in LGA_LON

The officials realised that the customer experience would be much improved if they could provide more information at the first point of contact the customer has with the Council. Therefore, providing information that fed by the SAP CRM would remove the steps in the process that caused the greatest levels of dissatisfaction for the customer. As it is illustrated in Figure 5-12, after the implementation of the IWM System, citizens’ feedbacks drastically improved. The customers become more satisfied as they were explained about the stages of bin collection, types and reasons of contamination.

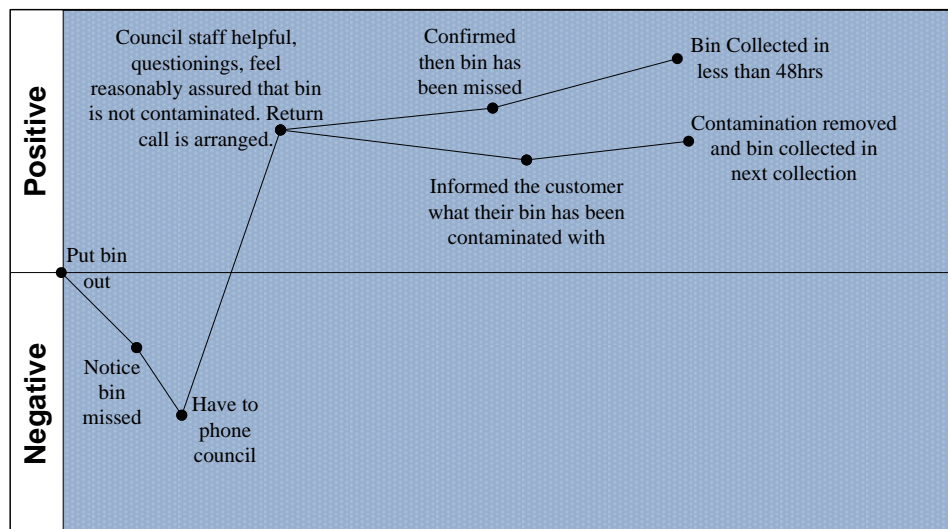


Figure 5-13: Customer Journey Map After Implementation of IWM System

Yet again, in contrast with the two previous case studies, the interviewees did not find political pressure as an influential factor for EIS in LGA_LON. Moreover, the interviewees

argued that the level of IT competency and allocated budget was not quite similar across the authority's department. Hence, Critical Mass was not influential on their decision about EIS. Therefore, as most of the factors received moderate and high importance by the interviewees, it can be asserted that the proposed EIS factors are validated through this case study.

Testing Research Proposition B: EIS Participation Phases

The four interviewees were asked to comment on and highlight the importance of the participation phases based on the IWM System. As it can be observed from Table 4-32, LGA_LON went through all of the phases while developing and implementing the Front/Back office integration project. The Housing Services Manager (HSM) stated:

"...We knew that using a variety of platforms and the lack of control over unstructured data in different departments are the major barriers to share information electronically. Therefore, we had to develop a business case based on the problems and needs in the front and back office processes, which reflects the first two phases of EIS. After several meetings between the managers of the department involved in this initiative [Waste Management] and our strategic partner, the proposal on the best solution was finalised and the decision was taken by the LGA_LON's IT Board ..."

Participation Phases	DSM	TSM	HSM	PSM
Incentive	●	●	●	●
Conception	●	●	●	●
Proposal	●	⊙	●	⊙
Participation Decision	⊙	⊙	●	●
Sustainability	●	●	●	●

Table 5-32: The Importance of the Participation Phases in IWM Project

The findings show that the authority spent a reasonable amount of time in the first two phases (i.e., Incentive and Conception). However, although the interviewees indicated the Sustainability phase as an important phase, the authority did not have any actual plan to sustain the effort of inter-departmental EIS.

The DSM – as one of the primary members of the project team added two more phases to the initial phases. He stated:

"... although it was the first time that the authority was implementing an inter-organisational information system in this scale, I asked my staff to do a

comprehensive research on previous IT projects and analyse the successes and failures ... After identifying the business problems and before deciding about the best solution, we went through Legislative Framework Phase to understand and classify the circumstances where we can share information with other departments ...”

Therefore, based on these findings, it appears that the proposed participation phases are tested.

Testing Research Proposition C: Mapping EIS Participation Factors on the Lifecycle

Similar to the previous case studies, the interviewees were asked to map the factors influencing EIS on different phases of the participation. Table 4-33 summarises the results based on the IWM System in LGA_LON. Those factors that were recognised by less than three interviewees will not be considered for further analysis (i.e., prioritisation).

		<i>Incentive</i>					<i>Conception</i>					<i>Proposal</i>					<i>Participation Decision</i>					<i>Sustainability</i>				
		DSM	TSM	HSM	PSM	Results	DSM	TSM	HSM	PSM	Results	DSM	TSM	HSM	PSM	Results	DSM	TSM	HSM	PSM	Results	DSM	TSM	HSM	PSM	Results
Factors																										
EE	Political Pressure	-	-	✓	-	1/4	-	-	-	✓	1/4	✓	-	-	✓	2/4	-	✓	✓	-	2/4	-	-	✓	✓	2/4
	Economic Pressure	✓	-	✓	✓	3/4	✓	-	✓	✓	3/4	✓	-	✓	✓	3/4	✓	-	-	✓	2/4	-	✓	-	-	1/4
	Legislation and Policy	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	-	✓	-	✓	2/4	✓	-	✓	✓	3/4
	Community Pressure	-	✓	✓	✓	3/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	✓	-	-	-	1/4	✓	✓	✓	✓	4/4
CO	Inter-Org. Leadership	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	✓	✓	-	3/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	4/4
	Return on Investment	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4
	Network Coll. Culture	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	-	✓	3/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4
	Organisation size	✓	✓	✓	-	3/4	✓	✓	✓	-	3/4	✓	-	✓	-	2/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	4/4
TE	IT Compatibility	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	✓	✓	-	3/4	✓	✓	-	✓	3/4	-	-	-	-	0/4
	Data Security & Privacy	✓	-	✓	✓	3/4	✓	-	✓	✓	3/4	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	✓	✓	✓	4/4
	Information Quality	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4
	Inter. Framework	✓	-	✓	✓	3/4	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	-	-	✓	2/4	✓	✓	✓	-	3/4
EIS	Cost of EIS	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4
	Benefit of EIS	✓	-	✓	✓	3/4	✓	✓	-	✓	3/4	✓	-	✓	✓	3/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	4/4
	Risk of EIS	✓	✓	✓	✓	4/4	-	✓	✓	✓	3/4	✓	-	-	✓	2/4	✓	✓	✓	✓	4/4	✓	✓	-	✓	3/4
IDE	Business Process Com.	✓	✓	✓	✓	4/4	✓	✓	✓	-	3/4	✓	-	✓	✓	3/4	✓	✓	✓	✓	4/4	✓	-	✓	✓	3/4
	Inter-departmental Trust	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	✓	✓	4/4	✓	✓	-	✓	3/4	✓	✓	✓	✓	4/4
	Critical Mass	✓	✓	✓	-	3/4	-	✓	-	✓	2/4	✓	-	✓	✓	3/4	✓	✓	-	✓	3/4	-	-	-	✓	1/4

Table 5-33: Mapping of the EIS Factors to the Participation Phases for the IWM Project

Testing Research Proposition D: Prioritisation of EIS Participation Factors on the Participation Phases

For this section, a similar pattern to the previous case studies was carried out in order to prioritise each the proposed factors on the participation phases. The prioritisation follows similar procedures to the ones applied in the previous case study, including: decomposition, comparative judgments, determining normalised priority weights and analysing and calculating the priority weights. Tables 5.34 – 5.38 show the ranking of each factor in their respective group in relation to the five participation phases.

		Incentive Phase				
		Factors	DSM	TSM	HSM	PSM
EE		Economic Pressure	(1)0.4778	(2)0.3202	(1)0.4670	(2)0.3042
		Legislation and Policy	(2)0.3500	(3)0.1226	(3)0.1566	(3)0.1721
		Community Pressure	(3)0.1722	(1)0.5571	(2)0.3763	(1)0.5237
CO		Inter-Org. Leadership	(3)0.1560	(2)0.2341	(2)0.2808	(2)0.2212
		Return on Investment	(1)0.4609	(1)0.5702	(1)0.5479	(1)0.5753
		Network Coll. Culture	(2)0.3104	(4)0.0740	(3)0.1149	(3)0.1456
		Organisation size	(4)0.0726	(3)0.1215	(4)0.0850	(4)0.0576
TE		IT Capabilities	(1)0.4667	(1)0.5340	(1)0.4678	(1)0.4835
		Data Security & Privacy	(3)0.1392	(3)0.1081	(4)0.0991	(3)0.1095
		Information Quality	(4)0.0795	(4)0.0754	(3)0.1239	(3)0.1095
		Interoperability Framework	(2)0.3145	(2)0.2822	(2)0.3649	(2)0.2973
EIS		Cost of EIS	(1)0.6196	(1)0.6551	(2)0.5571	(1)0.5571
		Benefit of EIS	(2)0.2243	(2)0.2114	(3)0.1226	(3)0.1226
		Risk of EIS	(3)0.1560	(3)0.1334	(1)0.9607	(2)0.3202
IDE		Business Process Com.	(1)0.7070	(1)0.7093	(1)0.6502	(1)0.5962
		Inter-departmental Trust	(2)0.2014	(2)0.2141	(2)0.2543	(2)0.3191
		Critical Mass	(3)0.0915	(3)0.0765	(3)0.0951	(3)0.0846

Table 5-34: Priority Weights of the Factor on the Incentive Phase

Conception Phase					
Factors		DSM	TSM	HSM	PSM
EE	Economic Pressure	(3) 0.1716	(2) 0.2857	(2) 0.2857	(2) 0.2000
	Legislation and Policy	(2) 0.2768	(1) 0.5714	(1) 0.5714	(1) 0.4000
	Community Pressure	(1) 0.5516	(3) 0.1428	(3) 0.1428	(1) 0.4000
CO	Inter-Org. Leadership	(2) 0.2258	(2) 0.2340	(1) 0.3718	(3) 0.1685
	Return on Investment	(1) 0.5368	(1) 0.5052	(1) 0.3718	(1) 0.5049
	Network Coll. Culture	(3) 0.1760	(3) 0.1873	(2) 0.1979	(2) 0.2747
	Organisation size	(4) 0.0613	(4) 0.0732	(3) 0.0583	(4) 0.0515
TE	IT Capabilities	(1) 0.3743	(1) 0.4629	(1) 0.5116	(1) 0.5749
	Data Security & Privacy	(4) 0.1766	(2) 0.2724	(2) 0.2378	(2) 0.2026
	Information Quality	(2) 0.2413	(3) 0.1686	(3) 0.1724	(3) 0.1471
	Interoperability Framework	(3) 0.2076	(4) 0.0958	(4) 0.0779	(4) 0.0652
EIS	Cost of EIS	(1) 0.5571	(1) 0.4285	(1) 0.5321	(1) 0.5559
	Benefit of EIS	(3) 0.1226	(2) 0.1428	(3) 0.1017	(3) 0.0903
	Risk of EIS	(2) 0.3202	(1) 0.4285	(2) 0.3666	(2) 0.3537
IDE	Business Process Com.	(1) 0.7500	(2) 0.1666	(1) 0.7500	(2) 0.2500
	Inter-departmental Trust	(2) 0.2500	(1) 0.8333	(2) 0.2500	(1) 0.7500

Table 5-35: Priority Weights of the Factor on the Conception Phase

Proposal Phase					
Factors		DSM	TSM	HSM	PSM
EE	Economic Pressure	(3) 0.1592	(2) 0.2857	(2) 0.2604	(2) 0.2298
	Legislation and Policy	(1) 0.5889	(1) 0.5714	(1) 0.6333	(1) 0.6479
	Community Pressure	(2) 0.2518	(3) 0.1428	(3) 0.1061	(3) 0.1222
CO	Inter-Org. Leadership	(1) 0.6193	(2) 0.2734	(2) 0.2213	(2) 0.2923
	Return on Investment	(3) 0.0964	(3) 0.0869	(3) 0.0933	(3) 0.0806
	Network Coll. Culture	(2) 0.2841	(1) 0.6393	(1) 0.6852	(1) 0.6269
TE	IT Capabilities	(3) 0.1408	(3) 0.1480	(3) 0.1394	(3) 0.1127
	Data Security & Privacy	(1) 0.5200	(2) 0.2880	(1) 0.4971	(1) 0.4877
	Information Quality	(2) 0.2681	(1) 0.4955	(2) 0.2964	(2) 0.3322
	Interoperability Framework	(4) 0.0708	(4) 0.0683	(4) 0.0670	(4) 0.0672
EIS	Cost of EIS	(1) 0.5000	(1) 0.6666	(1) 0.6666	(1) 0.7500
	Benefit of EIS	(1) 0.5000	(2) 0.3333	(2) 0.3333	(2) 0.2500
IDE	Business Process Com.	(2) 0.2344	(2) 0.3237	(2) 0.2435	(2) 0.2828
	Inter-departmental Trust	(1) 0.6877	(1) 0.5869	(1) 0.6710	(1) 0.6433
	Critical Mass	(3) 0.0778	(3) 0.0892	(3) 0.0854	(3) 0.0737

Table 5-36: Priority Weights of the Factor on the Proposal Phase

		Participation Phase				
		Factors	DSM	TSM	HSM	PSM
CO		Inter-Org. Leadership	(1) 0.4004	(2) 0.3198	(1) 0.5449	(1) 0.4650
		Return on Investment	(2) 0.1313	(3) 0.1556	(3) 0.1477	(3) 0.1271
		Network Coll. Culture	(1) 0.4004	(1) 0.4819	(2) 0.2629	(2) 0.3444
		Organisation size	(3) 0.0675	(4) 0.0549	(4) 0.0444	(4) 0.0634
TE		IT Capabilities	(2) 0.2000	(3) 0.1513	(1) 0.3333	(3) 0.1372
		Data Security & Privacy	(1) 0.4000	(1) 0.4719	(1) 0.3333	(2) 0.2395
		Information Quality	(1) 0.4000	(2) 0.3767	(1) 0.3333	(1) 0.6232
EIS		Cost of EIS	(1) 0.5119	(1) 0.6069	(1) 0.3333	(2) 0.2298
		Benefit of EIS	(2) 0.3601	(3) 0.0896	(1) 0.3333	(3) 0.1222
		Risk of EIS	(3) 0.1279	(2) 0.3033	(1) 0.3333	(1) 0.6479
IDE		Business Process Com.	(3) 0.1167	(2) 0.1676	(2) 0.2923	(1) 0.4444
		Inter-departmental Trust	(1) 0.6597	(1) 0.7379	(1) 0.6269	(1) 0.4444
		Critical Mass	(2) 0.2236	(3) 0.0944	(3) 0.0806	(2) 0.1111

Table 5-37: Priority Weights of the Factor on the Participation Phase

		Sustainability Phase				
		Factors	DSM	TSS	HSM	PSM
EE		Legislation and Policy	(2) 0.1666	(2) 0.3333	(2) 0.1666	(2) 0.3333
		Community Pressure	(1) 0.8333	(1) 0.6666	(1) 0.8333	(1) 0.6666
CO		Inter-Org. Leadership	(3) 0.1399	(2) 0.2426	(2) 0.1709	(2) 0.3457
		Return on Investment	(4) 0.0592	(4) 0.0854	(3) 0.1281	(4) 0.0721
		Network Coll. Culture	(1) 0.5197	(1) 0.5603	(1) 0.6342	(1) 0.5073
		Organisation size	(2) 0.2811	(3) 0.1118	(4) 0.0665	(3) 0.0746
TE		Data Security & Privacy	(3) 0.1167	(3) 0.1415	(2) 0.3091	(3) 0.1458
		Information Quality	(2) 0.2236	(1) 0.5246	(1) 0.5812	(1) 0.4583
		Interoperability Framework	(1) 0.6597	(2) 0.3337	(3) 0.1096	(2) 0.3958
EIS		Cost of EIS	(3) 0.2106	(2) 0.2000	(1) 0.3333	(2) 0.3119
		Benefit of EIS	(1) 0.5485	(1) 0.6000	(1) 0.3333	(3) 0.1976
		Risk of EIS	(2) 0.2409	(2) 0.2000	(1) 0.3333	(1) 0.4905
IDE		Business Process Com.	(2) 0.2500	(2) 0.2000	(2) 0.2000	(2) 0.2000
		Inter-departmental Trust	(1) 0.7500	(1) 0.8000	(1) 0.8000	(1) 0.8000

Table 5-38: Priority Weights of the Factor on the Sustainability Phase

Tables 5.39 – 5.43 illustrate the global weights of the factors for each phase of EIS. They have been calculated by aggregating the values of each factor and dividing the results by the number of interviewees.

<i>Incentive Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Business Process Compatibility	0.7639
2	EIS Characteristic	Cost of EIS	0.5972
3	Capacity of Organisation	Return on Investment	0.5386
4	Technology Environment	IT Capabilities	0.4880
5	Inter-departmental Env.	Inter-departmental Trust	0.4382
6	External Environment	Community Pressure	0.4073
7	EIS Characteristic	Risk of EIS	0.3926
8	External Environment	Economic Pressure	0.3923
9	EIS Characteristic	Benefits of EIS	0.3195
10	Technology Environment	Interoperability Framework	0.3147
11	Technology Environment	Data Security and Privacy	0.2360
12	Capacity of Organisation	Inter-organisational Leadership	0.2230
13	External Environment	Legislation and Policy Principles	0.2003
14	Capacity of Organisation	Network Collaboration Culture	0.1612
15	Technology Environment	Information Quality	0.1552
16	Capacity of Organisation	Organisation size	0.1245
17	Inter-departmental Env.	Critical Mass	0.0794

Table 5-39: Ranking of the Factors in the Incentive Phase

<i>Conception Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Inter-departmental Trust	0.5208
2	EIS Characteristic	Cost of EIS	0.5184
3	Technology Environment	IT Capabilities	0.4809
4	Capacity of Organisation	Return on Investment	0.4797
5	Inter-departmental Env.	Business Process Compatibility	0.4791
6	External Environment	Legislation and Policy Principles	0.4549
7	EIS Characteristic	Risk of EIS	0.3672
8	External Environment	Community Pressure	0.3093
9	Capacity of Organisation	Inter-organisational Leadership	0.2500
10	EIS Characteristic	Benefits of EIS	0.2439
11	Technology Environment	Information Quality	0.2379
12	External Environment	Economic Pressure	0.2357
13	Technology Environment	Data Security and Privacy	0.2223
14	Capacity of Organisation	Network Collaboration Culture	0.2089
15	Technology Environment	Interoperability Framework	0.1117
16	Capacity of Organisation	Organisation size	0.0610

Table 5-40: Ranking of the Factors in the Conception Phase

<i>Proposal Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	EIS Characteristic	Cost of EIS	0.6458
2	Inter-departmental Env.	Inter-departmental Trust	0.6472
3	External Environment	Legislation and Policy Principles	0.6103
4	Technology Environment	Data Security and Privacy	0.4482
5	Capacity of Organisation	Network Collaboration Culture	0.4143
6	EIS Characteristic	Benefits of EIS	0.3541
7	Capacity of Organisation	Inter-organisational Leadership	0.3516
8	Technology Environment	Information Quality	0.3480
9	Inter-departmental Env.	Business Process Compatibility	0.2711
10	External Environment	Economic Pressure	0.2338
11	External Environment	Community Pressure	0.1557
12	IT Capabilities	IT Capabilities	0.1352
13	Capacity of Organisation	Return on Investment	0.0893
14	Inter-departmental Env.	Critical Mass	0.0815
15	Technology Environment	Interoperability Framework	0.0683

Table 5-41: Ranking of the Factors in the Proposal Phase

<i>Participation Phase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Inter-departmental Trust	0.6172
2	Technology Environment	Information Quality	0.4333
3	Capacity of Organisation	Inter-organisational Leadership	0.4325
4	EIS Characteristic	Cost of EIS	0.4204
5	Capacity of Organisation	Network Collaboration Culture	0.3724
6	Technology Environment	Data Security and Privacy	0.3611
7	EIS Characteristic	Risk of EIS	0.3531
8	Inter-departmental Env.	Business Process Compatibility	0.2552
9	EIS Characteristic	Benefits of EIS	0.2263
10	IT Capabilities	IT Capabilities	0.2054
11	Capacity of Organisation	Return on Investment	0.1404
12	Inter-departmental Env.	Critical Mass	0.1274
13	Capacity of Organisation	Organisation size	0.0575

Table 5-42: Ranking of the Factors in the Participation Phase

<i>SustainabilityPhase</i>			
Rank	Factor Group	Factor	Global Weight
1	Inter-departmental Env.	Inter-departmental Trust	0.7875
2	External Environment	Community Pressure	0.7500
3	Capacity of Organisation	Network Collaboration Culture	0.5553
4	Technology Environment	Information Quality	0.4469
5	EIS Characteristic	Benefits of EIS	0.4198
6	Interoperability Framework	Interoperability Framework	0.3747
7	EIS Characteristic	Risk of EIS	0.3162
8	Inter-departmental Env.	Business Process Compatibility	0.2915
9	EIS Characteristic	Cost of EIS	0.2639
10	External Environment	Legislation and Policy Principles	0.2500
11	Capacity of Organisation	Inter-organisational Leadership	0.2248
12	Technology Environment	Data Security and Privacy	0.1783
13	Capacity of Organisation	Organisation size	0.1335
14	Capacity of Organisation	Return on Investment	0.0862

Table 5-43: Ranking of the Factors in the Sustainability Phase

The prioritisation results will be analysed in Chapter 6. Regarding the IWM case, in contrast with the two previous case studies, Risk of EIS was not among the high ranked factors. Instead, Benefit and Cost of EIS received high rankings in the prioritisation process. Similarly to the previous cases, Interdepartmental Trust and Network Collaboration Culture were among the highly ranked ones in most of the phases. Political Pressure, Economic Pressure, Organisation size and Critical Mass were either not mapped in the previous phase (i.e., Testing Research Proposition C) or received a very low rank. Other factors and the participation lifecycle phases are tested and validated through the LGA_LON's IWM project in which they have either directly or indirectly influenced the decision-making process for EIS. This supports the literature findings and validates the EIS conceptual framework presented in Chapter 3.

5.5 Summarising the Findings

This Chapter presented case studies concerning the effort of EIS in three LGAs within the region of England and Wales. All selected authorities had to develop, implement and adopt inter-organisational systems to improve the collaboration among their departments and to ensure that the effort of information sharing is flawless, secure and continual. The empirical data were collected through several sources including interviews, observations, official reports and technical factsheets.

The main objectives of conducting the case studies were to (a) examine the state of EIS in the LGA departments (e.g., whether the LGAs shared information electronically and if so, how they carried out this effort) and (b) identify the barriers and enablers of personal information sharing in the inter-departmental collaboration. Therefore, the findings of the cases were discussed in two parts. In the first part, the findings were categorised based on the information sharing context discussed in Section 2.6 (i.e., technology solution, organisational/business process, inter-organisational settings and policy and environment). In the second part, the research propositions identified in Section 3.5 were evaluated.

Based on the findings, it is clear that the factors and participation phases proposed in the conceptual model influenced the decision-making processes toward EIS. However, the full assessment of how each factor has influenced the process, why some of the factors received less priority by the interviewees and the extent to which the final decision on EIS altered the capacity of organisation in terms of adopting IOS will be discussed in Chapter 6. The main conclusions drawn from investigating EIS in UK's LGAs are summarised below:

- **Finding 1:** The empirical findings from the case organisations clearly show that transforming inter-departmental collaboration and improving information management are acknowledged as two key strategic approaches to the budget deficit in the LGAs. The officials, however, realised that the IT infrastructure, information resources and organisational backbone are hardly ready for the challenge. Therefore, during the last 10 years, the LGAs and their partners have invested billions of pounds in IT projects that facilitate inter-departmental collaboration in order to improve service delivery and enhance public protection. It can be understood that so much of the focus has been on information technology rather than information itself. In many cases, even though the computerised information systems are in place, the information required for decision-making in LGAs is not quite complete, accurate, or timely and those who have to make the decisions are struggling to draw the appropriate conclusion from whatever is available.
- **Finding 2:** The findings of the case organisations show that, as a result of the organisational structure in the LGAs, bringing together a large number of departments with different professional cultures, assessment methods, priorities, business needs, computer systems and different positions on information sharing is understandably a complex and time consuming task. It appears that corporate functions and decision-

making processes are carried out solely in each department and they act as if they are not part of a larger organisation. This finding supports the argument that, in order to study the adoption of IOS in LGAs, the inter-departmental environment has to be examined separately to the organisational environment.

- **Finding 3:** Based on information extracted from the selected authorities, it appears that there is a lack of responsibility and accountability for handling personal information. Even after implementing the IOSs that handle the entire process of information sharing, the authorities suffer from what may call “data ownership”. The findings suggest that, in some cases, good intentions are undermined by a lack of visible senior officials or accountability structures. This has influenced the confidence of the junior staff in making decisions about sharing personal information. As EIS effort is categorised as a high-risk initiative, it should be supported by top/senior management in the organisation.
- **Finding 4:** Prior to the adoption and implementation of the IOSs in the LGAs, the employees involved in the effort of information sharing had not reached the point that “not sharing” information may be more dangerous than sharing information. The findings of the case studies suggest that this concern is gradually changing; from how personal information is collected to how it is used and shared. Moreover, the findings suggest that the LGA departments have realised the fact that sharing information carries both benefits and risks. However, the culture of indecision that surrounds information sharing is problematic and has limited the collaboration among the departments. One of the reasons can be attributed to the low level of training. The departments within the LGAs seem to have focused on a process of “unconscious learning” for employees to become skilled in information management. This means that the employees are learning how to share information via the IOSs as they are working with the systems. For those who deal with sensitive information, lack of knowledge regarding the systems in the first place, has led to a pile of fear, a great reluctance to share and repeated failures to protect citizens’ privacy.
- **Finding 5:** Empirical evidence from the case studies indicate that when personal information is to be shared, there is no clarity as to what the current laws permit or prohibit. One of the major problems is that although the Data Protection Act and Human Rights Act provide a fairly sensible approach to sharing personal information, they cannot

provide a sufficient practical framework for making decisions about whether and how personal information should or should not be shared electronically (i.e., via IOSs). The departments involved in EIS initiatives rely on pile of guidelines from different sources, many of which are outdated and in contrast with other guidance.

- **Finding 6:** Based on the findings of the case studies, it is worth mentioning that while testing research proposition A, some of the factors (e.g., benefits of EIS and business process compatibility) were not recognised as highly important. However, the attitudes towards most of them changed throughout testing research proposition C, where the EIS effort was broken down into five phases and the interviewees were asked to map the factors influencing EIS on to different phases of participation. This supports the argument that the identified factors influencing EIS should be tackled within the stages of participation, so decision-making on how to solve those issues become easier for the organisation.
- **Finding 7:** Regarding the external environment category, the findings suggest that the economic situation hasn't had similar effects on the selected LGAs. LGA_SE was the only authority able to cope with the economic pressure from the Central Government. The other two authorities suffered from the budget cuts and shortage of funding. Soon after the budget cuts announced by the Chancellor of the Exchequer, the officials in LGA_SE realised that through integration of their IT infrastructure and corporate applications, they can improve the level of inter-departmental collaboration that would lead to a decrease in the cost of service delivery. Political pressures also had different influences on the authorities. LGA_LON's official realised this pressure as an opportunity and through several noble proposals managed to secure more than £1.5m grant by the Central Government. On the other hand, the other two authorities (LGA_NW and LGA_SE) felt the pressure as an "obligation without consideration" in which they should focus on other priorities rather than implementing and adopting IOSs.
- **Finding 8:** Regarding the capability of organisation factor group, the findings indicate that the culture that influences how personal information is viewed, handled and shared must transform. It is clear that, even after implementation of the integrated systems, in none of the authorities a strong culture of accountability and scrutiny is in place to ensure that the citizens' information is treated with care. On a different note, none of the interviewees

recognise the size of the authority has influenced their decision on adopting the integrated systems hence EIS. In turn, they indicated “size of the collaboration network” as an influential factor in which the more departments involved in any EIS effort, the more complex and risky it becomes.

- **Finding 9:** Concerning the technology environment, the findings suggest that there is no corporate strategy on standardisation of the business processes and legacy systems. As a result, the authorities were not able to interoperate the independent and heterogeneous information systems in different departments. The application architecture in the authorities was developed from scratch; hence the technological and organisational transformations were enormously costly.
- **Finding 10:** With regards to the inter-departmental environment, the findings indicate that the departments do not follow the pathway that other departments have gone through. This is in contrast with previous research, which has shown that agencies in the public sector are directly affected by the actions of other public agencies in IT innovation. It can be argued that, in the authorities selected for this study, the decision on participation in inter-departmental EIS relies more on what the network of collaboration is doing rather than on what the characteristics of EIS are. However, as a result of the imbalance of resources (organisational and technological) in the LGA departments, the decision of some departments on sharing information has a very limited influence on the decision of other departments that have not started to be involved in such initiative.

Chapter 6 – Discussion on the EIS Framework

6.1 Discussion

As explained earlier, the main aim of this thesis is to identify and analyse the enablers and barriers that influence the decision of LGA departments in taking part in electronic information sharing in inter-departmental collaboration. To achieve this objective, three case studies were conducted in the region of England and Wales. The case organisations focused on the projects in which inter-departmental collaborations were required to facilitate personal information sharing, hence the delivery of public services. The results and findings of the case studies presented in Chapter 5, generally, support and validate the four suggested research propositions.

It is not the intention of this research to offer practical guidelines for IOS adoption and EIS decision-making in LGAs, but rather to describe the perspectives and experiences of those who are actually involved in such efforts. Hence, the research present in this thesis attempts to provide a broader understanding of the EIS effort in three main types of local authorities; a Unitary Council (i.e. LGA_NW), a County Council (i.e. LGA_SE) and a London Borough (i.e. LGA_LON). Table 6-1 provides a summary of the findings from each of the cases. In the following sections, the findings regarding each of the proposed factors and participation phases will be discussed in a greater detail.

Research Propositions (RP)		LGA_NW		LGA_SE		LGA_LON	
		Tested	Supported	Tested	Supported	Tested	Supported
RP-A: Factors Influencing EIS in LGAs	Political Pressure	✓	●	✓	●	✓	○
	Economic Pressure	✓	●	✓	⊙	✓	⊙
	Legislation and Policy	✓	●	✓	●	✓	⊙
	Community Pressure	✓	●	✓	●	✓	●
	Inter-Org. Leadership	✓	⊙	✓	●	✓	●
	Return on Investment	✓	●	✓	⊙	✓	●
	Collaboration Culture	✓	●	✓	●	✓	●
	Organisational Size	✓	○	✓	×	✓	⊙
	IT Compatibility	✓	●	✓	●	✓	●
	Data Security & Privacy	✓	●	✓	●	✓	⊙
	Information Quality	✓	●	✓	●	✓	●
	Tech. Interoperability	✓	●	✓	⊙	✓	○
	Cost of EIS	✓	●	✓	●	✓	●
	Benefit of EIS	✓	⊙	✓	⊙	✓	●
	Risk of EIS	✓	●	✓	●	✓	⊙
	Business Process Com.	✓	●	✓	●	✓	●
	Inter-departmental Trust	✓	●	✓	●	✓	●
Critical Mass	✓	○	✓	○	✓	○	
RP-B: Participation Phases	Incentive	✓	●	✓	●	✓	●
	Conception	✓	●	✓	●	✓	●
	Proposal	✓	⊙	✓	●	✓	●
	Decision	✓	●	✓	●	✓	●
	Sustainability	✓	●	✓	●	✓	●
RP-C: Mapping Factors on EIS Phases	–	✓	●	✓	●	✓	●
RP-D: Prioritisation of the Factors on the EIS Phases	–	✓	●	✓	●	✓	●
● Fully Supported (Frequently Cited) ⊙ Moderately Supported (Moderately Cited) ○ Weak/No Support (Rarely Cited)							

Table 6-1: Summary of the Findings

6.1.1 Discussion on the Factors Influencing EIS in LGAs

In this section, the factors proposed in Figure 3.2 will be revised based on the empirical findings extracted from the case organisations.

6.1.1.1 External Environment

As with any other organisation in either the public or private sectors, adoption of technological innovation in LGAs is directly or indirectly influenced by the external environment they operate. In the context of this research, the findings illustrate that the effort of EIS through Inter-organisation Systems (IOSs) has been influenced by the Central Government and third party businesses. Moreover, these influences occurred as a result of the economic situation, as well as citizens' attitudes towards sharing personal information. However, the influence of these variables on the LGAs selected for this study was different and the stakeholders in each of the organisation had different views towards EIS. The factors within the external environment factor group are the only ones that are beyond the control of LGAs and cannot be influenced by the action of the departments. The discussion of each factor is presented below.

- Political Pressure:** Previous research on IOS adoption and EIS participation (e.g. Akbulut *et al.*, 2009; Gil-Garcia *et al.*, 2009; Robey *et al.*, 2008; Lee and Rao, 2007) illustrated that political environment of government agencies utilises strong institutional and situational influences on information sharing initiatives. The empirical findings of the case organisations suggest quite similar results. Table 6-2 summarises the importance of Political Pressure in the participation phases for each case study. As it can be observed from this table, political pressure has been influential mainly in the first phase, i.e. Incentive Phase. Also, the departments involved in sharing more sensitive information (e.g. details of children with disability) are more likely to be influenced by the decisions and directions of the Central Government. However, in LGA_NW and LGA_SE this factor did not receive a high priority among other factors in this category. One plausible explanation is that the Government has already announced mandatory measures (e.g., information sharing protocols) for sharing sensitive information among public departments. Therefore, the influence may become routine which becomes fully absorbed into the EIS decision-making processes for EIS.

Conversely, LGA_LON did not experience any pressure from Central Government while implementing and adopting the Integrated Waste Management System. The departments in LGA_LON considered the political environment as a positive influence rather than a negative imposition. This is primarily because the Head of ICT at LGA_LON holds a

senior position in Central Government ICO, which allows the authority to be more aligned with the policies and procedures regulated by the Government.

		Participation Phases				
Political Pressure	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	4/12	–	12/12	11/14	8/10
	LGA_SE	9/16	–	–	–	12/12
	LGA_LON	–	–	–	–	–

Table 6-2: Importance of Political Pressure

Based on the findings of the case organisations, it should be noted that the participating departments within one LGA did not receive the same level of influence from Central Government bodies. Due to limited resources of the government, it concentrated its efforts on specific departments, especially Social Care Services and Housing Service Departments. As the implementation and adoption of IOSs, unlike adoption of IS in a single firm, rely on a network collaboration of several departments and entities, the imbalance of influences would be problematic.

- **Economic Pressure:** Previous studies on information sharing and IOS adoption in the private and public sectors have largely focused on theories from microeconomics and transaction costs to investigate the formation of markets and the formulation of various channel decisions (Premkumar and Ramamurthy, 1995). Nonetheless, to the knowledge of the researcher, very few studies in the public sector (e.g. Fedorowicz *et al.*, 2007; Pardo and Tayi, 2007) have investigated the relationship between the macroeconomic environment and the adoption of IOS. The findings of this study seem to be inconsistent with the previous studies that illustrated a negative influence, in which the government agencies, as a result of economic situation, faced difficulties in regards to the implementation and adoption of inter-organisational systems.

The findings of the case organisations suggest that the economic situation in the UK has refocused attention on sharing personal information. The budget cuts imposed by Central Government have pushed LGA officials to realise that eliminating duplications in the back-office functions through application integration is a key strategic proposition towards

reducing the budget deficit and its effects. Table 6-3 explains that, although the Economic Pressure has not received a high score by the interviewees, the authorities have been influenced by the economic situation mainly in the first two phases of decision-making.

		Participation Phases				
		Case Studies	Incentive	Conception	Proposal	Participation
Economic Pressure	LGA_NW	7/12	5/11	–	–	–
	LGA_SE	13/16	–	–	–	–
	LGA_LON	8/17	12/16	10/15	–	–

Table 6-3: Importance of Economic Pressure

It can be argued that economic circumstances have had indirect effects on EIS initiatives in the authorities. The possible explanation is that the LGAs, in order to cope with approaching austerity and to address the Government's wish to protect frontline services, decided to take several approaches such as flexible working, inter-departmental collaboration, business processes re-design and enhancement of community engagement. None of the above tactics to transform the public service delivery is viable without a foundation of well-managed information assets.

In addition to these positive influences, it should be noted that the current economic climate has posed two negative influences on the effort of EIS. Firstly, the Central Government funding initiatives have become intensely competitive, in which the project managers and senior officials involved in the projects had to turn their attention outward more than they had expected to seek funding to sustain the effort. Secondly, the unparalleled austerity has posed risks of losing experienced and talented staff in the ICT services since they want to protect their interest by applying for posts elsewhere.

- **Legislation and Policy Principles:** The empirical data extracted from the case organisations support the proposition that the legislation and policies set by the relevant Government administrations significantly influence the decision of sharing personal information. In fact, throughout the participation phases, as it can be observed from Table 6-4, this factor is one of the most influential factors in the External Environment category. This appears to be aligned with previous findings indicating that legislation and policies

have been highly influential towards sharing personal information (Thomas and Walport, 2008; Cleaver *et al.*, 2004; Landsbergen Jr and Wolken Jr, 2001; Dawes, 1996).

		Participation Phases				
		Incentive	Conception	Proposal	Participation	Sustainability
Legislation & Policy	Case Studies					
	LGA_NW	8/12	3/11	–	6/14	–
	LGA_SE	3/16	4/13	–	–	9/12
	LGA_LON	13/17	6/16	3/15	–	10/14

Table 6-4: Importance of Legislation and Policy

Based on the findings it can be argued that the current legislation and policy frameworks that govern electronic information sharing in the UK have a negative influence on departments' participation in EIS. A possible explanation is that there is no single source of law, legislation or policy that regulates the collection, storing, use and sharing of personal information. There is a broad range of policies (e.g. Data Protection Acts, Human Rights Act and Children Act) set by different government bodies (e.g. Ministry of Justice and Information Commissionaire Office). As a result, the legal basis setting out whether and how personal information can be inter-departmental or inter-organisationally shared in any given conditions is often far from clear-cut.

Focusing on the Data Protection Act (DPA) 1998, as the main piece of legislation that governs the protection of personal data in the UK, it seems that the problem does not lie with its principles. Although those principles provide a sensible approach to handling and processing personal information, they neither prevent nor promote information sharing. The findings of this research indicate that the DPA does not and by itself cannot, offer a sufficiently practical framework for making decisions about whether or not personal information can be shared. It can be argued that this issue is more noticeable when it comes to sharing information through IOS, since its principles either do not cover or are in contrast with the notion of EIS. Moreover, this Act is normally interpreted too restrictively and over-cautiously by the departments as a result of unfamiliarity, misunderstanding and a lack of knowledge about its provisions. Based on the discussions with the interviewees, the DPA is commonly cited as a reason for not sharing information when it is absolutely legitimate to do so.

- **Community Pressure:** Based on the interviews and researcher's observations, it can be argued that tension between the goal of improving inter-departmental collaboration and the public's privacy represents a major challenge for the LGAs. The reports and surveys regarding public data and privacy clearly indicated that the British public is unwilling and reluctant to have personal information shared within and across government entities (Nash, 2008; Bellamy *et al.*, 2005). One possible reason for this unwillingness is the recent high profile data losses by public sector organisations that have reinforced the common belief that government organisations handle and share personal information with no respect. However, previous research has not widely investigated the influences of citizen's attitudes on decision-making of IOS adoption and consequently EIS.

The findings of the case organisations indicate that the low level of citizens' trust in local authorities' ability to share their information has had a negative influence on IOS adoption and department participation in EIS. Citizens' distrust has resulted in extra pressure on LGA employees limiting EIS. The level of importance of community pressure varies across the participation phases. As it can be observed from Table 6-5, the importance of this factor is more visible after the initiation of EIS started. LGA officials have realised that in order to sustain an efficient level of inter-departmental collaboration, enhancing the citizen's trust and confidence regarding information management is inevitable. That is why this factor has become more important in the Sustainability phase.

		Participation Phases				
Community Pressure	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	–	–	–	7/14	3/10
	LGA_SE	16/16	3/13	–	–	4/12
	LGA_LON	6/17	8/16	11/15	–	2/14

Table 6-5: Importance of Community Pressure

LGA_NW felt less community pressure compared to other authorities as the departments in the authority started to address this issue far earlier than the initiation of the Home-to-School project. Prior to the Participation Phase, the Information Sharing Officer assured the four departments involved in the project that the way the authority explains the use of

personal information to the community has been tremendously improved. The authority managed to increase the transparency of information sharing among its department through loads of “privacy notices” sent out to the relevant citizens by email, post, etc. LGA_SE, similarly, took several approaches to reduce community pressure through improving transparency. For instance, citizens became able to monitor which department was dealing with their request regarding waste collection through a real-time web portal. Citizens could also see what kind of information was held on them and they became aware of their rights so as to correct any errors that may occur. Therefore, it can be argued that improving citizen satisfaction through enhancing the transitions transparency directly influences the confidence and decision of LGA employees to adopt IOS and participate more effectively in EIS.

6.1.1.2 Capacity of Organisation

Based on the Diffusion of Innovation Theory (Rogers, 1995; Rogers, 1983) and the TOE Framework (Tornatzky and Fleischer, 1990), used as the basis of this thesis’s conceptual framework, one of the main contexts that influences the process of adoption and implementation of a technological innovation is the “Organisational Context”. It should be indicated that these two theories have been mostly used by IS researchers to study the adoption of technological innovation only from the perspective of a single organisation. Therefore, since the intention of this research is to examine the adoption of an inter-organisational initiative (i.e., EIS), in which decisions are made when several departments must collectively reach a decision, the organisational context has been examined in a slightly different direction. It can be argued that although the decision for adopting integrated systems to share information electronically are made between the LGA departments involved in the project, their decisions were influenced by the characteristics of the entire LGA. In simple terms, in the context of this research, the capacity of organisation refers to the capacity of the entire LGA and not their individual departments.

The factors affiliated to the organisational context are entirely dependent on the empirical research context and the technological innovation to be adopted. The analysis of several studies on different innovation adoption theories, such as adoption of open systems (Chau and Tam, 1997), Knowledge Management Systems (Lee *et al.*, 2009), CRM Systems (Racherla and Hu, 2008) and e-Government Applications (Srivastava and Teo, 2007), illustrates three common factors influencing the decision: management and leadership,

financial costs and ROI and organisational size. In addition to examining the above factors in this study, one more explanation – an explanation that has not been considered in the DIO and TOE – was examined for the adoption of EIS and that is Network Externalities. This notion was explained and discussed in Chapter 2. It was argued that when the adoption depends on the number of other users or departments who adopt that innovation, network effects should be taken into consideration. Therefore, as sharing information through IOS in LGAs depends on the network of departments that are collaborating, examining this factor is inevitable. It is worth mentioning that the majority of previous studies that focused on the adoption of different IOSs, such as Electronic Data Interchange (EDI) (Kuan and Chau, 2001) and Enterprise Resource Planning (ERP) System (Pan and Jang, 2008b), have failed to examine the effects of the “network”. In the context of this research, the notion of network externalities has been analysed through two factors, Network Collaboration Culture in the Capacity of Organisation Category and Inter-departmental Trust in the Inter-departmental Environment Category.

- **Inter-Organisational Leadership:** The empirical results illustrate that Inter-Organisational Leadership (IOL) has had a significant and positive influence on EIS in LGAs. In all three authorities the Head of IT/ICT had been identified as the project leader with the main role of assuring Central Government and Councillors support and maintaining simultaneous inter-departmental collaboration and communication. As it can be observed from Table 6-6, IOL influence is more viable during Conception and Proposal phases when the departments are forming a positive or negative attitude towards the innovation and while preparing inter-departmental protocols and Principles.

		Participation Phases				
Inter-org. Leadership	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	–	2/11	1/14	–	–
	LGA_SE	11/16	6/13	6/12	11/13	7/12
	LGA_LON	12/17	9/16	7/15	3/13	11/14

Table 6-6: Importance of Inter-Organisational Leadership

Previous studies, also, indicated the positive influence of leadership in cross boundary

collaboration and information sharing in a networked environment and focused on three key variables related to the concept of IOL; executive involvement, formal authority and informal leadership (Zheng *et al.*, 2009; Gil-Garcia *et al.*, 2007). Based on the findings, it can be argued that although the project leaders had no formal authority over the individual departments and their employees, they were still very supportive towards senior managers within the department involved in the EIS projects. In LGA_NW and LGA_SE, for instance, the Heads of IT (HIT) always supported the actions of the senior officials within other departments through participation in their internal business meetings regarding the project. Moreover, as a result of financial shortfall in the authorities, the role of the HITs was more influential as they were the main people responsible for making the financial resources available.

Based on different leadership approaches explained in Chapter 3, it should also be argued that none of the leaders in the three authorities relied on authoritative or pressure approaches to enhance the level of participation. The Head of IT in LGA_NW, for example, deliberately chose less forceful communication approaches with other departments when he could have used his power to be more directive. The reason was that the authority wanted to illustrate good explanations for building the inter-departmental network rather than imposing the directions without any rationale. Informal leadership also played a critical role in improving the participation in LGAs. For example, senior supervisors from the strategic partnership in LGA_LON significantly influenced the decision of the departments to adopt and use the Waste Management System. They actively worked with different groups of employees in order to find solutions for complex problems and clarify roles and responsibility.

The decision of adopting IOS and creating network collaborations within the departments in order to share information, on the other hand, changed the focus and attitude of the leadership. As the main purpose of implementing and adopting the integrated systems was to improve the effort of information sharing across departments, information had to be the key focus for the IOLs. However, throughout the projects, the LGAs realised that the leaders spent most of their time dealing with technology solutions and people involved in the effort rather than information. At the beginning of the Home-to-School projects, for example, the HIT focused mainly on selecting the best IT solution to integrate the back-

office operations, while the Integrated Children System leader concentrated on building trust and conflict resolution among different teams – in which information came last as the centre of attention. However, these attitudes changed throughout the projects by sharing the leadership between two senior officials from the IT/ICT department; a senior information officer with an information management role to increase the awareness of employees regarding the value and sensitivity of information and a senior technology officer dealt with IT architecture, IT capability and core technology decisions.

Based on the “Data Sharing Review” (Thomas and Walport, 2008) published by the UK Ministry of Justice in 2008, the importance of handling personal information is often undermined by a lack of visible leadership. However, the findings and arguments regarding Inter-Organisational Leadership presented above illustrate a substantial improvement in the way that leadership influences information sharing in LGAs.

- **Return on Investment (ROI):** Previous research indicated that in order to make inter-departmental collaboration and information sharing work, the implementation and adoption of IOS should be able to provide acceptable Return on Investment (ROI) to the participating departments (Lee and Rao, 2007; Dawes *et al.*, 2004). The empirical findings, however, illustrate that evaluating the projects ROI represents a relatively less important factor for EIS participation. This can be observed from the interviewees’ responses (Table 6-7), in which ROI has received almost the lowest rank, especially in LGA_NW and LGA_SE.

		Participation Phases				
Return on Investment	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	12/12	–	–	12/14	–
	LGA_SE	12/16	6/13	10/12	13/13	–
	LGA_LON	3/17	4/16	13/15	11/13	14/14

Table 6-7: Importance of Return on Investment

One of the possible reasons that the departments within LGA_NW and LGA_SE did not find ROI as an important factor is the lack of formal procedure to evaluate the return of IT-related projects investment. It can be argued that uncertainty about the size and

availability of future funds weakened the ability of the local departments to successfully examine the RIO. Developing, implanting and adopting IOS is considered as a large project, which may take up to 4-5 years. Central Government budgets and grants are handed to the local authorities on an annual basis and this may neglect long term planning. As a result, in some cases, the budget promised for a project in the first year may not be continued during the second subsequent years.

On the other hand, the influence of ROI on the Integrated Waste Management project in LGA_LON was more visible. It should be argued that LGA_LON was faced with more severe cuts in IT budget compared to the other two LGAs. Hence the officials had to focus on projects with faster ROI as they realised that, in this economic situation, IT-related projects were unlikely to go ahead unless they could assure a swift ROI.

- **Network Collaboration Culture:** Throughout the interviews and discussions with the interviewees, inter-departmental collaboration culture was repeatedly cited as one the most significant factors influencing EIS. It can also be observed from Table 6-8 that collaboration culture received a very high rating in almost all of the participation phases in LGAs. These findings reinforce those from previous research that identified collaboration culture has an important role in addressing issues such as demand for (a) IOS adoption (e.g. Ali *et al.*, 2011; Pan and Jang, 2008a), (b) more effective information sharing (e.g. Yang and Maxwell, 2011; Gil-Garcia *et al.*, 2009) and (c) enhanced collaboration among departments and other partners (e.g. Navarrete *et al.*, 2010; Mandell, 2001).

		Participation Phases				
		Incentive	Conception	Proposal	Participation	Sustainability
Network Coll. Culture	Case Studies					
	LGA_NW	2/12	6/11	7/12	2/14	2/10
	LGA_SE	2/16	12/13	8/12	2/13	2/12
	LGA_LON	14/17	14/16	5/15	5/13	3/14

Table 6-8: Importance of Network Collaboration Culture

Based on the case organisations, it can be argued that poor collaboration culture in the departments has had negative influence on EIS in all three authorities. It was clear from the discussions with the interviewees and observations that the effort of sharing

information, even via integrated and computerised systems that require less human involvement, was hindered by non-collaborative culture of the employees. One of the major barriers particularly in LGA_NW and LGA_LON cases was the fact that gaining the agreement of four different departments involved in the project was a complex task as some were more reluctant than others to share information. Moreover, the departments found it difficult to collaborate in the first place as each of them had their own definition of “personal information”.

Some departments, which were mainly involved with data of children and young people had more difficult to participate in information sharing than others. For instance, the Social Services Department in LGA_NW was often cited as the most difficult department to have on board. However, this issue was less significant in LGA_SE due to a higher level of employees’ knowledge. It could be argued, based on the findings, that network collaboration culture has a direct relationship with knowledge and training and less of a relationship to the sensitivity of information. For example, while collaboration within the LGA_LON’s departments – those involved in less sensitive information – was very slow and inefficient in some cases, collaboration in LGA_SE’s department –involved in more sensitive information but had more regular training – was much smoother.

- **Organisational Size:** Based on a meta-analysis carried out by Damanpour (1992) organisational size is one of the most commonly studied factors in the technological innovation literature. As per the DOI Theory (Rogers, 1995; Rogers, 1983) and TOE Framework (Tornatzky and Fleischer, 1990), organisational size has been found to have a positive influence with regards to the organisational inclination to adopt an innovation. The possible reason behind this proposition is that large organisations generally have more slack in their resources and therefore assign greater resources to the adoption process. However, the findings of the case studies indicate a contradictory result; the influence of the authority’s size was insignificant in two of the cases (i.e. LGA NW and LGA_SE) and negative in one (i.e. LGA_LON). As it can be observed from Table 6-9, Organisation Size received the lowest rank in almost all of the participation phases.

		Participation Phases				
Organisation Size	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	–	–	11/12	10/14	9/10
	LGA_SE	–	5/13	11/12	10/13	–
	LGA_LON	16/17	16/16	–	13/13	13/14

Table 6-9: Importance of Organisation Size

The potential reason that organisation size was not recognised as a factor influencing the departments' decisions in LGA_NW and LGA_SE is that the adoption of the IOSs involved some specific departments and not the entire organisation. For example, the Home-to-School system in LGA_NW was a specialised system to be adopted by just four departments. Hence, the context of the entire LGA becomes irrelevant. Based on the interviewees' perspective, as the structure of the local authorities is more decentralised, the size of the each department or a network of departments should be considered as an influential factor.

Although the influence of the organisation's size in LGA_LON was also insignificant, the discussions with the interviewees illustrate a negative relationship between EIS and the organisation size. It could be argued that although the larger authorities receive more grants from the Central Government, they have more fragmented legacy systems built over years. Therefore, implementation and adoption of IOSs may be confronted by difficulties due to inconsistencies in the infrastructure. Therefore, organisation size would have significant and positive influences in the decision-making processes when the innovation is to be adopted by a single firm, rather than by a network of firms or, in this case, departments.

6.1.1.3 Technology Environment

Through the two previous contexts (i.e., External Environment and Capacity of Organisation), the influence of social, managerial and organisational factors on sharing information via IOS in LGAs were discussed. In this section, the impacts of technological factors and the EIS attributes will be explained. Based on the DOI theory and TOE framework, technological context strongly influences the decision-making process for innovation adoption. Previous studies have considered different technological variables that

fit into their context. In this study, based on the relevant literature on inter-departmental collaboration and IOS adoption in local government (explained in Section 3.2.3), the technological environment has been divided into four main categories : (a) IT Capabilities, (b) Data Security and Privacy, (c) Information Quality, (d) Interoperability Framework.

- ***IT Capabilities:*** The IT capability of the LGA departments was examined through three key variables; IT infrastructure, IT sophistication and IT knowledge. Although the interviewees had different arguments regarding the IT capabilities in their organisations, generally speaking, the feedback and findings illustrate that this factor has had a highly significant, but negative impact on the decision-making process for IOS adoption and EIS participation. It could be argued that all three organisations faced significant integration problems as the IT infrastructure, sophistication and the level of IT knowledge among the departments involved in the projects were significantly imbalanced.

Yet again, this issue is among those that have not been covered in the DOI or TOE, since the main focus of the two theories is adoption of innovation by just one firm. This great variation in the technological capabilities was the main reason that the department had to develop and implement completely new systems from scratch, since integration and sharing information through the old heterogeneous platforms was impossible. This increased the total cost of the projects and the risk of adoption. Therefore, it could be argued that one of the critical success factors of such projects that required to be adopted by a network of departments primarily is to build a reasonable and balanced infrastructure among the members of the network.

The findings of the case organisations also suggest that selecting the right IT vendor(s) that have the ability and capability of developing and implementing such large integrated systems was a great challenge in LGA_NW and LGA_SE. However, this issue was not visible in LGA_LON as the authority had a strategic partnership with a large private IT company, in which the entire integration system was designed and developed in-house. This influenced the level of training of the end-users (i.e. departments' employees), representing another aspect of the IT capability. As noted earlier, LGA_NW and LGA_SE purchased and implemented vendor-provided applications and therefore heavily relied on the training provided by the private vendors. Based on the interviewees, the trainings

was “patchy” and slow due to the unfamiliarity of the providers with the working environment in the local authorities. On the other hand, in LGA_LON where the applications were developed mostly in-house, both IT department and their strategic partner shared the responsibility of training. Based on the researcher’s observation, the level of understanding and addressing of technical problems among the employees in LGA_LON was far more advanced compared to the other LGAs.

As it can be observed from Table 6-10, IT capabilities received very high scores in the first three phases of participation. The possible reason is that throughout implementation and adoption, the technological capabilities of the LGA departments rigorously improved and therefore this factor became less influential in the last two phases of participation. These findings are in accordance with previous research (e.g. King and Cotterill, 2007; Kim and Bretschneider, 2004), which indicated IT infrastructure and the level of training in local authorities as two significant factors influencing collaboration initiatives.

		Participation Phases				
IT Capabilities	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	5/12	4/11	4/12	13/14	–
	LGA_SE	8/16	10/13	5/12	7/13	–
	LGA_LON	4/17	3/16	12/15	10/13	–

Table 6-10: Importance of IT Capabilities

- **Data Security and Privacy:** The empirical findings of the case organisations suggest that data security and privacy have moderately influenced the decision-making processes of the departments. This result can also be observed from Table 6-11, in which this factor received moderate scores throughout the participation phases.

		Participation Phases				
Data Security and Privacy	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	9/12	7/11	5/12	8/14	–
	LGA_SE	6/16	7/13	9/12	8/13	11/12
	LGA_LON	11/17	13/16	4/15	6/13	12/14

Table 6-11: Importance of Data Security and Privacy

Although the results of the prioritisation do not emphasise the fact that data security and privacy have a strong influence on EIS, the discussions with the interviewees and the researcher's observation of the projects illustrate that the tension between the goals of improving the inter-departmental collaboration through IOSs and protecting citizens' privacy represents a major challenge in the LGAs. These findings concur with previous studies on information sharing in public sector (Nash, 2008; Bellamy *et al.*, 2005; van Blarkom *et al.*, 2003) that indicated citizens' privacy and data security as two major factors influencing the decision of departments to share or not to share personal information with other departments/firms. However, it is worth mentioning that to the best of the researcher's knowledge, previous studies that examined innovation adoption with DOI or TOE in the private sector domain (e.g. Racherla and Hu, 2008; Chau and Hui, 2001) have not emphasised data security and privacy as factors influencing innovation adoption processes.

Based on the case organisations, it should be argued that the operational requirements as well as citizens' privacy demand a high degree of data security and accuracy, higher than the implemented systems and procedures can currently provide. It is clear that, even after implementing the integrated systems in LGAs, the employees are not quite sure in what circumstances they can share information, or when they need to have citizens' consent to share information with other departments. This has a direct relationship with the principles and legislation set by either Central Government or the LGA itself. Most of the authorities in the UK have published a document called "Inter-agency Information Sharing Protocol" to provide the basis for an agreement between the LGAs, their departments and other associated organisations, to facilitate and govern the effective and efficient sharing of information. However, the findings of this research indicate that these protocols are not used in day to day practices. The plausible reason is that while, in principle, there may be some degree of compatibility between information sharing and right to privacy, compatibility may not be capable of being fully comprehended in practice, especially when the effort is carried out through advanced integrated platforms. That is why just in the first six months of 2012, more than 11 councils received huge fines due to disclosure of sensitive data.

- **Information Quality:** As it was explained in Section 3.2.3, previous studies indicated Information Quality (IQ) as one of the key factors influencing inter-departmental collaboration and information sharing through computerised platforms (Klischewski and Scholl, 2008; Li and Lin, 2006; Peak and Guynes, 2003). In the context of the case organisations, the empirical data and interview sessions suggest a similar conclusion that IQ was among the factors that significantly influence the adoption of IOSs and decision-making about sharing information. Based on Table 6-12 that illustrates the importance of IQ throughout the participation phases, it is clear that this factor has been moderately important in the first three phases and became highly important towards the end of the process. The possible explanation is that the meaning of information may change over time so as its usefulness even for the same users; therefore IQ should be defined relative to its actual practical use, which is when the projects get closer to their “go-live” phase.

		Participation Phases				
Information Quality	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	–	8/11	8/12	3/14	1/10
	LGA_SE	10/16	8/13	7/12	3/13	10/12
	LGA_LON	15/17	11/16	8/15	2/13	4/14

Table 6-12: Importance of Information Quality

It could be argued that the notion of IQ becomes more important in the context of inter-organisational systems since, unlike projects within a single organisational unit, inter-departmental projects involve several entities with diverse understanding of IQ and various missions and purposes. As some of the department previously were not dealing with sensitive information, the level of IQ was not in their centre of attention. However, if the department intends to share information in some meaningful fashion (i.e., through IOSs), it is evident that such collaboration efforts require certain IQ standards that are well-adjusted among the participating entities.

Based on the cases, it should be noted that the departments carefully considered IQ standard as one of the most important initiatives while implementing and adopting the system. For instance, Information Quality Assurance Protocol was embedded in the Home-to-School Integrated System in LGA_NW to monitor and improve the quality of

records of families and children using the service. Similarly, IQ was identified as one of the key motivations for adopting the ICS project in LGA_SE. The officials in the authority managed to improve the IQ by appointing six Data Support Officers inspecting the data quality during the migration to the new system. Moreover, by considering the Citizen Index Database in the Integrated Waste Management System in LGA_LON, the information flow was continuously monitored and had to be matched with the Central Government Gateway to assure that the level of data accuracy was balanced across the departments.

- **Interoperability Framework:** Several studies in information sharing in the public sector (e.g. Gil-Garcia *et al.*, 2007; Scholl, 2005) indicated that creating the ability and being successful in information sharing efforts via integrated systems rests in part on organisational and technological interoperability. According to the UNDP (2007) some countries, including the United Kingdom, have drafted their e-Government Interoperability Framework (GIF) that set out the policy and technical structure by which public services are developed in order to ensure a coherent flow of information across systems and departments. In the UK, the interoperability framework (i.e. e-GIF), available in a document called “e-Government Interoperability Framework Version 6.1, 2006” is a set of policies and standards, which enables information to flow seamlessly across the UK public sector.

The empirical findings of the case organisations, however, suggest that the Interoperability Framework has not been significantly influential on the decision of the departments in EIS. As it can be observed from Table 6-13, this factor received very low scores in almost all of the participation phases. One of the main possible explanations is that apart from the IT/ICT departments, the managers in other departments were not familiar with the eGIF and arguably were their first time to come across such a term. Therefore, they were not confident to make any comment on it. This clearly shows that the framework has not been universally applied across government organisations of different levels.

		Participation Phases				
Interoperability Framework	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	–	10/11	6/12	–	10/10
	LGA_SE	14/16	13/13	–	–	5/12
	LGA_LON	10/17	15/16	15/15	–	6/14

Table 6-13: Importance of Interoperability Framework

Based on the discussions with the senior officials in LGA’s IT/ICT departments, it could be argued that the UK’s eGIF has specified long lists of detailed standards, which have brought confusion to the development and implementation of the systems. The government has mandated the use of standards that are not widely used in the private sector and this, as they called it “technical over-engineering”, increased the risk of isolation between the LGAs and their partners from the private sector. Moreover, the interoperability agenda is very much technically-driven rather than socio-technically-driven. This is another reason why the LGAs are insisting on not considering the framework as the main strategic outline for sharing information since it distracts attention and resources from more important issues they face including organisational and cultural.

6.1.1.4 EIS Characteristics

Previous studies on innovation adoption have considered the characteristics of innovation, mainly, in the technology context (e.g. Pan and Jang, 2008a; Racherla and Hu, 2008; Kuan and Chau, 2001; Chau and Tam, 1997). In this research, however, a distinction has been made between the technology and the innovation (EIS) characteristic context since not all of the innovation attributes are technological. Furthermore, previous diffusion research mostly examined the adoption of innovation by individual adopters (e.g. individual organisation or firm) and measured the characteristics of innovation as perceived by them (Damanpour and Schneider, 2009). Nevertheless, when the adoption relies on a network of adopters, the characteristics and attributes should be examined differently as they become mutual among the adopters. For example, adoption of an innovation may be more beneficial to one of the entities in the network and less for others. Therefore, the attitudes towards the innovation adoption become diverse. It can be argued that DOI and TOE do not offer adequate constructs to deal with collective adoption behaviour.

The results indicate that innovation characteristics (especially cost and risk of EIS) are the most significant variables influencing innovation adoption beyond the influence of environmental, organisational and technological factors. In the following subsection, the discussion on how each of these factors influenced departments' decisions towards EIS will be discussed.

- **Cost of EIS:** The cost of implementing and adopting the IOSs in the departments was among the most cited factors by the interviewees. The empirical data suggest that the effect of costs on the departments' decision-making in adopting IOSs and sharing information electronically with other departments is highly significant and positive. This is in contrast with the previous studies on innovation adoption in the public sector (e.g. Kamal, 2006; Ebrahim and Irani, 2005) and information sharing initiatives, (e.g. Fedorowicz *et al.*, 2010; Akbulut *et al.*, 2009), which indicated that the cost of innovation has a negative influence on the adoption decision.

It could be argued that, prior to the initiation of EIS in LGAs, the maintenance cost of diverse and heterogeneous information systems was severely high. Through several cost/benefit analyses carried out by the IT/ICT departments, the senior officials realised that integration of the technical and organisational layers would save millions of pounds. For example, based on a report by the Business Transformation Unit in LGA_LON, the front/back office integration and the IWM System would save the authority about £3m in ten years. The LGAs effortlessly managed to justify their costs before the final decision on purchasing or developing the systems. The main focus was on software and application costs, immigration costs and staff training costs. Therefore, this factor played an inspiring role in order to push the LGAs to establish such initiatives within their departments.

Table 6-14 also supports this proposition and illustrates the high importance of the Cost on EIS decision-making. As it can be observed, in LGA_SE and LGA_LON, this factor is among the top five factors in almost all of the phases. However, in LGA_NW the interviewees put less weight on this factor compared to the other two authorities. The possible reason is that the departments in LGA_NW went through a pilot project, in which they became more familiar with the areas that need more attention and more budget injection.

		Participation Phases				
Cost of EIS	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	11/12	9/12	–	9/14	–
	LGA_SE	5/16	2/13	2/12	6/13	–
	LGA_LON	2/17	2/16	1/15	4/13	9/14

Table 6-14: Importance of Cost

It is also worth mentioning that several Heads of departments in the selected LGAs had a similar opinion that the cost of implementing and adopting a proper information management system will be far more less than the cost of any regulatory action (i.e. penalties) that may be taken against them as the result of poor information management and information breaches. This attitude from the senior level of the departments clearly justified the LGAs' Councillors to allocate more budget on improving the information management initiatives in the authorities.

- **Benefits of EIS:** In many of the previous innovation adoption studies, perceived benefits as a factor that influence innovation adoption has been drawn from the Iacovou *et al.*, (1995) model, which examines the adoption of Electronic Data Interchange (EDI) in organisations. They argue that perceived benefits of innovation would positively influence the adoption process. This is in accordance with the findings of this study. The empirical findings of this research suggest that the perceived benefits of EIS moderately influence the decision of the departments to participate in information sharing. Moreover, the results illustrate that the awareness of the departments about the perceived benefits positively influence the decision-making of participating in EIS.

Based on the discussion sessions with interviewees, it can be argued that tangible benefits, compared to intangible ones, have had more influence on the departments' decision to adopt the integrated systems and participate in EIS. For instance, in LGA_NW and LGA_SE reducing the costs of maintaining several information systems, improving information quality and accessibility and reducing paper-based information flow were among the main benefits considered by the departments. Furthermore, the empirical

findings suggest that pre-adoption awareness of EIS benefits is quite low among the department. As it can be observed from Table 6-15, perceived benefits of EIS significantly become influential after the department participated in EIS. A possible explanation is that the awareness of expected benefits among the departments was quite low.

		Participation Phases				
Benefits of EIS	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	10/12	–	9/12	14/14	6/10
	LGA_SE	–	–	–	9/13	3/12
	LGA_LON	9/17	10/16	6/15	9/13	5/14

Table 6-15:Importance of Benefits

The findings of the case organisations indicate that recognising mutual goals of participating in the information sharing effort had limited the expectation of EIS benefits. One of the main reasons is that some of the variables such as improving information timeliness and information accessibility may be more beneficial to just one or two departments and not to the entire collaboration network. Moreover, this may be due to differences in departments' expectations and assumptions of the key aspects of EIS initiative including its benefits.

- **Risk of EIS:** The empirical findings of the case organisations indicate a strong and negative relationship between risk and EIS in LGAs. Especially in LGA_NW and LGA_SE, as it can be observed from Table 6-16, this factor is the most important factor influencing EIS throughout the participation phases. These findings are in accordance with previous studies (e.g. Gil-Garcia *et al.*, 2007; Bellamy and Raab, 2005; Dawes, 1996) that indicated perceived risks bring uncertainty to inter- and intra-organisational collaboration and limits the effort of information sharing among the entities.

		Participation Phases				
Risk of EIS	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	1/12	1/11	3/12	1/14	5/10
	LGA_SE	1/16	9/13	1/12	4/13	6/12
	LGA_LON	7/17	7/16	–	7/13	7/14

Table 6-16:Importance of Risk

The findings of the case studies suggest that the departments are mainly concerned about non-technological risks. Based on the discussions with the interviewees, three frequently cited risks can be summarised as: (1) accessibility of personal information by other departments (issue of information ownership), (2) misinterpretation of the shared data and (3) losing accountability and public image. The departments were particularly concerned about making the personal information collected and stored by them available to others. The possible explanation is that the departments were keen to have full control over the information collected and think that by sharing information they would lose information ownership. Relying on just one IT provider was one of the few technological risks identified by the interviewees. The argument was that although the selected IT firms are experts in developing and implementing integrated systems, they are not familiar with the level of information sensitivity and the consequences of any data breaches.

It can be argued that current legislation governing EIS at a local level is not able to reduce the risks of information sharing. Moreover, the findings suggest that the LGA departments do not have a specific risk assessment framework to reduce the impacts. However, after implementing IOSs and by the time when the departments were about to share information electronically, the attitudes towards the risks of EIS positively changed. The senior officials realised that computerised systems, even though they carry new risks, can also provide new and better safeguards for handling personal information; for instance, improved control over access. Moreover, it could be noted that the notion of “risk sharing” reduced the impacts of risk on decision-making towards EIS. The departments recognised that through collaboration with other department, the risk of data breaches can be decreased since more employees control and monitor citizens’ information.

6.1.1.5 Inter-departmental Environment

As it was discussed earlier in Chapter 2, IOS adoption in local authorities relies on interaction among departments and other governmental third parties. Extant DOI or TOE-based studies has not examined how decisions are made when several departments must reach a decision about a new technological innovation. Moreover, those studies have failed to examine the adoption processes in circumstance when the value of an innovation depends on the number of other users and entities who adopt that innovation (Baker, 2011). Therefore, by taking the inter-departmental environment into consideration, this section moves the research a step

forward and analyses the context of individual departments and the interaction between them. To examine the inter-departmental environment, two well established theories were found relevant; Social Exchange Theory (Emerson, 1976) to understand the relationship between the departments and Critical Mass Theory (Bouchard, 1993) to examine the impacts of the collaboration network on the adoption decision. But first, based on the empirical findings, the compatibility of business processes among the departments will be examined.

- **Business Process Compatibility:** The empirical findings from the case studies suggest that business process compatibility plays a significant role on decision-making of adopting integrated systems and sharing information. As it can be observed from Table 6-17, that this factor has received a very high score in almost all of the participation phases, which highlights the significance of process compatibility in regards to EIS.

		Participation Phases				
		Incentive	Conception	Proposal	Participation	Sustainability
Business Process Compatibility	Case Studies					
	LGA_NW	–	–	2/12	4/14	4/10
	LGA_SE	7/16	1/13	3/12	5/13	8/12
	LGA_LON	1/17	5/16	9/15	8/13	8/14

Table 6-17: Importance of Business Process Compatibility

In fact, this factor was among the few factors that the LGA departments, by planning in advance, managed to address. For instance, LGA_NW and LGA_SE went through an extensive business process mapping to examine the responsibility of each department regarding the collected information. LGA_LON also initiated business process re-engineering programmes to align the non-technological processes in the departments involved in the IWM Systems. However, it can be argued that underestimating the time required for re-engineering business processes had negative influences on the implementation and adoption of the projects.

The plausible reason is that business processes in LGAs, in general and those departments that dealt with personal and sensitive information, specifically, are very inflexible. Therefore, transforming the processes in order to be in line with other departments would be extremely complex, time-consuming and expensive. These results support Beynon-

Davies and Williams' (2003) arguments, which highlight the fact that in the UK public organisations, especially at a local level, do not enough place emphasis on the re-engineering of business processes as the result of bureaucratic organisational structure. It could be noted that while the use of the integrated systems were moving into operational phases, the willingness to support the re-engineering of the processes improved among the departments' employees. The main reason is that the overall knowledge and understanding of a mutual business process across the departments involved in the EIS initiative was increased.

- **Inter-departmental Trust:** Another significant difference between examining the adoption of an innovation and adoption of an inter-organisational innovation is that trust among the participating entities becomes an important matter. The empirical results illustrate that inter-departmental trust has significant and negative influence on EIS in LGAs. Based on Table 6-18, this factor has been the most important factor influencing the final decision and the sustainability phase of information sharing in LGA_SE and LGA_LON. It was observed that the relationship among the departments involved in the projects have been problematic to some extent due to the low level of trust. It can be argued that the absence of formal structures to support cooperation and the existence of competitive relationships in LGAs has led to the low level of trust among the departments involved in children services. This argument supports previous research on trust in cross-boundary information sharing initiatives (e.g. Cresswell *et al.*, 2006; Pardo *et al.*, 2006) that claimed that the level of trust is directly influenced by pre-defined cooperation policies and the level of competitiveness. Moreover, the low level of inter-departmental trust has occurred not just because of competitive relationships among the participating departments or lack of leadership (Cresswell *et al.*, 2006), but because of fears about the incompetency of other departments participating in EIS.

		Participation Phases				
Inter-dep. Trust	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	3/12	11/11	10/12	5/14	7/10
	LGA_SE	4/16	10/13	4/12	1/13	1/12
	LGA_LON	5/17	1/16	2/15	1/13	1/14

Table 6-18: Importance of Inter-departmental Trust

Social exchange theory (Emerson, 1976) suggests that, in an inter-organisational environment, power has a direct relationship with trust. Issues regarding imbalanced power among the participating departments seem to be significant contributors to distrust and to the hampering of trust building. The findings of the case organisations reveal that prior to implementing the systems lack of trust between the departments was more visible and was one of the main interrupters of information sharing efforts. The possible reason was that the departments that had initially collected the information in the first place were the powerful side of the networks and were not confident to share it with others.

It could also be argued that by the initiation of the IOSs, inter-departmental trust vividly improved. The possible explanation is that the implementation and adoption of the integrated systems brought a “shared-power” among the participating departments. Another reason was the fact that, by implementing the new integrated platforms, information sharing became more formal, structured and legislation governed the processes. Hence, the confidence for sharing information among the departments progressively improved.

- **Critical Mass:** This factor initiated from Critical Mass Theory (Bouchard, 1993), which examines the adoption of those innovations that require collaboration of several adopters. The empirical findings suggest that critical mass has not been influencing the decisions of the departments regarding the adoption of IOSs and sharing information. As it can be observed from Table 6-19, this factor has either not been recognised by the interviewees or receives a very low score in terms of its importance in the decision making processes.

		Participation Phases				
Critical Mass	Case Studies	Incentive	Conception	Proposal	Participation	Sustainability
	LGA_NW	6/12	–	–	–	–
	LGA_SE	15/16	–	12/12	12/13	–
	LGA_LON	17/17	–	14/15	12/13	–

Table 6-19: Importance of Critical Mass

It seems that the findings of the case studies are not aligned with the previous research that indicated critical mass is an important factor influencing the adoption of integrated

systems (Chwelos *et al.*, 2001) and positively affects the participation of public local agencies in EIS (Akbulut *et al.*, 2009; Akbulut, 2003). It could be argued that the LGA departments were not affected by the action of other departments involved in the same project when they were making their decision for sharing information electronically. One of the main possible explanations is that the resources and capability (budget, staff skills, etc.) are not balanced within the departments in LGAs; hence they cannot follow the same path as others have gone through.

Moreover, adoption of IOSs and sharing information electronically in LGAs are in the early stages of initiation. Therefore, based on the discussions with the interviewees, there is no leader among the authorities that have been entirely successful or unsuccessful in such efforts, hence the notion of critical mass is still too early to examine. It can also be argued that as a result of poor communication among the LGAs in the UK, the authorities are not aware of any EIS initiatives that was successfully implemented and adopted in other authorities. Therefore, based on these findings, it can be argued that critical mass would not influence the departments' participation in EIS effort.

Based on the empirical results and examining the importance of the factors influencing inter-departmental EIS, it is possible to advance some specific statements about the configuration of each of them in the context of local authorities in England and Wales. The statements are summarised in Table 6-20.

Political Pressure	There is strong pressure from Central Government regarding promotion and establishment of an appropriate environment for implementation and adoption of IOSs and EIS in LGAs.
Economic Pressure	The economic situation in the UK has refocused attention on sharing personal information and pushed LGAs to establish such initiatives in order to address their budget downfall.
Legislation and Policy	There is a set of legal provisions governing information sharing efforts, but lack of clarity and integrity among them has negative influences on the initiative.
Community Pressure	The community's distrust in LGAs ability of handling personal information has resulted in extra pressure on the employees and in many cases limited the effort of EIS.
Inter-Org. Leadership	There is strong inter-organisational leadership in LGAs' with positive attitudes and will towards inter-departmental information sharing.

Return on Investment	Evaluating the projects' ROI represents a relatively less important factor for EIS participation due to uncertainty about the size and availability of future funds.
Collaboration Culture	Poor collaboration culture in the departments had negative influence on EIS in all three authorities. Gaining the agreement of different departments involved in the project is a complex task as some are less reluctant to participate.
Organisational Size	Since just some specific departments get involved in the integrated projects, the size of the entire LGAs were not found to be significantly influential.
IT Compatibility	There is not enough knowledge about the IT compatibility in LGAs. Lack of an evaluation framework for selecting the right vendor and technology has weakened the participation in EIS initiative.
Data Security & Privacy	There are mechanisms for information security that allow the preservation of citizens' privacy and this has positively influenced the decision for sharing information with others.
Information Quality	Information quality has moderately influenced the decisions in their initiation phase and become significant as the projects move toward their operational phases. An embedded and high IQ standard has positively influenced participation.
Interoperability Framework	Lack of awareness about the existence of interoperability frameworks and confusion over a large number of standards has limited the implementation and adoption of the EIS initiative in the LGAs.
Cost of EIS	The realisation of saving cost through implementing and adopting the integrating systems has significantly and positively influenced the decision of the departments in the EIS effort.
Benefit of EIS	The pre-adoption awareness of EIS benefits is quite low among the departments and this has resulted in benefits of EIS moderately influencing the decision to share information inter-departmental.
Risk of EIS	The most significant concerns of the three LGAs were the risks of accessibility to personal information by others, misinterpretation of shared information and losing public accountability.
Business Process Com.	Extensive business process mapping to examine the responsibilities of the involved departments has significantly improved the quality of decision making towards EIS effort.
Inter-departmental Trust	The lack of adequate levels of inter-departmental trust has significantly limited the implementation and adoption of EIS initiatives in LGAs. This has mainly occurred due to the fears about the incompetency of other departments participating in EIS.
Critical Mass	Due to imbalanced technological and human resources and capabilities among the departments in LGAs, critical mass effects did not significantly influence the decisions about adopting the integrated systems.

Table 6-20: Specific Statement Describing the Configuration of each Factor**6.1.2 Additional Factors Influencing EIS in LGAs**

During the discussions with the interviewees in LGAs, several new factors, previously unconsidered emerged. Regarding the external environment, the empirical findings illustrate that “*Critical Events*” such as elections in Central Government have significant impacts on EIS within the departments. The interviewees argued that each party in the United Kingdom has different views on using IT/ICT in local authorities, as well as the level of funding that they allocate to initiatives such as IOSs. Therefore, changes in administrations from one party to another, significantly influence the strategies and policies regarding the IT projects. It could also be noted that pressures from the “*Media*” have a strong influence on local authorities’ day-to-day operations. In case something goes wrong in LGAs, especially when handling sensitive information, the authority will be severely scrutinised by the media. This has brought intense pressures on LGA employees and decreased the willingness of sharing information with others. Another pressure from outside the authorities that influences the decision about inter-departmental EIS is “*Competitive Pressure*”. Regarding the case organisations, competition refers to the level of productivity and effectiveness in terms of service delivery towards the public that, in turn, increases the level of funding from Central Government. The interviewees argued that if their authority proposes a better plan for public service management – e.g. through integrating corporate functions, they will have more chance to secure a full grant from the government for developing and implementing the projects.

In the organisational context, the empirical findings suggest that the local authorities do not adopt any “*Evaluation Framework*” prior to the final decision concerning purchasing and implementing IOSs. The interviewees stated that there is no formal procedure for market research regarding the integrated solutions and packages offered by private firms. Among the selected LGAs, just LGA_LON by supporting its internal business partner went through formal comparisons of different integration solutions for the IWM project. Previous studies (e.g. Kamal, 2006; Themistocleous, 2004) argue that since the integration marketplace is extremely confusing with a wide range of packages and tools, there should be formal evaluation frameworks to assist the organisation in selecting the right solution. Moreover, the interviewees in LGA_SE and LGA_LON clarified that the level of funding not for the actual development and implementation but for the *Research and Development (R&D)* phase

influences their decision to adopt the IOSs. They argued that such projects are very risky and require planning in advance. However, shortage in LGAs' budgets does not allow them to do research phase and this brings some concerns about the projects' best outcomes.

In terms of the technology environment, it can be argued that the LGAs' "*IT Strategies*" have had a major role in IOSs adoption and the departments' participation in EIS. The strategy can mainly assist the LGAs in their technical operations, for example the purchase and design decisions about proprietary versus open sources software and network architecture. However, based on the empirical results, just LGA_LON has successfully prepared its IT strategy with the purpose of setting out the vision for the use of ICT to improve customer services and business efficiency. This strategy mainly focuses on performance measure, timescale, funding and responsibilities with regards to three main Principles: IT governance, information management, and partnership programme. The Data Services Manager in LGA_LON indicated that the two most important features that the IT strategy has brought into the organisation are "delivery time-scale" and "key responsible" of any IT projects.

Another important technical factor that is frequently cited by the interviewees was "*Data Ownership*". In fact, based on the empirical findings, this factor has rigorously hindered the actions of the departments regarding EIS effort. It could be argued that none of the 12 departments included in this study was able to tackle and solve this issue. Although most of the interviewees were comfortable with the concept of information sharing, they tended to be more uncertain about the actual location and ownership of data. Lack of corporate governance along with the dispersed responsibility for information management were among the main issues that have resulted in a lack of information ownership.

Lastly, the findings of the case organisations suggest that the size of the LGAs is not as influential as the size of the collaboration network – i.e., number of departments that are involved in IOSs adoption and EIS effort. Since just some specific departments are typically involved in implementation and adoption of the IOSs, the interviewees did not recognise the organisation's size as a factor that influences their decision, but rather emphasised the size of their department and the collaboration network. A greater difference between the size of the departments involved in the adoption process will make the effort more problematic as the level of staff expertise and amount of information they are handling are imbalanced. This is also related to the issue of power, in which the bigger departments with larger resources play

the powerful side of the collaboration. Although it could be argued that the departments would have taken the final decision about sharing information with others anyway, the imbalanced power among them will hinder the effort, which may be costly and risky.

The revised version of factors influencing EIS is illustrated in Figure 6-1.

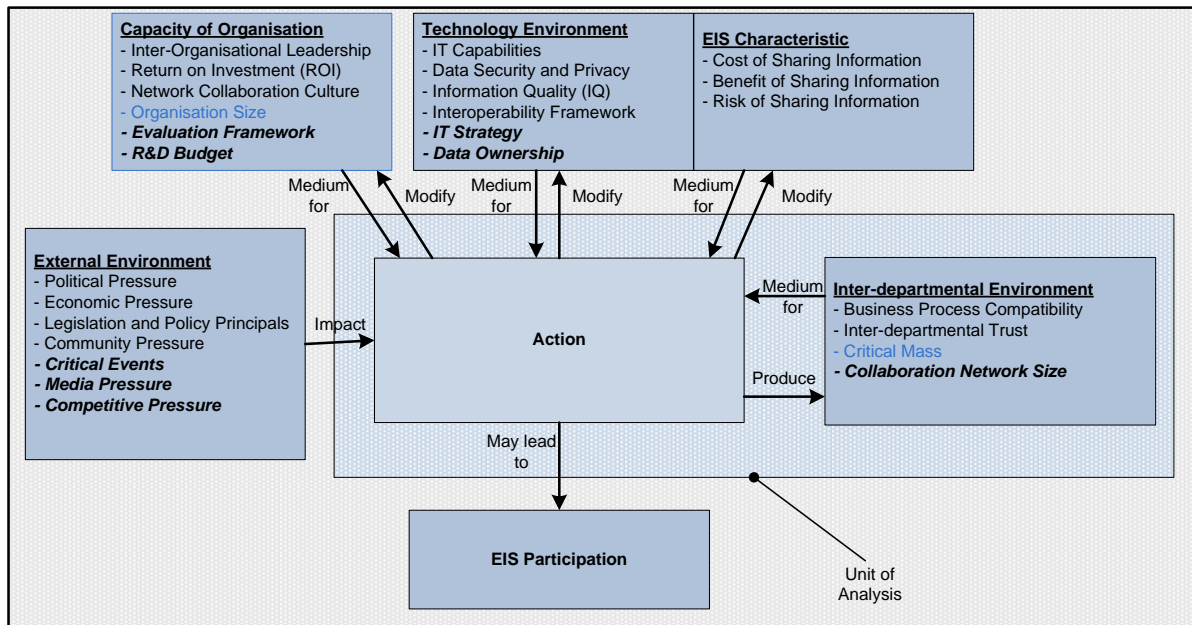


Figure 6-1: Revised Factors Influencing EIS in LGAs

6.1.3 Discussion on the EIS Participation Phases

As it was discussed in Chapter 3, information sharing through IOSs should be considered as an innovation since it enables reengineering and transformation of the existing processes and workflows in an organisation. Hence, it could be argued that such as any other innovation adoption initiative in any organisation, LGA departments go through several phases prior to sharing information.

The empirical findings of the three case studies highlight the existence of the participation lifecycle and point out that the LGA departments adopt the four phases prior to participation in EIS and then reach the sustainability phase. However, it could be argued that there is no clear line between these phases while making the decisions regarding the adoption of IOSs and participation in EIS. The possible reason could be the lack of formal written procedure in regards to the phases that the departments should go through prior to the final decision. This, based on the discussion with the interviewees, significantly extended the project delivery

time and in some cases made the implementation process so disordered.

Analysis of the interviews' transcripts and prioritisation of the factors with AHP emphasise that external factors and EIS characteristics are more influential in the early stages of the projects (i.e. Incentive and Conception) when the departments form a positive or negative attitude towards EIS and examine whether or not the legal basis for sharing information is in place. This finding is quite remarkable since it illustrates that the first perception towards the innovation is influenced not by the organisational, inter-departmental and technological capability of the LGAs, but rather by the pressures from outside and characteristics of the innovation itself.

By the time when the departments started to analyse their resources and capability in order to participate in information sharing (i.e. Proposal Phase), EIS characteristics and technological factors were among the highest ranked factors. When the departments passed through the first three phases they became confident about some key issues including why information should be shared, how this sharing will be managed and under what circumstances sharing is prohibited. Based on the prioritisation of the factors, it could be argued that the final decision to adopt the integrated systems in order to share information electronically in almost all three case studies was significantly influenced by four main factors: network collaboration culture, information quality, risk of EIS and inter-departmental trust. This illustrate that although some of key IT issues such as IT compatibility and technological infrastructure have been addressed and the departments were merely ready for the operational phase, there were still some great concerns over key organisational and inter-departmental issues.

It could also be noted that prior to the interview sessions, none of the LGA departments were practically considering the Sustainability phase. One of the possible explanations is that the projects in the three LGAs are in the early stages of operation. The interviewees, however, emphasised their view on creating capabilities for sustainable information sharing effort, especially in children services. Based on the empirical findings, it is clear that reaching a sustainable state in information sharing is a complex task since it requires strategic transforms towards the innovation. According to the AHP results, the two most important factors influencing this phase are collaboration culture and inter-departmental trust, which cannot be achieved over night. Moreover, the interviewees pointed out that the pressure from the community in terms of recommendations and complaints substantially influence this

phase.

Based on the interview discussions in LGA_NW and LGA_LON and the researcher's observation in LGA_SE, three new phases were acknowledged. Firstly, the interviewees point out that after the incentive phase when the departments gain the knowledge about why and how information should be shared, they go through a so-called "*Research Phase*" in which they examine the success or failure of previous IT projects. Thereafter, prior to signing up the formal information sharing protocol (i.e. proposal phase), the departments go through (a) discussion sessions over the terms and concepts to standardise their communication protocols or "*Discussion and Proof of Concepts*" and (b) examining the existence of relevant legislation or "*Legislation Framework Phase*". Therefore, the revised participation phases based on the empirical findings are summarised in Figure 6-2.

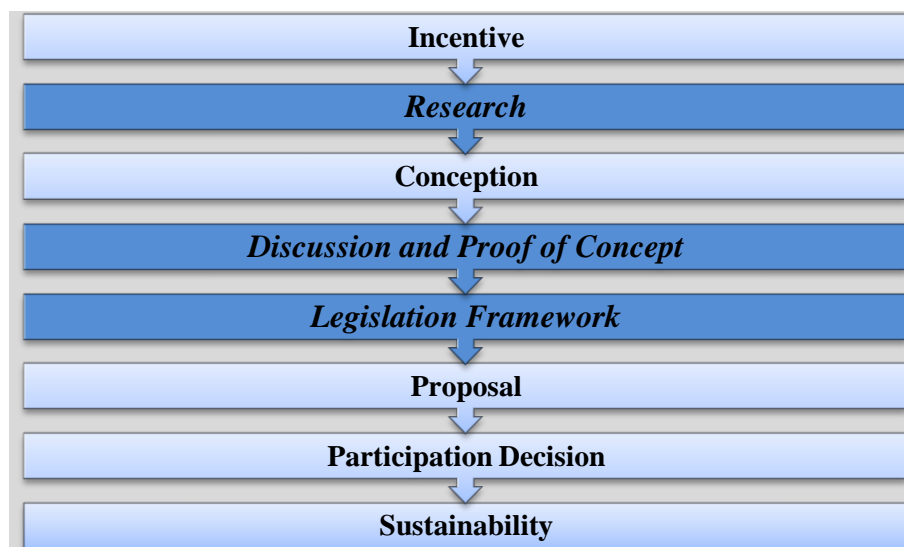


Figure 6-2: Revised Phases of EIS Participation in LGAs

Based on the above discussions on the factors and participation phases initially proposed and the new factors and phases identified through the empirical findings, the revised conceptual framework for EIS participation in LGAs is illustrated in Figure 6-3.

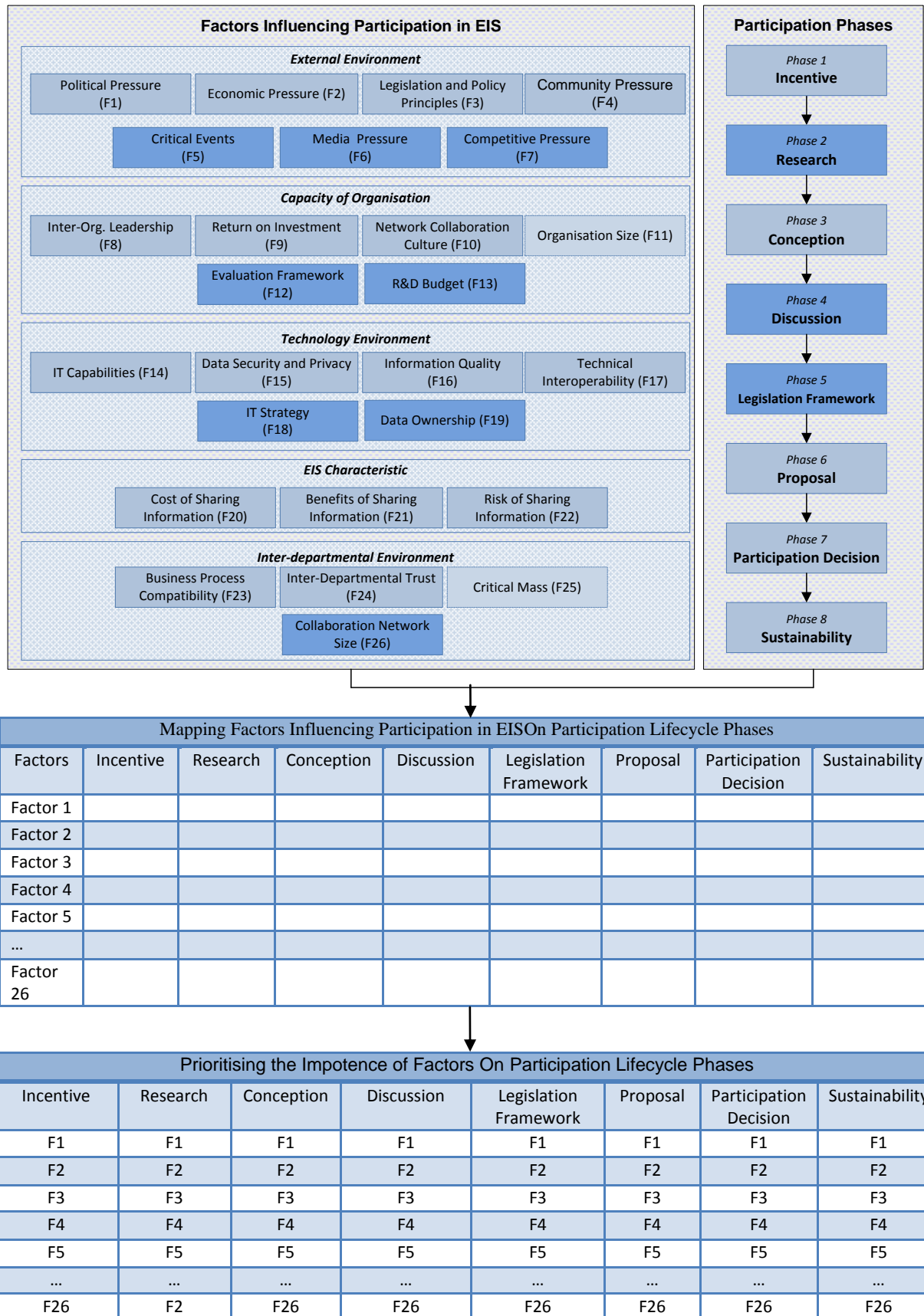


Figure 6-3: Revised Conceptual Framework for EIS Participation in LGAs

6.2 Conclusion

Based on the empirical findings presented in the previous Chapter, this Chapter discussed (a) the importance of each of the proposed factors that influence inter-departmental information sharing through IOSs, (b) which factors have been more influential in which phases of the participation effort and (c) how the final decision of the departments to participate in EIS initiatives have transformed the way to which the factors influence their decision. It was argued that applying Diffusion Innovation Theory as well as Technology-Organisation-Environment Framework is not sufficient to examine an adoption of inter-organisational innovation such as EIS. One of the main reasons is that these two organisational-level theories do not offer sufficient constructs to examine collective adoption behaviour. They are more applicable when the adoption of innovation in one focal firm sought to be examined. Therefore as the main intention of this thesis was to examine the participation of several entities in innovation adoption processes, the researcher suggested several other factors should be taken into account.

For instance, the effects of the collaboration network on the adoption decision were among those issues that previously were not considered in DOI and TOE studies. Therefore, Social Exchange Theory was found to be relevant in order to argue that when the adoption depends on the number of other users who adopt the same innovation, network effects should be taken into consideration. Therefore, several factors such as Inter-departmental Trust and Collaboration Culture were examined based on the empirical findings to understand the impacts of the network externalities. In the next Chapter's Contribution section, the weaknesses of DOI and TOE to examine the adoption of inter-organisational innovation adoption will be presented in-depth.

This Chapter, furthermore, focused on revising the EIS conceptual framework presented in Chapter 3. The modifications to the framework were imposed by the empirical findings discussed in Chapter 5, in which they suggest that apart from the factors and participation phases reported in the initial framework, new factors and phases should be considered when adopting IOSs to share personal information electronically. Three of the new factors that emerged were related to the External Environment (i.e., Critical Events, Media Pressure and Competition Pressure) and were cited in all three case studies. Another two factors identified through the empirical findings were related to the Organisational Capacity (i.e., Evaluation Framework and R&D Budget). In terms of the Technology Environment, the interviewees in

two of case studies emphasised IT Strategy and Data Ownership as two important factors that significantly influence their decision towards EIS participation. Lastly, in relation to the Inter-departmental Environment, the empirical findings suggest that Collaboration Network Size should be the main concern of the departments, rather than the size of LGAs.

In the case of the participation phases, the empirical findings revealed that although the departments pass through the proposed phases, there is no clear line between them. The plausible explanation is that the authorities have not prepared any formal procedure to clarify and tackle different phases of the adoption process. In addition to the initial proposed phases, three new phases were identified through the empirical findings; Research, Discussion and Proof of Concepts and Legislation Framework phases. It could be observed that, further to the proposed phases, just the discussion phase was carried out through the implementation and adoption of the integrated systems in LGAs and the interviewees emphasised the necessity of the research and legislation framework phases to be carried out.

Chapter 7 – Conclusion, Contributions, Limitations and Future Research

7.1 Research Overview

This thesis was motivated by the widespread impacts of adopting inter-organisational systems to improve the effort of information sharing in inter-departmental collaboration in local authorities and the hope that establishing such tools may enhance the quality of service delivery towards citizens, especially those who are at risk. It attempted to put together a theoretical background as a foundation and empirical data from three case studies in the UK to examine and analyse the effort of EIS and the way that the local authorities handle and manage personal information. The research aimed to explore the extent to which the integrated systems provide the foundation of inter-departmental collaboration and for achieving the best outcomes for citizens. Prior to presenting the research contributions, limitations and future directions, a summary of this thesis is presented as follows:

Chapter 1 presented the background to the research and explained the reasons why further investigation regarding information sharing in local authorities is required. The normative literature indicated that the dilemma over information sharing, especially when it comes to sensitive information, is a big challenge in local authorities. Since effective approach to managing personal information across the organisation brings several benefits, the LGAs across the country have started to implement and adopt inter-organisational systems as the foundation to the effort. However, the way in which LGAs implement and adopt these systems and the circumstances in which their departments participate in EIS have not been widely investigated; hence the research in this area is quite limited. Based on an extensive literature review on inter-organisational systems and information sharing in the public sector, it could be argued that previous studies (a) have not examined together technical and non-technical factors that influence the EIS effort at the local level and have been conducted when ICTs were not as advanced and developed as they are today, (b) have not broadly identified the phases in which the departments may go through prior to taking part in the effort, (c) did not prioritise the proposed factors based on their importance in each participation phases and (d) have mainly focused on analysing the experiences and viewpoints of those government agencies that first operate at a central or federal level and second are pioneers in using

technology and complex systems. Therefore, Chapter 1 stated the aim of the research as to “*Investigate and analyse the barriers and enablers of electronic information sharing among LGA departments in order to enhance and improve the quality of service delivery and achieve a more effective social outcome, without compromising fundamental rights of citizens such as privacy protection and confidentiality.*”

Chapter 2, in an attempt to address the research aim and objectives, started by describing the notion and concepts of information sharing in public sector organisations and proceeded to identifying several benefits and challenges that the effort may bring to the organisations. Previous studies on information sharing were briefly reviewed, focusing mainly on two conceptual frameworks by Dawes (1996) and Landsbergen and Wolken(2001). It was argued that these two frameworks have several limitations, including among others that they just examine only a few factors such as benefits and risks as the drivers of the effort, or that they have only been evaluated within organisations with high IT expertise; hence would not be suitable for LGAs that are not familiar with complex IT systems. The Chapter moved towards more recent literature and focused on examining four main contexts that influence the effort of EIS in the public sector; policy and social environment, inter-organisational settings, organisation/business process and technology solution.

Finally, the taxonomy of Markus and Robey (1988) was presented in order to identify the most suitable theory to study the adoption of EIS initiatives. It was argued that most of the previous studies on innovation adoption have used a factor approach relying on DOI theory and/or TOE framework. However, in order to study an inter-organisational innovation, in which several departments are involved in the processes of adoption, two major issues should be taken into account: (a) the unit of analysis has to be expanded beyond the departmental level and (b) the time scale requires to be extended beyond a single epoch. In order to further support the proposed conceptual framework (presented in Chapter 3), it was argued that *social exchange theory*(Emerson, 1976)and *critical mass theory*(Bouchard, 1993)can also provide an essential foundation for identifying some of the factors that influence inter-departmental EIS.

Chapter 3 focused on investigating the information sharing context presented in Chapter 2 more in-depth. Therefore, this Chapter proposed a conceptual framework for EIS participation in LGAs, consisting of four main levels: (a) factors influencing the effort of EIS

in LGAs, (b) the phases that each LGA department can experience to make decision about sharing information, (c) mapping the influential factors onto the participation phases and (d) prioritising the factors influencing EIS in LGAs in relation to different participation phases. Regarding the first level, the factors were categorised into five main categories chiefly based on the procedural framework on IOS adoption proposed by Kurnia and Johnston (2000): External Environment, Organisational Capacity, Technology Environment, EIS Characteristics and Inter-departmental Environment. As the main intention of the research was to examine the adoption of an innovation (EIS) in LGAs, the researcher mainly focused on reviewing previous literature on IOS adoption and information sharing specifically at the local level to identify the influential factors.

It was reported that none of the previous studies in IOS adoption or EIS in LGAs have attempted to investigate the phases that the departments adopt prior to taking part in the innovation adoption effort. Moreover, to the best of the researcher's knowledge, previous studies have not prioritised the factors influencing the EIS effort in relation to the different phases of participation. Therefore, it was argued that current literature can be improved by addressing these two gaps and in practice, the LGA departments may benefit from a detailed EIS decision-making process. Putting together all these four layers, the factors, participation phases, mapping and prioritisation, the conceptual framework for EIS participation in LGAs was proposed.

Chapter 4 outlined the research approach adopted in this thesis to address the aim and objectives of the study. Interpretive case study research was selected as the most suitable approach to examine the adoption of IOSs and the impacts of factors on the decision-making process for sharing information. It was reported that through an interpretive approach, understanding of the nature of different contexts influencing the effort of EIS would be improved. A multiple case study approach was found to be more appropriate as the objective of this research was to uncover different aspects of EIS in LGAs and the extent to which the proposed factors have similar or dissimilar impacts on the effort in each LGA. An overview of the three case studies was introduced together with a brief introduction to the projects implemented in each organisation. For the purpose of this research, semi-structured interviews were the main data collection technique. Moreover, as one of the main objectives of this research was the prioritisation of the proposed factors, several prioritisation techniques were examined and compared. As a result, AHP was preferred over others since other

techniques use quite complex mathematical models and the factors identified in this study were not quantifiable. Regarding the data analysis method, a pattern matching technique was deemed to be more appropriate since the conceptual framework for EIS participation in LGAs was first developed based on several theories and then the adequacy and appropriateness was tested and evaluated through the empirical findings, i.e. based on the interviews, observations and documentations.

Chapter 5 introduced the empirical data collected by conducting three case studies within the region of England and Wales. The main focus in all three cases – i.e. Home to School project in LGA_NW, Integrated Children System in LGA_SE and Integrated Waste Management System in LGA_LON – was to examine the implementation and adoption of integrated corporate systems in order to understand in what circumstances LGA departments share information with each other and how. The presentation of the empirical findings was categorised into two parts; (1) based on the information sharing context presented in Chapter 2, for a better understanding of the four broad contexts surrounding the effort of EIS and (2) based on the research propositions presented in Chapter 3, to examine and evaluate the EIS conceptual framework. The cases show how departments collaborate to first adopt the integrated systems and consequently share personal information between each other. As part of testing the EIS framework, the application of AHP demonstrated the importance of the factors influencing EIS in relation to the five phases.

Chapter 6, consequently, provided in-depth discussions about the individual factors and participation phases using the empirical findings presented in the previous Chapter. The main objectives of this Chapter were to (a) examine the extent to which the proposed factors and phases influence the adoption of IOSs and EIS within the LGA departments, (b) identifying which factor(s) are more influential in the phases of participation and (c) analyse how the final action of the departments may transform the capacity of the LGAs in order to participate in EIS. Although prioritisation of the factors illustrated that they do not influence the effort of EIS in LGAs equally, the empirical findings confirmed the validity of the proposed factors as well as EIS participation phases. Moreover, during the discussions with the interviewees, several new factors, previously not considered emerged such as critical event and media pressure. The Chapter also proved the hypothesis presented in Chapter 2, or that DOI and TOE on their own are not capable of explaining an inter-organisational initiative such as EIS. This will be discussed later on in this Chapter (Section 7.3.1). Putting together the validated

factors and phases as well as the additional ones identified through the empirical findings, the conceptual framework for EIS participation in LGAs was revised in this Chapter. The framework can be used as a decision-making tool by the LGAs prior to and during EIS.

Chapter 7, after presentation of the research overview, will discuss how the research objectives were addressed in this thesis. Moreover, it will present the contribution of this research to (a) theory – i.e., why DOI and TOE are not capable of explaining the adoption of IOS and how they can be transformed to be made applicable to this context, (b) research methodology – i.e. comparing the methodology used in this research with previous studies in information sharing in public sector and (c) IOS adoption and EIS practice – i.e., how local authorities can improve the quality of decision-making using the proposed conceptual framework.

7.2 Meeting the Objectives

To achieve the aim of this research, seven objectives were defined in Chapter 1. The accomplishment of these objectives are summarised in Table 7-1.

<i>Objectives</i>	<i>Chapters / Sections</i>
Objective 1	Chapter 1 and Chapter 2
Objective 2	Chapter 3 / Section 3.2
Objective 3	Chapter 3 / Section 3.3
Objective 4	Chapter 3 / Section 3.4, 3.5 and Chapter 4 / Section 4.4.2.1
Objective 5	Chapter 3 and Chapter 4
Objective 6	Chapter 5 and Chapter 6
Objective 7	Chapter 5, Chapter 6 and Chapter 7

Table 7-1: Accomplishment of the Objectives

Herein, it will be explained how each of the objectives was met in the thesis's Chapters:

***Objective 1** – Provide a concise review of the notion of inter-departmental information sharing in LGAs, as well as the way they implement and adopt IOS to share information in an electronic fashion.*

This objective was addressed in Chapter 1 and 2, where the importance of information sharing especially in local authorities was highlighted and followed by presenting previous studies and conceptual frameworks on information sharing in public sector organisations.

***Objective 2** – Critically investigate and examine the factors that influence the effort of EIS in the context of inter-departmental collaboration in LGAs.*

Based on the critical review of the previous framework on information sharing and relevant theories regarding adoption of IOSs, it was clarified that the absence of a conceptual framework to examine the effort of EIS in LGAs is evident. Therefore, based on the Kurnia and Johnston (2000) framework and the support of DOI and TOE, several factors were identified to be influencing the effort of EIS in LGAs.

Objective 3 – Critically investigate and examine the phases that departments adopt while participating in the EIS effort in LGAs.

This objective was met in Section 3.3 where after identifying the influential factors, it was reported that sharing information through IOSs can be considered as an innovation. Therefore, it was proposed that five phases should be taken into consideration prior and while sharing information electronically: (a) Incentive, (b) Conception (c) Proposal and Agreement (d) Participation Decision, (e) Sustainability.

Objective 4 – Demonstrate the importance of the influential factors in relation to the participation phases that can support the overall decision-making process for EIS in LGAs.

This was accomplished in Section 3.4 and 3.5 by arguing that none of the existing research on EIS in the public sector has ever investigated the mapping the influential factors onto different phases of participation. Moreover, it was claimed that prioritisation of factors may determine whether or not inter-departmental information sharing would have a constructive result(s). Different prioritisation methods were compared and examined in Section 4.4.2.1 and based on that, AHP method was preferred over others.

Objective 5 – Develop and present a conceptual framework for EIS participation in LGAs that holistically addresses previous objectives.

Following the presentation of the influential factors, participation phases, mapping and prioritisation of the factors, a conceptual framework for EIS participation in LGAs was proposed in Chapter 3. In order to evaluate the framework, suitable methodologies were

presented and examined in Chapter 4.

Objective 6 – Test and evaluate the proposed conceptual framework through analysing empirical data gathered from several case studies in the context of UK’s LGAs.

This objective was accomplished in Chapter 5 and 6 with presentation and discussion on three case studies in three LGAs across England and Wales. The cases were involved in personal information sharing in an inter-departmental collaboration via IOS. The description of each case and empirical findings were presented in Chapter 5 and in-depth discussions on how individual factors influence the EIS decision was highlighted in Chapter 6. Finally, a revised conceptual framework was proposed and reported that it may support the decision-making process.

Objective 7 – Provide a novel contribution to the domain of local authority, as well as develop implications for theory and practice and future research directions.

Drawing from the empirical findings presented in Chapter 5 and 6, contribution to theory, methodology and IOS adoption and EIS practice in LGAs are presented in Chapter 7.

7.3 Research Contributions

In research of this nature, it is inherently difficult to obtain measures of the quantity and quality of information sharing actually being done, how often information is not shared when it ought to be in inter-departmental collaboration and how far confidentiality and citizens’ privacy is or is not respect. Based on the findings and discussion, it can be reported that there is a lot to be learned in the field of information sharing in inter-departmental settings in public sector organisations. The effort of EIS through IOSs is increasingly becoming an inclusive phenomenon in LGAs.

During the last year or so, several LGAs in England and Wales have been issued with severe penalties due to data breaches among their departments and breaking the Data Protection Act. This clearly highlights that the authorities have not been able to successfully implement and adopt the inter-organisational systems in order to share sensitive and confidential information while protecting citizens’ privacy.

Therefore, this exploratory study attempts to contribute to the theoretical, methodological and practical aspects of the above debate. This was emphasised by developing and presenting a conceptual/theoretical framework and then evaluating it by applying it to three comprehensive case studies within the region of England and Wales. The integration between the theoretical concepts and the empirical data gathered through the case studies may assist those who seek to improve the quality of decision-making in EIS participation and innovation adoption in an inter-departmental setting.

7.3.1 Contributions to Theory

This study has several theoretical implications and contributes to the state of the knowledge in information management in public sector organisations. These contributions can be summarised as follows:

- The research presented in this thesis adds to the information sharing literature by identifying new issues influencing this effort in inter-departmental collaborations in local authorities. This was a result of conducting an extensive literature review on IOS adoption and inter-departmental EIS that illustrate the extent to which research in these fields is very limited especially in the context of LGAs.
- This study extended previous theoretical frameworks of information sharing in public sector (e.g., Landsbergen Jr and Wolken Jr, 2001; Dawes, 1996) by applying a “processual” perspective. This highlights that the capability of LGA departments willing to adopt a technological innovation as well as the nature of the innovation itself could be changed over time, while the adoption processes are in progress. Therefore, a reciprocal link between the action of the LGA departments (i.e., EIS participation) and the proposed factors that influence the effort was taken into account. This claim was subsequently evaluated in Chapter 6 where the researcher examined the extent to which the departments’ decision to share information altered the capacity of LGAs in terms of IOS adoption.
- By identifying and presenting the factors influencing EIS in inter-departmental collaboration in Chapter 3, it was claimed that DOI theory and TOE framework would not be sufficient to examine the adoption of an inter-organisational innovation such as EIS. It was reported that since the participation in EIS relies on the number of other users and

their administrative and technological capabilities, the network effect should be taken into consideration. Therefore, by adding the inter-departmental environment to the initial style of DOI and TOE-based framework, this section moves the research a step forward and analyses the context of individual departments and the interaction between them. This claim was later tested and justified with empirical findings in which the factors derived from the network effect such as Network Collaboration Culture and Inter-departmental Trust were among the highly ranked and highly influential factors. Moreover, it should be reported that the inter-departmental environment category should be considered as the most influential context for EIS effort since departments are directly able to improve the issues within this category compared to other categories.

- Another novel contribution of this research is the investigation and validation of the phases that each department adopts prior to or during information sharing. Five phases were proposed in Chapter 3 and it was reported that, in order to improve the quality of decision-making, the proposed influential factors should be analysed within each of these phases. The existence of the participation phases was validated through the empirical findings in Chapter 6 and pointed out that the LGA departments go through the four phases prior to participation in EIS to then reach the sustainability phase. Based on the empirical findings, three new phases emerged and were validated.

7.3.2 Contributions to Methodology

In terms of the methodological contribution, one of the main strengths of this thesis is that it presents and compares several techniques for prioritising the importance of factors influencing EIS. By selecting the AHP method as the most suitable technique in the context of this research, it can be claimed that the concept of prioritising the factors can be further applied to other cases across the UK and EU, in order to gain a better understanding of factors influencing EIS in local government. This is a novelty since most of the previous studies in information sharing in public sector have failed to rank the factors influencing the effort in order to ease off the decision-making processes.

This technique seems to perform better than results based purely on the experts' assignment of the absolute priorities of each factor or than results based just on qualitative analysis. Note also that, by using this technique, the importance of each factor is compared to others. It can

be argued that the fact of seeing factors relative to each other (i.e., making comparisons) seems to be an easier way to calibrate their importance. Furthermore, by using AHP, some inconsistencies may arise, giving place for reconsideration of judgements and unveiling some unclear thinking regarding the assessments of some of the factors.

It was also claimed that this technique has not traditionally been applied for the analysis of factors related to EIS in LGAs. The usage of AHP is not limited to the extent as applied and explained in this research; it can be applied to a wide range of decision-making problems with multi-attributes and alternatives. Although, the result may differ according to the viewpoint (since decisions are subjective by their nature) the mechanism of the technique is the same. In addition, the results do not mean that any factor is unimportant. It means what the interviewees' perceptions about the importance of them are. This is a main issue, since it is possible to manage the development process with more information about the expectations of final users. This research is focused on the users' point of view. Hence, the AHP method can be a useful technique since users' satisfaction may be more critical in EIS. The weights for different factors obtained by using the AHP technique can be subsequently used to prioritise the importance of EIS in LGAs.

7.3.3 Contributions to IOS Adoption and EIS Practice

Contribution to practice should not be translated to devising best practices or any form of guidelines for the LGAs. In this research, an urgent need was identified and proposed for improving information sharing in inter-departmental collaboration in local authorities, as they are the main source of citizens' information required for the delivery of public services. Based on the empirical findings of this research, the patchiness of local informationsharing practices highlight the fact that there is a high probability that some personal information is being shared in circumstances that may not warrant it, with costs both to personal privacy and to service outcomes.

Therefore, in addition to the theoretical and methodological contributions, this study has several practical contributions that could be important to the local authorities and the directors of the departments involved in inter-departmental initiatives. This research makes a significant contribution to the members of public who are the end-users of the services provided by the LGAs and always in fear of their personal and sensitive information being misused or shared with unauthorised affiliates. This was initially achieved through proposing

a novel conceptual framework which can be used as a tool to assist LGA departments on their decision to participate in an EIS effort. Validating the EIS framework through the three case organisations, uncovered several practical lessons for the adoption of IOSs as well as participating in inter-departmental information sharing.

In LGAs, information sharing decisions often are taken in the absence of formal decision rules, which put the participating parties in a continual dilemma between the risk of “false negative” errors – i.e. when no action is taken and turns out later that it should have been taken and the risk of “false positive” judgements – i.e., when action is taken, however, it turns out that the risk was lower than would justify it (Bellamy *et al.*, 2005). The conceptual framework presented in this thesis aims at reducing these dilemmas, by breaking down the phases of participation and identifying the most and least influential factor(s) in each phase. Moreover, participation in an inter-organisational initiative becomes more formal and step-by-step rather than a patchy process, which arguably reduces the risk of failure. This should be in the centre of attention by the departments’ managers and top officials in LGAs since in the current economic situation, investment in implementing and adopting IOSs and inter-departmental initiatives is far from easy and the authorities cannot afford any failure.

Another key practical contribution of this study is related to the participation phases, especially post-adoption or post-participation. All three case studies emphasised that the LGA departments do not have any formal plan to continuously keep-up with the effort of EIS after the adoption of the IOSs. Yet, after the implementation and adoption of the systems, the information sharing effort is still patchy and case-by-case. This study investigated and highlighted the importance of “sustainability” in EIS and argued that this phase should be considered as one of the most important phases of participation. Based on the empirical findings, one of the main reasons that the LGAs do not consider this stage is that creating capability for sustainable information sharing is a very lengthy and complex task since it relies on improving several fundamental issues. For instance, in all selected case studies, collaboration culture and inter-departmental trust were identified as the most important factors influencing the effort in the sustainability phase.

7.4 Recommendations: Improving EIS for Effective Social Outcomes

Based on an extensive literature review, the discussions on the case organisations’ findings and the feedback from academics and experts on the results, the following recommendations

for improving inter-departmental EIS in the context of the UK's LGAs can be proposed. It is clear that LGA officials are concerned about the need to protect personal information and are acting upon this. However, the case for organisational and technological transformation is strong and the laws and regulation to protect citizens' privacy lack clarity and responsiveness. While implementation and adoption of inter-organisational systems to share information electronically is in its early stages, it should not be expected that the traditional processes of information sharing (i.e., paper-based, face-to-face, etc.) will be transformed over-night. The recommendations are concerned in several areas summarised as follows:

- It can be recommended that an information sharing protocol that covers organisational, managerial and technological aspects of information sharing should be developed and put in place. This will improve the process of trust building among departments as it brings clarity in the departments' commitments towards EIS. Although several authorities in the UK have already published their "Inter-agency Information Sharing Protocol", they mainly focus on (a) the relationship between the LGA and other government agencies rather than the relationship among the departments within an authority itself and (b) organisational and legal aspects of information sharing and not on aspects of sharing through integrated and computerised systems.
- In all three cases, collaboration culture was identified as one of the most influential factors that require more attention. It is clear that organisational and technological changes in LGA departments have not gone hand in hand with a wider shift in cultural values. This specific recommendation concerns building a network collaboration culture to improve several issues such as accountability, transparency, inter-departmental trust and the way in which departments can authenticate entitlement to services using a minimum of confidential and personal information.
- There is confusion in the LGAs' senior management: Initially, it would be important to understand and distinguish between the terms collaboration, interoperability and integration. In order to establish an efficient public service delivery, organisational and technical performances of different units need to be interrelated. This requires collaboration and cooperation, pointing to common cross-departmental strategies and principles, as well as interoperability, pointing to the technical backbone that enables the

corporate systems to share information. Given these two enablers, integration is the result of both organisational cooperation and technical interoperability between departments and their partners.

- The case organisations clearly emphasised that the LGA departments have no formal procedures to select their IT suppliers. LGAs increasingly have to identify and manage IT suppliers, in order to identify “who is more reliable and accustomed to working with”. The empirical findings suggest that there is a need for senior officials to develop their knowledge and skills in this respect. They need to be aware of changes in the systems marketplace to ensure choosing the most appropriate and cost-effective IOS solution.
- Cost, benefit and risk analysis regarding the implementation and adoption of IOSs among LGA departments is very poor. Costs – regarding time and effort, benefits – regarding improved collaboration and access to timely and accurate information and risks – regarding losing sensitive information and receiving penalties are unevenly distributed among the participating departments. Therefore, these analyses should be carried out mutually with the presence of senior staff from each of the departments willing to share information.

7.5 Research Limitations

This study, such as any research endeavour, is limited in certain respects. These limitations should be taken into account while interpreting the findings and results. Firstly, evaluating interpretive case study research is very subjective despite the existence of the basic principle discussed in Chapter 4. Several principles, from the ones that Klein and Myers(1999) proposed, were embedded in this thesis in order to make the understanding, interpretation and evaluation of the results straightforward. The principle of contextualisation was facilitated in each case study by critically reflecting the background of the LGA, background to the IT infrastructure and motivations for implementing and adopting an EIS effort. This could help the potential readers to see how the need for an extensive inter-departmental EIS emerged in the context of local authorities. The principle of abstraction and generalisation was facilitated through guiding a socio-technical framework developed upon several concepts and theories that assisted to link the theoretical background with empirical data collected through the case organisations. The principle of multiple interpretations was also assisted by interviewing four

senior managers in the departments involved in the EIS effort to obtain their understandings of the IOSs and realise how they reflect their own interest and the departments they manage.

Secondly, the research presented in this thesis is limited by the common shortcomings of case study research. The specific context of the local authorities limits the generalisation of the results. One reason of this limitation is because of the organisational structure of LGAs in the UK. There are five different types of local authorities in the UK, which are divided into single-tier and two-tier authorities with differences in structure, nature and size. Furthermore, the number of local authorities in the UK that have adopted and implemented IOSs to share information electronically is very few. Therefore, generalising the findings and results of this research to other parts of the UK would be difficult. By selecting three different types of local authorities in this study, the intention was to cover a wide range of authorities serving citizens in the UK.

Another major limitation of this study was the number of interviewees. It was attempted to interview more than four people in each case organisation, but this request was rejected by the senior officials in the selected LGAs. One of the possible reasons was that the LGAs were not comfortable to let the researcher interviews both senior and junior staff on the same subject. Moreover, as the interviewees were from different departments with different ways of handling information and using computerised systems, there was a large degree of bias towards the adoption of the IOSs and EIS effort. This made the interpretation of the data difficult. To address this issue, evidence of empirical findings were presented through inclusion of supporting quotes from the interviewees.

Despite these potential limitations, the empirical findings enabled the researcher to gain insights into the way in which LGA departments manage and share information electronically between each other. In the next section some recommendations regarding the future research will be proposed.

7.6 Future Research Directions

Adoption of inter-organisational systems in order to electronically share personal information is a fairly new topic in the context of the public sector in general and local governments specifically. Although the research presented in this thesis comprehensively identified and analysed the factors that influence the effort of EIS in LGAs, many of them can be explored

more in-depth thorough individual studies. Therefore, there are still many areas that need to be investigated and future study should expand the understanding of IOS adoption and EIS effort beyond the scope of the present research. Some directions for the future studies are recommended as follows:

- In this study, it was argued that the organisational structure, business processes and functions and capability and resources of LGAs across the country are not similar. This was one of the main reasons that the results of this study could not be generalised for the context of England and Wales. Therefore, future studies can focus on evaluating the proposed conceptual framework (Figure 3.6) in the context of different cities and counties across the country. This may assist to compare the experiences of other LGAs so some comprehensive guidelines can be proposed to improve the EIS effort in inter-departmental collaboration.
- Theoretical synthesis may extend and enrich the EIS conceptual framework. In this research, the proposed framework derived from a procedural view towards IOS adoption, and factors were identified based on the DOI and TOE framework. It was discussed that the participation in an EIS effort relies on collaboration among several entities. Therefore, two more theories were reported as appropriate for the evaluation of the inter-departmental trust and power (Social Exchange Theory) and the network effects (Critical Mass Theory). Yet another root for theoretical development can be recommended as to explore the influences of individual behaviour and individual adoption of EIS participation in LGAs. Future studies can investigate that, apart from the influences of environmental, organisational and technological contexts, how individual factors such as education or job tenure may influence inter-organisational innovation adoption.
- Future studies can also investigate the external validity of the EIS conceptual framework by incorporating cases from outside the UK with different national, cultural and organisational settings. Also, although the conceptual framework developed in this study was based on prior findings from developed and western countries, it would be interesting to evaluate it through cases from the developing countries and compare the empirical findings.
- Throughout this research several factors and participation phases were identified by the

interviewees, which shaped the revised version of the EIS conceptual framework. Therefore, future studies can validate the revised EIS participation phases and conduct the AHP-based evaluation of the revised factors.

- Finally, the last interesting recommendation for future research concerns the examination of the strategic, operational and social impacts that the adoption of IOSs and inter-departmental EIS may bring to an organisation. This is one of the key issues reported by Robey et al. (2008) that require further research. Strategic impacts refer to the effects of EIS on the mission and scope of the organisation, operational impacts refer to more efficient and effective operations and social impacts refer to changes in the entire adopting organisation and in the inter-departmental relationships.

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Appendix A: Interview Agenda

Inter-departmental Electronic Information Sharing in Local Government Authorities

Section A: General Interview Information

A.1 Interviewee's Details

Forename	
Surname	
Telephone Number	
Email Address	

A.2 Interviewee's Age Group:

- 18 – 25
 26 – 35
 36 – 45
 46 – 55
 56 – 65
 Over 65

A.4 Interviewee's Gender:

Male

Female

A.5 Interviewee's Highest Level of Education

- Bachelor's Master's PhD other: _____

A.6 Interviewee's Position: _____

Section B: Local Authority Background

B.1 What's the type of your authority?

- County Council
 District Council
 Metropolitan Council
 Shire OR Unitary Council
 London Borough

B.2 What is the population in your community? (Approximately)

- Less than 100,000
 100,000 – 500,000
 500,000 – 1,000,000
 More than 1,000,000

B.3 Approximately, How many employees work in your organisation?

- Less than 250 employees
 250 – 1000 employees
 1000 – 5000 employees
 More than 5000 employees

B.4 To what extent are the following types of communication used by your LGA to share information internally among different departments?

	No Usage	Low Usage	Moderate Usage	High Usage	Very High Usage
Paper	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Telephone / Fax	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Email	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
LGA's Intranet	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Integrate Information Systems	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				

Section C: Factors Influencing Electronic Information Sharing in LGAs

C1: External Environment

C.1.1 Politics Pressure: In your view, has the encouragement or pressure from the Central Government influenced your decision on establishing Electronic Information Integration and Sharing within your organisation?

C.1.2 Economic Pressure: Have you received any kind of financial aid from the Central Government? Have the spending cuts (7% cut for local councils from April next year) influenced your decision on establishing Electronic Information Integration and Sharing among your organisation? How?

C.1.3 Legislation and Policy Principles: Has the legislation set by the Central Government regarding using ICT in the public sector influenced your participation in Electronic Information Sharing?

C.1.4 Community Pressure: Has the pressure from the public and citizens live in your borough influenced your decisions on whether or not to share information with other department?

C.1.5 Other External Factors: What other external factors have you faced while participating in Electronic Information Sharing with other departments?

External Factors	More Important	Moderate	Less Important
Political Pressure			
Economic Pressure			
Legislation and Policy Principles			
Community Pressure			
Other External Factor:			
Other External Factor:			
Other External Factor:			

C2: Capacity of Organisation

C.2.1 Inter-Organisational Leadership: In your perspective, has managerial capability (where he/she has to control the collaboration among different departments), as a factor, influenced your participation on Electronic Information Sharing? What is the attitude of your manager(s) toward the deployment of such information technologies? What about the attitudes of the employees?

C.2.2 Return on Investment: In your view, has the financial capability of your organisation affected the decision on participating in Electronic Information Sharing? Have you examined the ROI regarding IOS projects in your organisation? How?

C.2.3 Networked Collaboration Culture: In general, how do you describe the relationship among the departments? Do you see that the culture of organisation is going to change throughout the collaborations?

C.2.4 Organisation Size: Do you think the size of your organisation can influence your decision on EIS? Is it because of the number of IS systems to be integrated? OR is it because of the number of employees to be collaborated?

C.2.5 Other Organisational Factors: What other organisational factors have you faced while participating in Electronic Information Sharing with other departments?

Organisational Factors	More Important	Moderate	Less Important
Inter-organisational Leadership /Management Capability			
ROI/ Financial Matter			
Network Collaboration Culture			
Organisational Size			
Other Inter-organisational Factor:			
Other Inter-organisational Factor:			
Other Inter-organisational Factor:			

C3: Technology Environment

C.3.1 IT Capability: what percentages of your department operations are computerised? Are your employees computer literate? Is the infrastructure suitable for such effort? Have you been required to transform your existing information systems to be able to participate in Electronic Information Sharing with other departments?

C.3.2 Data Security and Privacy: Does data security and privacy as a factor influence your participation in Electronic Information Sharing with other departments? How do you ensure the citizens that you are sharing their information in a secured way?

C.3.3 Information Quality: Do you think data quality can be considered as a vital factor influencing Electronic Information Sharing? Dose the current information has the quality to be shared across IOS? Please explain.

C.3.4 Interoperability Framework: Are the current information systems used in your department interoperable? Have you been required to define any data standard to be able to participate in Electronic Information Sharing with other departments?

Technological Factors	More Important	Moderate	Less Important
IT Capability			
Data Security and Privacy			
Information Quality			
Technical Interoperability / Data Standard			
Other Technological Factor:			
Other Technological Factor:			
Other Technological Factor:			

C4: EIS Characteristics

C.4.1 Benefits: What are the benefits for your organisation (OR department) to participate in this initiative? Relevant literature specified that Electronic Information Integration and Sharing bring a number of benefits to the organisation. The following table summarises these benefits.

Benefits	More Important	Moderate	Less Important
Reduce the overall costs of the organisation			
Reduce intra- and inter-agency paperwork/paper flow			
Reduce duplicate data collection, processing and storage			
Improve productivity			
Improve information accuracy			
Improve information accessibility			
Improve data quality			
Improve information timeliness			
Improve decision- and policy-making			
Improve intra- and inter-agency integration of computer systems			
Improve collaboration among different department			
Improve accountability (public image/reputation)			
Improve the organisation's business process			

C.4.2 Other Benefits: What other benefits do you think your organisation can gain through participating in Electronic Information sharing?

Benefits	More Important	Moderate	Less Important
Other benefits:			
Other benefits:			
Other benefits:			
Other benefits:			

C.4.3 Risk: What are the risks for your department to participate in this initiative? Relevant literature indicates that there are certain risks of Electronic Information Sharing among different departments as it is shown in the following table. Please highlight which of these risks your organisation faced.

Risk	More Important	Moderate	Less Important
Accessibility of information by other department			
Misinterpretation and misuse of the shared information			
Increase criticisms by other LGAs/departments and citizens			
Increase the maintenance cost of the existing information systems			
Reducing full control over information			

C.4.4 Other Risk: Do you think you faced any other risks regarding participating in Electronic Information Sharing?

Risk	More Important	Moderate	Less Important
Other Risk:			
Other Risk:			
Other Risk:			
Other Risk:			

C.4.5 Cost: What costs do you think you faced regarding participating in Electronic Information Sharing within your organisation?

Costs	More Important	Moderate	Less Important
Purchasing new/relevant hardware and software			
Cost of migrating from the old systems to the new ones			
Training and set-up costs			
Cost of maintenance (in order to be sustained in the effort)			

C.4.6 Other Costs: What other Costs do you think you may face while participating in Electronic Information Sharing?

Costs	More Important	Moderate	Less Important
Other Costs:			
Other Costs:			
Other Costs:			
Other Costs:			

C5: Inter-departmental Environment

C.5.1 Business Process Compatibility: Have you been forced to change your business process to participate in Electronic Information Sharing with other departments? How?

C.5.2. Inter-departmental Trust: Do you think trust is a vital factor regarding this relationship which would affect the participation in Electronic Information Sharing? Do your employees trust each other in order to share information?

C.5.3 Critical Mass: Were you knowledgeable about other departments or LGAs participating in this initiative? Did it influence your decision on participating in Electronic Information Sharing?

C.5.4 To what extent do you agree/disagree with the following statement? *“Electronic Information Sharing requires a transformation not just in the technical aspect of the information systems which are in used in an organization, but also change in decision making policies and in mind-set of the employees. Therefore, changes in processes and functions and the new way of management, especially in public sector, should be considered as a key issue.”*

C.5.5 Other Inter-departmental Factors: What other inter-departmental factors do you think you may face while participating in Electronic Information Sharing?

Inter-departmental Factors	More Important	Moderate	Less Important
Business Process Compatibility			
Inter-departmental Trust			
Critical Mass			
Other Inter-departmental Factor:			
Other Inter-departmental Factor:			
Other Inter-departmental Factor:			

C6: Closing Questions

C.6.1 In your opinion, what incentives are necessary to increase the level of local authority participation in this initiative?

C.6.2 In your opinion, what are the most important factors for successful electronic information sharing initiatives between state and local authorities in general?

C.6.3 Is there anything that you would like to add? Is there anything that I should have asked you about this issue, but I didn't ask?

C.6.4 If you know some other people who may be knowledgeable about these issues in other LGAs, could you please provide me their contact information?

Section D: Electronic Information Sharing Lifecycle Phases

D.1 Relevant literature indicates that there are five major lifecycle phases that each department is passing through in order to decide whether or not to share information. These phases are summarised as:

Phase	Comment
Incentive	
Conception	
Proposal	
Participation Decision	
Sustainability	

D.2 Can you think of any other phases which you come across while deciding whether to participate? Please explain.

Section E: Mapping and Prioritising the Importance of the Factors Influencing EIS based on Lifecycle Phases

E.1 Horizontally, the following table indicates the participation lifecycle phases and vertically, the factors influencing EIS. Please can you map which factor(s) you believe affected the electronic sharing in which phase in your LGA?

		Factors Influencing Participation in EIS	Incentive	Conception	Proposal	Participation Decision	Sustainability
EE		Political Pressure					
		Economic Pressure					
		Legislation and Policy					
		Community Pressure					
CO		Inter-Org. Leadership					
		Return on Investment					
		Collaboration Culture					
		Organisational Size					
TE		IT Compatibility					
		Data Security & Privacy					
		Information Quality					
		Tech. Interoperability					
EIS		Cost of EIS					
		Benefit of EIS					
		Risk of EIS					
IDE		Business Process Com.					
		Inter-departmental Trust					
		Critical Mass					

Can you please rank them based on the following scales?

Pair-wise Comparison scale for AHP Preferences	
Numerical Rating	Verbal Judgments of Preferences
1	A is equally preferred over B
2	A is equally to moderately preferred over B
3	A is moderately preferred over B
4	A is moderately to strongly preferred over B
5	A is strongly preferred over B
6	A is strongly to very strongly preferred over B
7	A is very strongly preferred over B
8	A is strongly to very extremely preferred over B
9	A is extremely preferred over B

External Factors	Political Pressure	Economic Pressure	Legislation and Policy	Community Pressure
Political Pressure	1			
Economic Pressure		1		
Legislation and Policy			1	
Community Pressure				1

Organisational Factor	Inter-Org. Leadership	Return on Investment	Collaboration Culture	Attitude
Inter-Org. Leadership	1			
Return on Investment		1		
Collaboration Culture			1	
Organisational Size				1

Technological Factor	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability
IT Compatibility	1			
Data Security & Privacy		1		
Information Quality			1	
Tech. Interoperability				1

Electronic Information Characteristic	Benefits	Risk	Cost
Benefits	1		
Risk		1	
Cost			1

Inter-departmental Factors	Business Process Com.	Inter-departmental Trust	Critical Mass
Business Process Com.	1		
Inter-departmental Trust		1	
Critical Mass			1

Appendix B: Empirical Calculations

Appendix B presents the empirical calculations for Steps 2 and 3 of the Sections 5.2.6, 5.3.6 and 5.4.6.

		EE			CO		TE		EIS			IDE	
		Political Pressure	Economic Pressure	Legislation and Policy	Return on Investment	Collaboration Culture	IT Compatibility	Data Security & Privacy	Cost of EIS	Benefit of EIS	Risk of EIS	Inter-departmental Trust	Critical Mass
EE	Political Pressure	1	3	5	0	0	0	0	0	0	0	0	0
	Economic Pressure	1/3	1	4	0	0	0	0	0	0	0	0	0
	Legislation and Policy	1/5	1/4	1	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/6	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	6	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	1	4	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	1/4	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	1	1	1/4	0	0
	Benefit of EIS	0	0	0	0	0	0	0	1	1	1/4	0	0
	Risk of EIS	0	0	0	0	0	0	0	4	4	1	0	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1	6
	Critical Mass	0	0	0	0	0	0	0	0	0	0	1/6	1

Pairwise Numerical Ranking of Factors on Incentive Phase by HIT in LGA_NW (Step 2)

		EE			CO		TE		EIS			IDE		Local Weight
Factors		PP	EP	L&P	ROI	CC	ITC	DS&P	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.5882	0.6792	0.4878	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5850
	EP	0.1960	0.2264	0.3902	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2709
	L&P	0.1176	0.0566	0.9752	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3831
CO	ROI	0.0000	0.0000	0.0000	0.1086	0.1063	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1074
	CC	0.0000	0.0000	0.0000	0.6521	0.6383	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6452
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.4444	0.4848	0.0000	0.0000	0.0000	0.0000	0.0000	0.4646
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.1111	0.1212	0.0000	0.0000	0.0000	0.0000	0.0000	0.1161
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666	0.1666	0.1666	0.0000	0.0000	0.1666
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666	0.1666	0.1666	0.0000	0.0000	0.1666
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6666	0.6666	0.6666	0.0000	0.0000	0.6666
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6000	0.5000	0.5500
	CM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.8333	0.9166

Normalised Numerical Ranking of Factors on Incentive Phase by HIT in LGA_NW (Step 3)

		EE			CO		TE		EIS			IDE	
Factors		Political Pressure	Economic Pressure	Legislation and Policy	Return on Investment	Collaboration Culture	IT Compatibility	Data Security & Privacy	Cost of EIS	Benefit of EIS	Risk of EIS	Inter-departmental Trust	Critical Mass
EE	Political Pressure	1	4	3	0	0	0	0	0	0	0	0	0
	Economic Pressure	1/4	1	3	0	0	0	0	0	0	0	0	0
	Legislation and Policy	1/3	1/3	1	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/4	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	4	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	1	1/2	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	2	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	1	2	1/3	0	0
	Benefit of EIS	0	0	0	0	0	0	0	1/2	1	1/4	0	0
	Risk of EIS	0	0	0	0	0	0	0	3	4	1	0	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1	4
	Critical Mass	0	0	0	0	0	0	0	0	0	0	1/4	1

Pairwise Numerical Ranking of Factors on Incentive Phase by ISM in LGA_NW (Step 2)

		EE			CO		TE		EIS			IDE		Local Weight
Factors		PP	EP	L&P	ROI	CC	ITC	DS&P	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.5454	0.7228	0.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5561
	EP	0.1363	0.1807	0.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2390
	L&P	0.1818	0.0602	0.1333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1251
CO	ROI	0.0000	0.0000	0.0000	0.1363	0.1401	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1382
	CC	0.0000	0.0000	0.0000	0.5454	0.5607	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5530
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.2222	0.2143	0.0000	0.0000	0.0000	0.0000	0.0000	0.2182
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.4444	0.4285	0.0000	0.0000	0.0000	0.0000	0.0000	0.4364
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2222	0.2857	0.2105	0.0000	0.0000	0.1796
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1111	0.1428	0.1578	0.0000	0.0000	0.1029
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6666	0.5714	0.6315	0.0000	0.0000	0.6231
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6315	0.5000	0.5657
	CM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1578	0.1250	0.1414

Normalised Numerical Ranking of Factors on Incentive Phase by ISM in LGA_NW (Step 3)

		EE			CO		TE		EIS			IDE	
Factors		Political Pressure	Economic Pressure	Legislation and Policy	Return on Investment	Collaboration Culture	IT Compatibility	Data Security & Privacy	Cost of EIS	Benefit of EIS	Risk of EIS	Inter-departmental Trust	Critical Mass
EE	Political Pressure	1	1	1/3	0	0	0	0	0	0	0	0	0
	Economic Pressure	1	1	2	0	0	0	0	0	0	0	0	0
	Legislation and Policy	3	1/2	1	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/4	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	4	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	1	2	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	1/2	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	1	1	1/3	0	0
	Benefit of EIS	0	0	0	0	0	0	0	1	1	3	0	0
	Risk of EIS	0	0	0	0	0	0	0	3	1/3	1	0	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1	5
	Critical Mass	0	0	0	0	0	0	0	0	0	0	1/5	1

Pairwise Numerical Ranking of Factors on Incentive Phase by PTL in LGA_NW (Step 2)

		EE			CO		TE		EIS			IDE		Local Weight
Factors		PP	EP	L&P	ROI	CC	ITC	DS&P	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.1905	0.3636	0.0943	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2161
	EP	0.1905	0.3636	0.5660	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3734
	L&P	0.5714	0.1818	0.2830	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3454
CO	ROI	0.0000	0.0000	0.0000	0.2205	0.1034	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1619
	CC	0.0000	0.0000	0.0000	0.8823	0.4138	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6480
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.3529	0.5714	0.0000	0.0000	0.0000	0.0000	0.0000	0.4621
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.1764	0.2857	0.0000	0.0000	0.0000	0.0000	0.0000	0.2310
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.4285	0.0769	0.0000	0.0000	0.2351
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.4285	0.6923	0.0000	0.0000	0.4402
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6000	0.1428	0.2307	0.0000	0.0000	0.9735
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3125	0.5000	0.4062
	CM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0625	0.1000	0.0812

Normalised Numerical Ranking of Factors on Incentive Phase by ISM in LGA_NW (Step 3)

		EE			CO		TE		EIS			IDE	
		Political Pressure	Economic Pressure	Legislation and Policy	Return on Investment	Collaboration Culture	IT Compatibility	Data Security & Privacy	Cost of EIS	Benefit of EIS	Risk of EIS	Inter-departmental Trust	Critical Mass
EE	Political Pressure	1	1	3	0	0	0	0	0	0	0	0	0
	Economic Pressure	1	1	4	0	0	0	0	0	0	0	0	0
	Legislation and Policy	1/3	1/4	1	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/2	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	2	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	1	3	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	1/3	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	1	2	1/4	0	0
	Benefit of EIS	0	0	0	0	0	0	0	1/2	1	1/3	0	0
	Risk of EIS	0	0	0	0	0	0	0	4	3	1	0	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1	4
	Critical Mass	0	0	0	0	0	0	0	0	0	0	1/4	1

Pairwise Numerical Ranking of Factors on Incentive Phase by PM in LGA_NW (Step 2)

		EE			CO		TE		EIS			IDE		Local Weight
Factors		PP	EP	L&P	ROI	CC	ITC	DS&P	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.3871	0.4000	0.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3624
	EP	0.3871	0.4000	0.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3957
	L&P	0.1290	0.1000	0.1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1097
CO	ROI	0.0000	0.0000	0.0000	0.2790	0.2564	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2677
	CC	0.0000	0.0000	0.0000	0.5581	0.5128	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5354
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.3529	0.6617	0.0000	0.0000	0.0000	0.0000	0.0000	0.5073
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.1176	0.2205	0.0000	0.0000	0.0000	0.0000	0.0000	0.1690
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1818	0.3333	0.1578	0.0000	0.0000	0.2243
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0909	0.1666	0.2105	0.0000	0.0000	0.1560
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7272	0.5000	0.6315	0.0000	0.0000	0.6195
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6315	0.5000	0.5657
	CM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1578	0.1250	0.1414

Normalised Numerical Ranking of Factors on Incentive Phase by ISM in LGA_NW (Step 3)

		EE		CO		TE				EIS		IDE
		Economic Pressure	Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Cost of EIS	Risk of EIS	Inter-departmental Trust
EE	Economic Pressure	1	1/3	0	0	0	0	0	0	0	0	0
	Legislation and Policy	3	1	0	0	0	0	0	0	0	0	0
CO	Inter-Org. Leadership	0	0	1	3	0	0	0	0	0	0	0
	Collaboration Culture	0	0	1/3	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	1	3	1/4	3	0	0	0
	Data Security & Privacy	0	0	0	0	1/3	1	2	4	0	0	0
	Information Quality	0	0	0	0	4	1/2	1	5	0	0	0
	Tech. Interoperability	0	0	0	0	1/3	1/4	1/5	1	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	1	1/4	0
	Risk of EIS	0	0	0	0	0	0	0	0	4	1	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1

Pairwise Numerical Ranking of Factors on Conception Phase by HIT in LGA_NW (Step 2)

		EE		CO		TE				EIS		IDE	Local Weight
Factors		EP	L&P	IOL	CC	ITC	DS&P	IQ	TI	CEIS	REIS	IDT	
EE	EP	0.2500	0.2499	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
	L&P	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
CO	IOL	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	CC	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.1765	0.6315	0.0724	0.2307	0.0000	0.0000	0.0000	0.2777
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0588	0.2105	0.5797	0.3076	0.0000	0.0000	0.0000	0.2891
	IQ	0.0000	0.0000	0.0000	0.0000	0.7058	0.1052	0.2898	0.3846	0.0000	0.0000	0.0000	0.3713
	TI	0.0000	0.0000	0.0000	0.0000	0.0588	0.0526	0.0579	0.769	0.0000	0.0000	0.0000	0.2345
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.0000	0.2000
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.0000	0.8000
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000

Normalised Numerical Ranking of Factors on Conception Phase by HIT in LGA_NW (Step 3)

		EE		CO		TE				EIS		IDE
		Economic Pressure	Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Cost of EIS	Risk of EIS	Inter-departmental Trust
EE	Economic Pressure	1	5	0	0	0	0	0	0	0	0	0
	Legislation and Policy	1/5	1	0	0	0	0	0	0	0	0	0
CO	Inter-Org. Leadership	0	0	1	1/2	0	0	0	0	0	0	0
	Collaboration Culture	0	0	2	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	1	4	3	4	0	0	0
	Data Security & Privacy	0	0	0	0	1/4	1	1	5	0	0	0
	Information Quality	0	0	0	0	1/3	1	1	4	0	0	0
	Tech. Interoperability	0	0	0	0	1/4	1/5	1/4	1	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	1	1/4	0
	Risk of EIS	0	0	0	0	0	0	0	0	4	1	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1

Pairwise Numerical Ranking of Factors on Conception Phase by ISM in LGA_NW (Step 2)

		EE		CO		TE				EIS		IDE	Local Weight
Factors		EP	L&P	IOL	CC	ITC	DS&P	IQ	TI	CEIS	REIS	IDT	
EE	EP	0.8333	0.8333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8333
	L&P	0.1666	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666
CO	IOL	0.0000	0.0000	0.3333	0.3333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3333
	CC	0.0000	0.0000	0.6666	0.6666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6666
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.5882	0.6451	0.7058	0.2857	0.0000	0.0000	0.0000	0.5562
	DS&P	0.0000	0.0000	0.0000	0.0000	0.1470	0.1612	0.2352	0.3571	0.0000	0.0000	0.0000	0.2251
	IQ	0.0000	0.0000	0.0000	0.0000	0.1176	0.1612	0.2352	0.2857	0.0000	0.0000	0.0000	0.1999
	TI	0.0000	0.0000	0.0000	0.0000	0.1470	0.0322	0.0588	0.0714	0.0000	0.0000	0.0000	0.0773
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.0000	0.2000
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.0000	0.8000
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000

Normalised Numerical Ranking of Factors on Conception Phase by ISM in LGA_NW (Step 3)

		EE		CO		TE				EIS		IDE
		Economic Pressure	Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Cost of EIS	Risk of EIS	Inter-departmental Trust
EE	Economic Pressure	1	1/5	0	0	0	0	0	0	0	0	0
	Legislation and Policy	5	1	0	0	0	0	0	0	0	0	0
CO	Inter-Org. Leadership	0	0	1	3	0	0	0	0	0	0	0
	Collaboration Culture	0	0	1/3	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	1	1/5	2	3	0	0	0
	Data Security & Privacy	0	0	0	0	5	1	4	5	0	0	0
	Information Quality	0	0	0	0	1/2	1/4	1	5	0	0	0
	Tech. Interoperability	0	0	0	0	1/3	1/5	1/5	1	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	1	1/4	0
	Risk of EIS	0	0	0	0	0	0	0	0	4	1	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1

Pairwise Numerical Ranking of Factors on Conception Phase by PTL in LGA_NW (Step 2)

		EE		CO		TE				EIS		IDE	Local Weight
Factors		EP	L&P	IOL	CC	ITC	DS&P	IQ	TI	CEIS	REIS	IDT	
EE	EP	0.1666	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666
	L&P	0.8333	0.8333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8333
CO	IOL	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	CC	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.1463	0.1212	0.2777	0.2307	0.0000	0.0000	0.0000	0.1939
	DS&P	0.0000	0.0000	0.0000	0.0000	0.7317	0.6060	0.5555	0.3846	0.0000	0.0000	0.0000	0.5694
	IQ	0.0000	0.0000	0.0000	0.0000	0.0731	0.1515	0.3703	0.3846	0.0000	0.0000	0.0000	0.2448
EIS	TI	0.0000	0.0000	0.0000	0.0000	0.0487	0.1212	0.0277	0.0769	0.0000	0.0000	0.0000	0.0686
	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.0000	0.2000
IDE	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.0000	0.8000
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000

Normalised Numerical Ranking of Factors on Conception Phase by PTL in LGA_NW (Step 3)

		EE		CO		TE				EIS		IDE
		Economic Pressure	Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Cost of EIS	Risk of EIS	Inter-departmental Trust
EE	Economic Pressure	1	1/4	0	0	0	0	0	0	0	0	0
	Legislation and Policy	4	1	0	0	0	0	0	0	0	0	0
CO	Inter-Org. Leadership	0	0	1	3	0	0	0	0	0	0	0
	Collaboration Culture	0	0	1/3	1	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	1	4	2	3	0	0	0
	Data Security & Privacy	0	0	0	0	1/4	1	4	5	0	0	0
	Information Quality	0	0	0	0	1/2	1/4	1	5	0	0	0
	Tech. Interoperability	0	0	0	0	1/3	1/5	1/5	1	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	1	1/3	0
	Risk of EIS	0	0	0	0	0	0	0	0	3	1	0
IDE	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1

Pairwise Numerical Ranking of Factors on Conception Phase by PM in LGA_NW (Step 2)

		EE		CO		TE				EIS		IDE	Local Weight
Factors		EP	L&P	IOL	CC	ITC	DS&P	IQ	TI	CEIS	REIS	IDT	
EE	EP	0.2000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000
	L&P	0.8000	0.8000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000
CO	IOL	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	CC	0.0000	0.0000	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.4800	0.7339	0.2758	0.2142	0.0000	0.0000	0.0000	0.4259
	DS&P	0.0000	0.0000	0.0000	0.0000	0.1834	0.0458	0.5517	0.3571	0.0000	0.0000	0.0000	0.2845
	IQ	0.0000	0.0000	0.0000	0.0000	0.2400	0.0458	0.1379	0.3571	0.0000	0.0000	0.0000	0.1952
	TI	0.0000	0.0000	0.0000	0.0000	0.1599	0.0366	0.0344	0.0714	0.0000	0.0000	0.0000	0.0755
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.0000	0.2500
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.7500
IDE	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000

Normalised Numerical Ranking of Factors on Conception Phase by PM in LGA_NW (Step 3)

		EE	CO				TE				EIS		IDE	
		Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust	
E	CO	Legislation and Policy	1	0	0	0	0	0	0	0	0	0	0	
		Inter-Org. Leadership	0	1	3	5	0	0	0	0	0	0	0	
		Collaboration Culture	0	1/3	1	4	0	0	0	0	0	0	0	
		Organisational Size	0	1/5	1/4	1	0	0	0	0	0	0	0	
E	TE	IT Compatibility	0	0	0	0	1	4	3	4	0	0	0	
		Data Security & Privacy	0	0	0	0	1/4	1	5	4	0	0	0	
		Information Quality	0	0	0	0	1/3	1/5	1	3	0	0	0	
		Tech. Interoperability	0	0	0	0	1/4	1/4	1/3	1	0	0	0	
E	EIS	Benefit of EIS	0	0	0	0	0	0	0	0	1	1/3	0	
		Risk of EIS	0	0	0	0	0	0	0	0	0	3	1	0
E	IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	1	4
		Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	0	1/4

Pairwise Numerical Ranking of Factors on Proposal Phase by HIT in LGA_NW (Step 2)

		EE	CO				TE				EIS		IDE		Local Weight
Factors		L&P	IOL	CC	OS	ITC	DS&P	IQ	TI	BEIS	REIS	BPC	IDT		
CO	L&P	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	
	IOL	0.0000	0.6521	0.7059	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6193	
	CC	0.0000	0.2173	0.2353	0.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2842	
	OS	0.0000	0.1304	0.0588	0.1000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0964	
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.5454	0.7339	0.3214	0.3333	0.0000	0.0000	0.0000	0.0000	0.4835	
	DS&P	0.0000	0.0000	0.0000	0.0000	0.1364	0.1834	0.5357	0.3333	0.0000	0.0000	0.0000	0.0000	0.2972	
	IQ	0.0000	0.0000	0.0000	0.0000	0.1818	0.0366	0.1071	0.2500	0.0000	0.0000	0.0000	0.0000	0.1438	
	TI	0.0000	0.0000	0.0000	0.0000	0.1364	0.0458	0.0357	0.0833	0.0000	0.0000	0.0000	0.0000	0.0753	
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2499	0.0000	0.0000	0.2499	
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.7500	
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.8000	
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.2000	

Normalised Numerical Ranking of Factors on Proposal Phase by HIT in LGA_NW (Step 3)

		EE	CO				TE				EIS		IDE	
		Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust	
EE	CO	Legislation and Policy	1	0	0	0	0	0	0	0	0	0	0	
	Inter-Org. Leadership	0	1	3	4	0	0	0	0	0	0	0	0	
	Collaboration Culture	0	1/3	1	2	0	0	0	0	0	0	0	0	
	Organisational Size	0	1/4	1/2	1	0	0	0	0	0	0	0	0	
TE	IT Compatibility	0	0	0	0	1	3	4	3	0	0	0	0	
	Data Security & Privacy	0	0	0	0	1/3	1	3	5	0	0	0	0	
	Information Quality	0	0	0	0	1/4	1/3	1	4	0	0	0	0	
	Tech. Interoperability	0	0	0	0	1/3	1/5	1/4	1	0	0	0	0	
EIS	Benefit of EIS	0	0	0	0	0	0	0	0	1	1/3	0	0	
	Risk of EIS	0	0	0	0	0	0	0	0	3	1	0	0	
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	1	3	
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1/3	1	

Pairwise Numerical Ranking of Factors on Proposal Phase by ISM in LGA_NW (Step 2)

		EE	CO				TE				EIS		IDE		Local Weight
Factors		L&P	IOL	CC	OS	ITC	DS&P	IQ	TI	BEIS	REIS	BPC	IDT		
CO	L&P	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	
	IOL	0.0000	0.6316	0.6666	0.5714	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6232	
	CC	0.0000	0.2105	0.2222	0.2857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2395	
	OS	0.0000	0.1579	0.1111	0.1428	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1373	
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.5217	0.6618	0.4848	0.2308	0.0000	0.0000	0.0000	0.0000	0.4748	
	DS&P	0.0000	0.0000	0.0000	0.0000	0.1739	0.2205	0.3636	0.3846	0.0000	0.0000	0.0000	0.0000	0.2856	
	IQ	0.0000	0.0000	0.0000	0.0000	0.1304	0.0735	0.1212	0.3077	0.0000	0.0000	0.0000	0.0000	0.1582	
	TI	0.0000	0.0000	0.0000	0.0000	0.1739	0.0441	0.0303	0.0769	0.0000	0.0000	0.0000	0.0000	0.0813	
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2499	0.0000	0.0000	0.2499	
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.7500	
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7501	0.7500	0.7500	
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.2499	

Normalised Numerical Ranking of Factors on Proposal Phase by ISM in LGA_NW (Step 3)

		EE	CO				TE				EIS		IDE	
		Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust	
EE	CO	Legislation and Policy	1	0	0	0	0	0	0	0	0	0	0	
		Inter-Org. Leadership	0	1	3	3	0	0	0	0	0	0	0	
		Collaboration Culture	0	1/3	1	4	0	0	0	0	0	0	0	
		Organisational Size	0	1/3	1/4	1	0	0	0	0	0	0	0	
TE	TE	IT Compatibility	0	0	0	0	1	3	3	4	0	0	0	
		Data Security & Privacy	0	0	0	0	1/3	1	5	6	0	0	0	
		Information Quality	0	0	0	0	1/3	1/5	1	4	0	0	0	
		Tech. Interoperability	0	0	0	0	1/4	1/6	1/4	1	0	0	0	
EIS	EIS	Benefit of EIS	0	0	0	0	0	0	0	0	1	1/2	0	
		Risk of EIS	0	0	0	0	0	0	0	0	2	1	0	
IDE	IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	1	
		Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1/4	

Pairwise Numerical Ranking of Factors on Proposal Phase by PTL in LGA_NW (Step 2)

		EE	CO				TE				EIS		IDE		Local Weight
Factors		L&P	IOL	CC	OS	ITC	DS&P	IQ	TI	BEIS	REIS	BPC	IDT		
CO	L&P	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	
	IOL	0.0000	0.6000	0.7059	0.3750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5603	
	CC	0.0000	0.2000	0.2353	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3118	
	OS	0.0000	0.2000	0.0588	0.1250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1279	
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.5217	0.6870	0.3243	0.2666	0.0000	0.0000	0.0000	0.0000	0.4499	
	DS&P	0.0000	0.0000	0.0000	0.0000	0.1739	0.2290	0.5405	0.4000	0.0000	0.0000	0.0000	0.0000	0.3358	
	IQ	0.0000	0.0000	0.0000	0.0000	0.1739	0.0458	0.1081	0.2666	0.0000	0.0000	0.0000	0.0000	0.5944	
	TI	0.0000	0.0000	0.0000	0.0000	0.1304	0.0981	0.0270	0.0666	0.0000	0.0000	0.0000	0.0000	0.0805	
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3333	0.3333	0.0000	0.0000	0.3333	
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6666	0.6666	0.0000	0.0000	0.6666	
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.8000	
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.2000	

Normalised Numerical Ranking of Factors on Proposal Phase by PTL in LGA_NW (Step 3)

		EE	CO				TE				EIS		IDE	
		Legislation and Policy	Inter-Org. Leadership	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust	
CO	Legislation and Policy	1	0	0	0	0	0	0	0	0	0	0	0	
	Inter-Org. Leadership	0	1	3	4	0	0	0	0	0	0	0	0	
	Collaboration Culture	0	1/3	1	2	0	0	0	0	0	0	0	0	
	Organisational Size	0	1/4	1/2	1	0	0	0	0	0	0	0	0	
TE	IT Compatibility	0	0	0	0	1	2	4	5	0	0	0	0	
	Data Security & Privacy	0	0	0	0	1/2	1	3	5	0	0	0	0	
	Information Quality	0	0	0	0	1/4	1/3	1	4	0	0	0	0	
	Tech. Interoperability	0	0	0	0	1/5	1/5	1/4	1	0	0	0	0	
EIS	Benefit of EIS	0	0	0	0	0	0	0	0	1	1/4	0	0	
	Risk of EIS	0	0	0	0	0	0	0	0	4	1	0	0	
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	1	4	
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	1/4	1	

Pairwise Numerical Ranking of Factors on Proposal Phase by PM in LGA_NW (Step 2)

		EE	CO				TE				EIS		IDE		Local Weight
Factors		L&P	IOL	CC	OS	ITC	DS&P	IQ	TI	BEIS	REIS	BPC	IDT		
CO	L&P	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	
	IOL	0.0000	0.6316	0.6666	0.5714	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6232	
	CC	0.0000	0.2105	0.2222	0.2857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2395	
	OS	0.0000	0.1579	0.1111	0.1428	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1373	
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.5128	0.5660	0.4848	0.3333	0.0000	0.0000	0.0000	0.0000	0.4742	
	DS&P	0.0000	0.0000	0.0000	0.0000	0.2564	0.2830	0.3636	0.3333	0.0000	0.0000	0.0000	0.0000	0.3090	
	IQ	0.0000	0.0000	0.0000	0.0000	0.1282	0.0943	0.1212	0.2666	0.0000	0.0000	0.0000	0.0000	0.1526	
	TI	0.0000	0.0000	0.0000	0.0000	0.1026	0.0566	0.0303	0.0666	0.0000	0.0000	0.0000	0.0000	0.0640	
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.0000	0.0000	0.2000	
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.0000	0.0000	0.8000	
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.8000	
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.2000	

Normalised Numerical Ranking of Factors on Proposal Phase by PM in LGA_NW (Step 3)

		EE			CO			TE			EIS			IDE	
Factors		Political Pressure	Legislation and Policy	Community Pressure	Return on Investment	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Cost of EIS	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/3	1/4	0	0	0	0	0	0	0	0	0	0	0
	Legislation and Policy	3	1	1/4	0	0	0	0	0	0	0	0	0	0	0
	Community Pressure	4	4	1	0	0	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/3	1/2	0	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	3	1	4	0	0	0	0	0	0	0	0
	Organisational Size	0	0	0	2	1/4	1	0	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	0	1	2	1/4	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	0	1/2	1	1/3	0	0	0	0	0
	Information Quality	0	0	0	0	0	0	4	3	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	0	1	2	1/4	0	0
	Benefit of EIS	0	0	0	0	0	0	0	0	0	2	1	1/3	0	0
	Risk of EIS	0	0	0	0	0	0	0	0	0	4	3	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	0	0	1	4
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	0	0	1/4	1

Pairwise Numerical Ranking of Factors on Participation Phase by HIT in LGA_NW (Step 2)

		EE			CO			TE			EIS			IDE		Local Weight
Factors		PP	L&P	CP	ROI	CC	OS	ITC	DS&P	IQ	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.1250	0.0624	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3052
	L&P	0.3750	0.1875	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2430
	CP	0.5000	0.7500	0.6666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6388
CO	ROI	0.0000	0.0000	0.0000	0.1666	0.2105	0.0909	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4287
	CC	0.0000	0.0000	0.0000	0.5000	0.6316	0.7272	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6196
	OS	0.0000	0.0000	0.0000	0.3333	0.1579	0.1818	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2243
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1818	0.3333	0.1579	0.0000	0.0000	0.0000	0.0000	0.0000	0.2243
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0909	0.1666	0.2105	0.0000	0.0000	0.0000	0.0000	0.0000	0.1560
	IQ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7272	0.5000	0.6316	0.0000	0.0000	0.0000	0.0000	0.0000	0.6196
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1428	0.3333	0.1579	0.0000	0.0000	0.2113
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2857	0.1666	0.2105	0.0000	0.0000	0.2209
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5714	0.5000	0.6316	0.0000	0.0000	0.5676
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.8000	0.8000
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	0.2000	0.2000

Normalised Numerical Ranking of Factors on Participation Phase by HIT in LGA_NW (Step 3)

		EE			CO			TE			EIS			IDE	
Factors		Political Pressure	Legislation and Policy	Community Pressure	Return on Investment	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Cost of EIS	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	2	1/3	0	0	0	0	0	0	0	0	0	0	0
	Legislation and Policy	1/2	1	2	0	0	0	0	0	0	0	0	0	0	0
	Community Pressure	3	1/2	1	0	0	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/4	1/3	0	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	4	1	2	0	0	0	0	0	0	0	0
	Organisational Size	0	0	0	3	1/2	1	0	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	0	1	1/3	1/4	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	0	3	1	1/4	0	0	0	0	0
	Information Quality	0	0	0	0	0	0	4	4	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	0	1	3	1/3	0	0
	Benefit of EIS	0	0	0	0	0	0	0	0	0	1/3	1	1/5	0	0
	Risk of EIS	0	0	0	0	0	0	0	0	0	3	5	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	0	0	1	3
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	0	0	1/3	1

Pairwise Numerical Ranking of Factors on Participation Phase by ISM in LGA_NW (Step 2)

	Factors	EE			CO			TE			EIS			IDE		Local Weight
		PP	L&P	CP	ROI	CC	OS	ITC	DS&P	IQ	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.2222	0.5714	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2978
	L&P	0.1111	0.2857	0.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3322
	CP	0.6666	0.1428	0.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3698
CO	ROI	0.0000	0.0000	0.0000	0.1250	0.1428	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1226
	CC	0.0000	0.0000	0.0000	0.5000	0.5714	0.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5571
	OS	0.0000	0.0000	0.0000	0.3750	0.2857	0.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3202
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1250	0.0624	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.1180
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	0.1875	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.2847
	IQ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3750	0.7500	0.6666	0.0000	0.0000	0.0000	0.0000	0.0000	0.5972
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2308	0.3333	0.2174	0.0000	0.0000	0.2605
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0769	0.1111	0.1304	0.0000	0.0000	0.1061
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6923	0.5555	0.6522	0.0000	0.0000	0.6148
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.7500
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.2499

Normalised Numerical Ranking of Factors on Participation Phase by ISM in LGA_NW (Step 3)

		EE			CO			TE			EIS			IDE	
Factors		Political Pressure	Legislation and Policy	Community Pressure	Return on Investment	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Cost of EIS	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/5	1/4	0	0	0	0	0	0	0	0	0	0	0
	Legislation and Policy	5	1	1	0	0	0	0	0	0	0	0	0	0	0
	Community Pressure	4	1	1	0	0	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/4	1/3	0	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	4	1	2	0	0	0	0	0	0	0	0
	Organisational Size	0	0	0	3	1/2	1	0	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	0	1	3	1/5	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	0	1/3	1	2	0	0	0	0	0
	Information Quality	0	0	0	0	0	0	5	2	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	0	1	3	1/4	0	0
	Benefit of EIS	0	0	0	0	0	0	0	0	0	1/3	1	1/4	0	0
	Risk of EIS	0	0	0	0	0	0	0	0	0	4	4	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	0	0	1	1/4
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	0	0	4	1

Pairwise Numerical Ranking of Factors on Participation Phase by PTL in LGA_NW (Step 2)

		EE			CO			TE			EIS			IDE		Local Weight
Factors		PP	L&P	CP	ROI	CC	OS	ITC	DS&P	IQ	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.1000	0.0909	0.1111	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1006
	L&P	0.5000	0.4545	0.4444	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4663
	CP	0.4000	0.4545	0.4444	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.4329
CO	ROI	0.0000	0.0000	0.0000	0.1250	0.1428	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1226
	CC	0.0000	0.0000	0.0000	0.5000	0.5714	0.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5571
	OS	0.0000	0.0000	0.0000	0.3750	0.2857	0.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3202
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1579	0.5000	0.0625	0.0000	0.0000	0.0000	0.0000	0.0000	0.2401
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0526	0.1666	0.6250	0.0000	0.0000	0.0000	0.0000	0.0000	0.2814
	IQ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7895	0.3333	0.3125	0.0000	0.0000	0.0000	0.0000	0.0000	0.4784
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1875	0.3750	0.1666	0.0000	0.0000	0.2430
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0625	0.1250	0.1666	0.0000	0.0000	0.1180
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.5000	0.6666	0.0000	0.0000	0.6388
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.2000	0.5000
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.2000	0.5000

Normalised Numerical Ranking of Factors on Participation Phase by PTL in LGA_NW (Step 3)

		EE			CO			TE			EIS			IDE	
Factors		Political Pressure	Legislation and Policy	Community Pressure	Return on Investment	Collaboration Culture	Organisational Size	IT Compatibility	Data Security & Privacy	Information Quality	Cost of EIS	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/4	3	0	0	0	0	0	0	0	0	0	0	0
	Legislation and Policy	4	1	4	0	0	0	0	0	0	0	0	0	0	0
	Community Pressure	1/3	1/4	1	0	0	0	0	0	0	0	0	0	0	0
CO	Return on Investment	0	0	0	1	1/3	2	0	0	0	0	0	0	0	0
	Collaboration Culture	0	0	0	3	1	4	0	0	0	0	0	0	0	0
	Organisational Size	0	0	0	1/2	1/4	1	0	0	0	0	0	0	0	0
TE	IT Compatibility	0	0	0	0	0	0	1	1/4	1/3	0	0	0	0	0
	Data Security & Privacy	0	0	0	0	0	0	4	1	1/3	0	0	0	0	0
	Information Quality	0	0	0	0	0	0	3	3	1	0	0	0	0	0
EIS	Cost of EIS	0	0	0	0	0	0	0	0	0	1	4	1/3	0	0
	Benefit of EIS	0	0	0	0	0	0	0	0	0	1/4	1	1/4	0	0
	Risk of EIS	0	0	0	0	0	0	0	0	0	3	4	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	0	0	0	0	1	1/5
	Inter-departmental Trust	0	0	0	0	0	0	0	0	0	0	0	0	5	1

Pairwise Numerical Ranking of Factors on Participation Phase by PM in LGA_NW (Step 2)

		EE			CO			TE			EIS			IDE		Local Weight
Factors		PP	L&P	CP	ROI	CC	OS	ITC	DS&P	IQ	CEIS	BEIS	REIS	IDT	CM	
EE	PP	0.1875	0.1666	0.3750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2430
	L&P	0.7500	0.6666	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6389
	CP	0.0625	0.1666	0.1250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1180
CO	ROI	0.0000	0.0000	0.0000	0.2222	0.2105	0.2857	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2400
	CC	0.0000	0.0000	0.0000	0.6666	0.6316	0.5714	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6232
	OS	0.0000	0.0000	0.0000	0.1111	0.1579	0.1428	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1373
TE	ITC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1250	0.0588	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1279
	DS&P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	0.2353	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3118
	IQ	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3750	0.7059	0.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5603
EIS	CEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2353	0.4444	0.2105	0.0000	0.0000	0.2967
	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0589	0.1111	0.1579	0.0000	0.0000	0.1093
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7059	0.4444	0.6316	0.0000	0.0000	0.5939
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666	0.1666	0.1666
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8333	0.8333	0.8333

Normalised Numerical Ranking of Factors on Participation Phase by PM in LGA_NW (Step 3)

		EE		CO		TE		EIS		IDE	
		Political Pressure	Community Pressure	Collaboration Culture	Organisational Size	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/3	0	0	0	0	0	0	0	0
	Community Pressure	3	1	0	0	0	0	0	0	0	0
CO	Collaboration Culture	0	0	1	5	0	0	0	0	0	0
	Organisational Size	0	0	1/5	1	0	0	0	0	0	0
TE	Information Quality	0	0	0	0	1	2	0	0	0	0
	Tech. Interoperability	0	0	0	0	1/2	1	0	0	0	0
EIS	Benefit of EIS	0	0	0	0	0	0	1	3	0	0
	Risk of EIS	0	0	0	0	0	0	1/3	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	1	1/4
	Inter-departmental Trust	0	0	0	0	0	0	0	0	4	1

Pairwise Numerical Ranking of Factors on Sustainability Phase by HIT in LGA_NW (Step 2)

		EE		CO		TE		EIS		IDE		Local Weight
Factors		PP	CP	CC	OS	IQ	TI	BEIS	REIS	BPC	IDT	
EE	PP	0.2500	0.2499	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
	CP	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
CO	CC	0.0000	0.0000	0.8333	0.8333	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8333
	OS	0.0000	0.0000	0.1666	0.1666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1666
TE	IQ	0.0000	0.0000	0.0000	0.0000	0.6666	0.6666	0.0000	0.0000	0.0000	0.0000	0.6666
	TI	0.0000	0.0000	0.0000	0.0000	0.3333	0.3333	0.0000	0.0000	0.0000	0.0000	0.3333
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.7500
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.2499
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.2000	0.5000
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8000	0.2000	0.5000

Normalised Numerical Ranking of Factors on Sustainability Phase by HIT in LGA_NW (Step 3)

		EE		CO		TE		EIS		IDE	
		Political Pressure	Community Pressure	Collaboration Culture	Organisational Size	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/6	0	0	0	0	0	0	0	0
	Community Pressure	6	1	0	0	0	0	0	0	0	0
CO	Collaboration Culture	0	0	1	3	0	0	0	0	0	0
	Organisational Size	0	0	1/3	1	0	0	0	0	0	0
TE	Information Quality	0	0	0	0	1	5	0	0	0	0
	Tech. Interoperability	0	0	0	0	1/5	1	0	0	0	0
EIS	Benefit of EIS	0	0	0	0	0	0	1	1	0	0
	Risk of EIS	0	0	0	0	0	0	1	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	1	3
	Inter-departmental Trust	0	0	0	0	0	0	0	0	1/3	1

Pairwise Numerical Ranking of Factors on Sustainability Phase by ISM in LGA_NW (Step 2)

	Factors	EE		CO		TE		EIS		IDE		Local Weight
		PP	CP	CC	OS	IQ	TI	BEIS	REIS	BPC	IDT	
EE	PP	0.1428	0.1428	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1428
	CP	0.8571	0.5871	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.8571
CO	CC	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	OS	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
TE	IQ	0.0000	0.0000	0.0000	0.0000	0.8333	0.8333	0.0000	0.0000	0.0000	0.0000	0.8333
	TI	0.0000	0.0000	0.0000	0.0000	0.1666	0.1666	0.0000	0.0000	0.0000	0.0000	0.1666
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	0.5000	0.0000	0.0000	0.5000
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000	0.5000	0.0000	0.0000	0.5000
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.7500
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.2499

Normalised Numerical Ranking of Factors on Sustainability Phase by ISM in LGA_NW (Step 3)

		EE		CO		TE		EIS		IDE	
		Political Pressure	Community Pressure	Collaboration Culture	Organisational Size	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/4	0	0	0	0	0	0	0	0
	Community Pressure	4	1	0	0	0	0	0	0	0	0
CO	Collaboration Culture	0	0	1	3	0	0	0	0	0	0
	Organisational Size	0	0	1/3	1	0	0	0	0	0	0
TE	Information Quality	0	0	0	0	1	6	0	0	0	0
	Tech. Interoperability	0	0	0	0	1/6	1	0	0	0	0
EIS	Benefit of EIS	0	0	0	0	0	0	1	1/3	0	0
	Risk of EIS	0	0	0	0	0	0	3	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	1	1/3
	Inter-departmental Trust	0	0	0	0	0	0	0	0	3	1

Pairwise Numerical Ranking of Factors on Sustainability Phase by PTL in LGA_NW (Step 2)

		EE		CO		TE		EIS		IDE		Local Weight
Factors		PP	CP	CC	OS	IQ	TI	BEIS	REIS	BPC	IDT	
EE	PP	0.8000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
	CP	0.8000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
CO	CC	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	OS	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
TE	IQ	0.0000	0.0000	0.0000	0.0000	0.8572	0.8572	0.0000	0.0000	0.0000	0.0000	0.8572
	TI	0.0000	0.0000	0.0000	0.0000	0.1428	0.1428	0.0000	0.0000	0.0000	0.0000	0.1428
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500	0.2499	0.0000	0.0000	0.2500
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.7500
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500

Normalised Numerical Ranking of Factors on Sustainability Phase by ISM in LGA_NW (Step 3)

		EE		CO		TE		EIS		IDE	
		Political Pressure	Community Pressure	Collaboration Culture	Organisational Size	Information Quality	Tech. Interoperability	Benefit of EIS	Risk of EIS	Business Process Com.	Inter-departmental Trust
EE	Political Pressure	1	1/4	0	0	0	0	0	0	0	0
	Community Pressure	4	1	0	0	0	0	0	0	0	0
CO	Collaboration Culture	0	0	1	3	0	0	0	0	0	0
	Organisational Size	0	0	1/3	1	0	0	0	0	0	0
TE	Information Quality	0	0	0	0	1	3	0	0	0	0
	Tech. Interoperability	0	0	0	0	1/3	1	0	0	0	0
EIS	Benefit of EIS	0	0	0	0	0	0	1	1/2	0	0
	Risk of EIS	0	0	0	0	0	0	2	1	0	0
IDE	Business Process Com.	0	0	0	0	0	0	0	0	1	3
	Inter-departmental Trust	0	0	0	0	0	0	0	0	1/3	1

Pairwise Numerical Ranking of Factors on Sustainability Phase by PM in LGA_NW (Step 2)

		EE		CO		TE		EIS		IDE		Local Weight
Factors		PP	CP	CC	OS	IQ	TI	BEIS	REIS	BPC	IDT	
EE	PP	0.8000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
	CP	0.8000	0.2000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
CO	CC	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500
	OS	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499
TE	IQ	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.0000	0.0000	0.0000	0.0000	0.7500
	TI	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.0000	0.0000	0.0000	0.0000	0.2499
EIS	BEIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.3333	0.3333	0.0000	0.0000	0.3333
	REIS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6666	0.6666	0.0000	0.0000	0.6666
IDE	BPC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.7500	0.7500	0.7500
	IDT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2499	0.2500	0.2500

Normalised Numerical Ranking of Factors on Sustainability Phase by PM in LGA_NW (Step 3)