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AN ANALYTICAL FRAMEWORK FOR WORKFLOW TECHNOLOGY ADOPTION IN LOCAL GOVERNMENT AUTHORITIES

Thesis submitted for the degree of Doctor of Philosophy by

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‘O lord! Increase me in knowledge.’

[Surah Taha: Ayah 114]

ABSTRACT

The focus of the study is to develop a novel framework of workflow technology adoption (WAF) for public policy making. Workflow technology (WfT) has emerged to support both technological and economic importance for private and public organisations to meet competitive business and computational environment. Despite all the benefits of WfT, there has been limited adoption by policy makers. One of the reasons for this is the lack of a theoretical framework for researchers and a tool for decision makers that help in evaluating WfT adoption. Due to the limited knowledge on workflow adoption, from the socio-technical and organisational side, an academic challenge is to identify the key factors that influence adoption.

To overcome these limitations, the proposed workflow adoption framework is based on the amalgamation of Technology, Organisation, Environment and Task Technology Fit theories that is evaluated and extended by using a qualitative multiple case study approach. Qualitative content analysis of the empirical data collected from three UK local government authorities resulted in a novel framework for WfT adoption, particularly for the policy making context, that has 17 factors, which influence adoption decisions. Findings revealed that *attitude, organisation structure* and *competition* did not have any influential role due to immense managerial support, constructive communication and thorough training provided to employees. Also, *competition* as an environmental factor had no influence over the adoption of WfT, since public services do not compete like in the private sector over market share, instead imitative pressure emerged due to close collaboration with neighbouring LGAs. It was also found that stakeholders and timescale had influence on the decisions and collection proved to be an important task characteristic of the LGAs.

The major contribution of the framework is that it provides an understanding of the phenomenon by identifying key factors from the contextual perspective (i) technological set (*complexity, relative advantage, compatibility and timescale*), (ii) organisational set (*managerial support, cost, information intensity and stakeholders), (iii)* environmental set (government regulations and imitative pressure). In addition, it identifies functional fit of WfT with the task requirements by classifying functions (*communication, information processing and process structuring*) and policy making task characteristics (*generation, choice, collection and combination*) and then analysing the fit. Together it provides a holistic understanding of the phenomenon that aids informed decision making relevant to WfT adoption. Although, the literature has emphasised the technical aspects so far, this study contributes to future studies through organisational and managerial knowledge, classifying WfT's functions and policy making task characteristics. Practical implications exist for the policy makers who can adopt the WAF as a recommendation tool to make informed decisions and achieve competitive advantage.

Keywords: Workflow technology, IT adoption, decision making, policy making process and e-government.

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Declaration

This dissertation gives an account of the study undertaken by Farhana Sajjad. I confirm that this work is own and all the references used are cited. The publication and conference, which were achieved as part of this research, are as follows:

Refereed Journal and conference papers published/accepted (In-Press)

- Jaewon, C., Hong, J. L., Sajjad, F. and Lee, H. (2011). The Influencing Factors of Adopting Mobile Recommendation Services. *Technological Forecasting and Social Change.* (In Press)

- Sajjad, F., Lee, H. Kamal, M., and Irani, Z. (2011). Research Note: Workflow Technology as an e-Participation Tool, *Journal of Enterprise Information Management*, 26 (2). 197 - 212

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Dedication

This thesis is dedicated to the loving memory of my late grandmother (May Allah grants her eternal peace) who always desired and prayed for my success but did not live to see this great accomplishment. Also, to my gorgeous nieces Eshal Rehan and Mia Khan who fill my life with hope and rejuvenate me during the hard times. Last but not the least; I dedicate this work to my loving husband who has desired this achievement more than me and without whom, reaching for this dream would have been a solitary struggle.

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CHAPTER 1:INTRODUCTION

1.0 Introduction

The adoption of effective information technology to increase an organisation's performance has been recognized by the industry and extensively studied by several researchers. Value adding business processes are a prerequisite for the organisation's success (Aguilar-Saven and Olhager, 2002). The importance of business process was first coined by Levitt (1960) and advocated later by Harrington (1991), Davenport (1993) and Hammer (1990). Recognizing the need to have expeditious business processes that create a smooth flow of information between the participants, error free execution of tasks, timely sharing of information and efficient collaborative support encourage growth in methodologies, business process modelling techniques and tools. Over the last decade many technologies have emerged to support business processes, such as Enterprise Resource Planning (ERP) systems, Enterprise Data Interchange (EDI), Customer Relationship Management (CRM) systems, Workflow Management Systems (WfMS).

Workflow technology (WfT) plays an important role as a panacea for the age-old problem of controlling, coordinating, monitoring, optimizing and supporting business processes. Workflows are used to model business processes by abstracting business process information and presenting it in a more structured and computer readable manner, which can be automated completely or partially using WfMS software. WfMS is computer software that manages and automates the process of sending information, documents and tasks from one organisational employee or machine to another (Georgeakopoulos and Hornick, 1995; Wescott, 2001; Wang *et al*., 2006). The term "workflow" used in this thesis is defined as a system for modelling and automating business processes. Proposing workflow systems as a technical solution is beyond the scope of this thesis that is concerned with advocating the adoption of workflow technology for policy making processes such as optimizing operations management.

Workflow technology is recognized for optimizing structured and non-structured business processes, to achieve run-time efficiency, increased productivity and cost reduction as discussed in chapter 2. These benefits are also addressed in the literature as motivational factors for workflow adoption (Lousa *et al.*, 2000). According to Stark and Lachal (1995), organisations adopt workflow technology to achieve increased efficiency, higher control, consistency and better management of processes. Both the private and public sectors have benefited from the adoption of workflow technology, however, on the public side, workflow adoption is mainly carried out for administrative tasks (Lee *et al.*, 2011). Further potential is expected for achieving efficiency in decision making (Lousa *et al.*, 2000). Additionally, a study by Tsohou *et al*. (2012) suggested workflow adoption for policy making processes for effective decision making and policy outputs. Lee *et al*. (2011) proposed a workflow model for increasing citizen participation, achieving higher transparency and providing tracking services to citizens. However, the importance of understanding the key factors in workflow adoption is not limited to performance efficiency motives only. It is important to understand contextual (internal and external organisation) and functional (technological features) aspects, which play an important role in facilitating workflow adoption. Therefore, this thesis conducts an exploratory study to identify facilitating conditions of workflow system adoption in the public policy making process, by investigating technological, organisational and functional context.

This chapter introduces the rationale for undertaking this research, the aims and objectives of the research, the research question and outlines the thesis.

1.1 Research Background

Business process has been defined as a set of logical tasks, carried out by people or information systems to achieve set goals (Davenport and Short, 1990). Organisational success is attributed to efficient business process and execution. In the past, functional hierarchy was seen as key to organisation performance (Aalst and Hee, 2000) but now business processes are seen to be playing a more vital role in the success of the organisation, especially with the advent of IT support. Business processes exist in both the private and public sectors with some distinct set of goals to achieve, such as processing insurance claims, loans, admission applications, licence applications, policies etc. The public sector is more service oriented than the private sector, which carries out the production of both goods and services. Public sector processes are categorised as information processing where large amounts of data or information is gathered, analysed and, after processing, results in output for end users. Whether it is a public or private business process, all processes need to perform efficiently for the success of the organisation. This need requires improvements in designing the business process and utilising appropriate IT capabilities. Davenport and Short (1990) suggest business processes should be redesigned in response to the evolution of IT capabilities to increase the efficiency of the business process by reducing cost and time and improving the quality of the output and workflow.

Local Government Authorities (LGAs) in the UK are responsible for providing services to local residents in their allotted geographical areas (principal areas). These services tend to meet the needs of the citizens who require a service with regards to housing, benefits, social services, education and management etc. The institutional and political structure of the LGAs in the UK is very complex (Bevir *et al*., 2003), therefore, the provision of public social services has been categorised according to type. This categorisation varies across the LGAs however they fall into either of the two types, single tier or two tier authorities. The responsibility of the single-tier authority covers all the local authority services in its area and two-tier authorities divide responsibilities 80% to county councils and the rest to district councils as shown in Table 1.1 (LGA, 2011). In England there are five different types of local authorities whereas Wales and Scotland for the most part have unitary authorities in their principal areas and Northern Ireland has district councils only. There are collectively 353 LGAs in England, 32 Unitary Authorities in Scotland, 22 Unitary Authorities in Wales and 26 District councils in Northern Ireland (Councillor’s guide, 2012).

Services	County councils (two-tier)	District, Borough and City council (two-tier)	Unitary authority, London boroughs, metropolitan borough (single-tier)
Education	✓		✓
Transport	✓		✓
Planning	✓		✓
Fire and public safety	✓		✓
Social care	✓		✓
Libraries	✓		✓
Trading standards	✓		✓
Waste management		✓	✓
Rubbish collection		✓	✓
Recycling		✓	✓
Council Tax collections		✓	✓
Housing		✓	✓
Planning applications		✓	✓

Table 1.1: LGA service responsibilities (LGA, 2011)

The LGAs provide over 700 services to the residents in their areas, sometimes independently and other times in collaboration with local partners such as NHS, local charities, police etc. Under the power of the Local Government Act 2000, they are also responsible for the economic, social and environmental aspects of their areas (LGA, 2011). There exists not only collaboration with local partners but residents as well. Greater involvement with the residents allows LGAs to better meet the needs of the residents and set priorities.

Workflow systems have evolved to better meet the need of process reengineering, automation and information processing. It is responsible for providing the right information to the right resource (person or software) at the right time (Aalst and Hee, 2000). There exists confusion in the literature about the definition of workflow (Stohr and Zhao, 2001). For some, workflow is a technique that abstracts and defines a business process that can be used to analyse and understand business processes for improvement. On the other hand, it is a system that provides business process definitions, which contains the conditions and rules for executing the task using IT. Aalst and Hee (2000) has supported this notion on similar grounds. The Workflow Management Coalition is a global organisation developed in 1993, which offers workflow definition and a standards development program. By the definition provided by the coalition (Fischer, 2001), workflow is “the automation of a business process, in whole or in part, during which documents, information or tasks are passed from one participant to another for actions, according to a set of procedural rules”. Therefore, workflow can be seen as a mechanism to present business processes in a more structured, computer readable format that can be automated using WfMS software. The author of this thesis sees workflow systems as divided into two domains, one that deals with modelling a business process and the other that executes and automates the process with computers.

Modelling business processes with workflow allows analysing processes for improvements such as eliminating repetitive or unnecessary tasks, minimising run time errors, efficient execution of each task on time and it also give structure to less structured processes. Workflow models a business process by abstracting information on tasks, sequences, roles, conditions and rules. These are then defined into a workflow model. Workflow models can be used by WfMS to automate tasks execution and correct completion. Any organisation that has information, documents or tasks that needs to be passed from one resource to another for processing can be automated using workflow technology. It can be executed within an organisation between departments or between an organisation and multiple organisations, or participants from outside the organisation. According to Baresi *et al.*, (1999) workflows can support business processes that have one of the following criteria; a clear structure, several roles, data that can be electronically stored and control and monitoring requirements. It highlights an opportunity for public policy makers to reap benefits from workflow technology for policy formulation. In public policy making information processing is large and complex. Due to the large number of citizens involved with varied roles, from wider geographic location, in the consultation stage. Policies are the result of issues highlighted and information gathered internally or externally, which can be electronically stored, and processing of the information to come up with the decisions or policies. Coordination and collaboration is needed to avoid delays and provide correct information for making the right decisions, therefore control and monitoring is vital for the successful completion of the process. On the whole, workflow systems can give structure to the policy making process, enhance policy output by providing automated coordination, collaboration, controlling and monitoring capabilities that play an important role in the policy formulation process. However, the use of the system has been limited to office automation (Lee *et al.*, 2011).

Workflows have been adopted in both the private and public sectors because of its benefits. In the United States and United Kingdom almost 50% of workflow systems adoption was in public sector (Schal, 1998). In the UK workflow technology has proliferated in healthcare, Ministry of Defence, Police forces, Local Authorities and universities (Kerschner and Raaf, 2008; FLOvate, 2006). According to the "Workflow Management Systems Market 2010-2013" survey, the adoption of workflow in the private sector has increased productivity by 50% and response time has been reduced 20%. Also, InfoTrends' Global and North American print production workflow market forecast: 2011-2016 reported 9.3% growth for workflow software sales in year 2011 and a compound average growth rate in the year 2016 of 7.8%, despite the poor US economic conditions. This is due to the high demand for achieving efficiency in coordination and collaboration aspects of the business processes.

A high growth rate of adoption of workflow systems necessitates an understanding of influential factors, other than advantages associated with workflow systems adoption. It is important to understand the key factors influencing the decision to adopt workflow technology. Seeking answers about the benefits of adoption ignores some of the important contextual and functional influences. Context is important, as it is where the technology will be adopted, such as the behavioural and structural aspects of the organisation that influence decisions to adopt IT. Functional aspects of IT are also important from the fit perspective between the IT capabilities and task requirements.

Most of the literature on workflow systems is about workflow design and implementation, nonetheless, there are some studies that focus on the effects of workflow on organisations (Kueng, 2000; Sarmento and Machado 2000), expectation of workflow adoption (Lousa *et al.*, 2000) and evaluation of workflow systems (Choenni *et al.*, 2003). However, the literature lacks empirical research on workflow adoption frameworks and facilitating conditions that influence decision makers' perception on adoption. Understanding the key influential factors of workflow adoption in the policy making domain will allow decision makers to prepare well before its implementation. It will also protect them from huge implementation costs, resource loss and direct them to adoption beforehand by analysing the key factors for workflow adoption.

1.2 Research Problems and Gaps

Policy informatics is an emergent research area that advocates the use of IT for policy making and governance (Kim and Johnston, 2008). The use of technology to increase transparency and citizen engagement in public policy making has also been identified as a significant factor (Lee *et al*., 2011; Tsohou *et al*., 2012). Workflow technology has been suggested as a solution to low transparency, impetus to citizen participation and a mechanism for automating the process (Lee *et al*., 2011 and Tsohou *et al*., 2012). Despite the fact that workflow technology entails numerous benefits and the policy making process can be mapped onto workflow models, there is a significant lack of workflow adoption in the policy making domain. One of the reasons attributed to low adoption in policy making domain is the lack of a theoretical framework for researchers and decision makers that helps in evaluating workflow adoption for the policy making process. Also, the literature on workflow technology has concentrated for the most part on the technical aspects of the subject and lacks theoretical contribution (Storh and Zaho, 2001; Zhuge, 2003). Due to this scarcity of relevant knowledge on workflow adoption, from the socio-technical and organisational side, to identify key factors present in the LGA with technology suitability, presents an academic challenge. Therefore, it is important to investigate the contextual aspects of the policy making process (Technological, Organisational and Environmental) and functional fit (technical features) aspects of workflow technology and explore key influential factors of WfT adoption.

1.3 Research Aim, Objectives and Contributions

In this section more explanation of the research aim, objectives and contribution statement has been presented.

1.3.1 Research Aim

The purpose of the investigation in this thesis has been driven by the requirement for IT support in the policy making process (Policy informatics, special issue of *The Public Sector Innovation Journal*) and lack of workflow application in this domain (Lee *et al*., 2011 and Tsohou *et al*., 2012). In the absence of theoretical frameworks for workflow adoption in the literature, it is necessary to identify IT adoption theoretical models at the organisational level for the exploration of key influential factors for the adoption decision. This study adopts technology, organisation, environment theory and Task Technology Fit theory to explore the facilitating factors from the contextual and functional perspectives. In doing so, the study fills the literature gap of limited knowledge on workflow adoption and by identifying key influential factors (novel contribution) for workflow adoption. It also provides decision makers with a recommendation tool for evaluating workflow adoption, which will also give organisations competitive advantage through better evaluation and investment of workflow. Thus the aim of this research is to:

To develop a recommendation framework that can be employed to support decision making regarding workflow technology adoption in policy making context

1.3.2 Objectives

The aim of the research is achieved by fulfilling the following objectives:

i. To comprehensively review the literature in the area of policy making, workflow technology and IT adoption in order to identify supporting theories for building a conceptual framework.

ii. To empirically investigate the important influential factors that can support the decision-making for Wf adoption in the local government authorities.

iii. To develop and evaluate the framework, within the practical arena, and provide a novel contribution to the domain of workflow technology and policy making.

1.4 Research Questions

In order to focus on these aims and objectives, this research develops important research questions that help in designing a data collection strategy and methods and techniques to derive the appropriate data. First, it is vital to understand how policy makers perceive the adoption of workflow for policy making processes. This allows an understanding of the behavioural aspects of the investigation. Information about policy makers' grasp of workflow and their understanding of the technology will help in collecting further information which will help to build the conceptual framework. Next, it is necessary to gather information about under what circumstances, provided within and outside the organisation, policy makers' decisions are influenced. It is important to understand the facilitating conditions for workflow adoption as they build up into a recommendation tool for policy makers to use while deciding about workflow adoption.

- *How are decisions made to adopt workflow technology in local government authorities?*
    - *What are the key contextual level factors for workflow technology adoption particularly in the policy making domain?*
    - *What are the key functional level factors for workflow technology adoption particularly in the policy making domain?*

1.5 Research Approach

The research approach of this study is to apply interpretive and qualitative means to collect and analyse the data. The qualitative approach has been selected after developing and analysing the background and focal theories. The study requires an in depth understanding of the workflow technology adoption phenomenon that has subjective ontological stance in the policy making process. Due to the lack of literature on workflow adoption, it is necessary to identify epistemology of the study, which has been an interpretive qualitative approach to find out the meanings associated with the contextual and functional dimension, rather than measuring significance attached to each dimension. The figure 1.1 shows that the research design is divided into three parts. The first section defines and designs the study. The second section is to prepare, collect and analyse the data while third section evaluates and redesigns the conceptual framework proposed in chapter 3 with the conclusions.

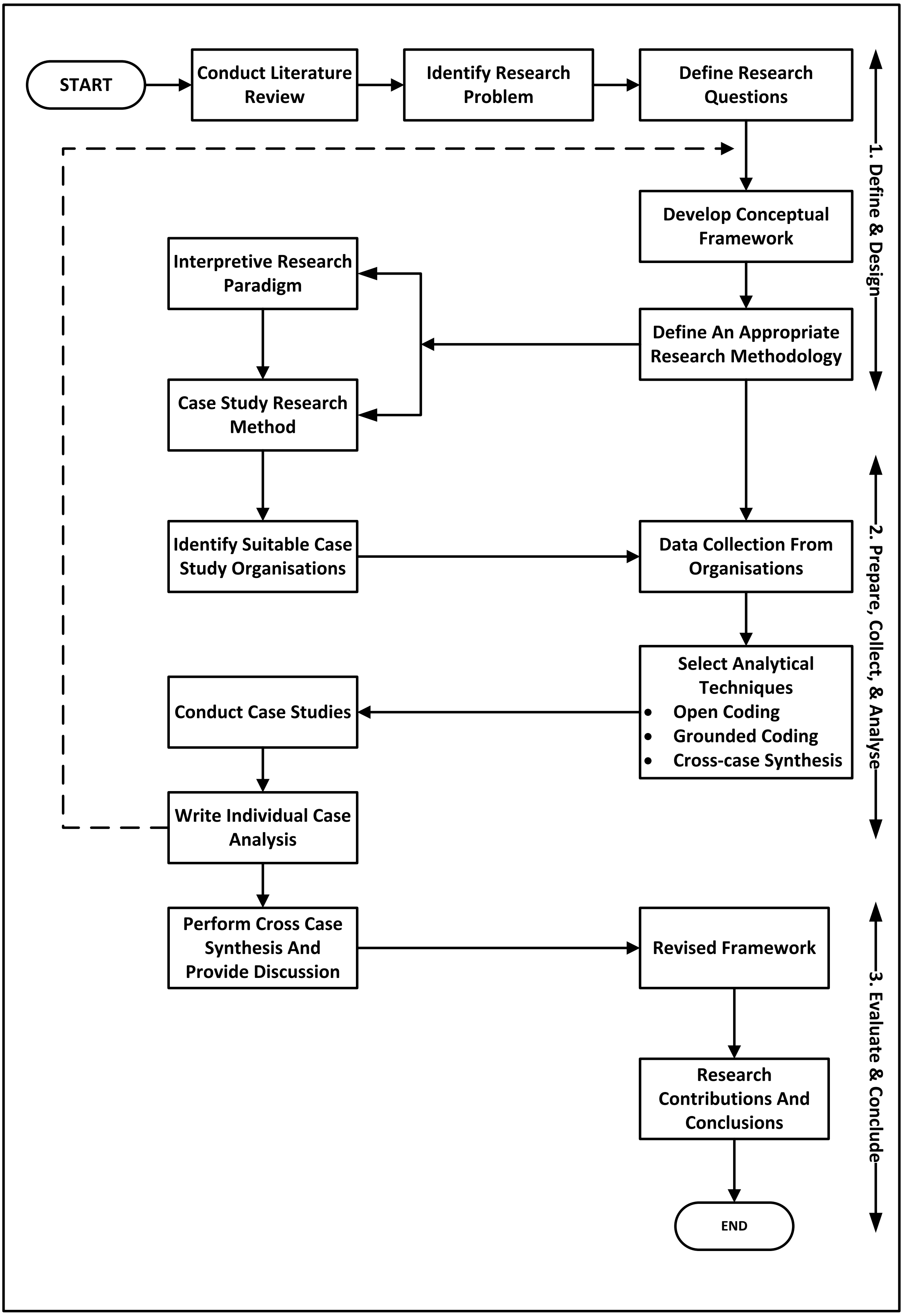

Figure 1.1: Research design

1.6 Structure of Thesis

The structure of the thesis can be described after the scope and objectives of the research have been determined and acknowledged. The structure of this dissertation is:

Chapter 1: Introduction: identifies the problem area of the thesis and proposes a solution. It defines lack of IT support for policy making process as a problem in the public policy domain and proposes a workflow system as a solution to achieve process efficiency. Aim and objectives of the research are presented to support further research.

Chapter 2: Literature review: The aim is to locate the gap in the existing literature; therefore the dissertation investigates the public policy making processes, existing models for policy making, the basic concept of the workflow model is reviewed and compared to organisation systems for comparison with the policy making process. Furthermore, existing IT adoption theory is investigated to select the background theory of the thesis. Lastly, research gaps are summarised along with the selected IT adoption theories for developing a workflow adoption framework.

Chapter 3: Conceptual framework: this chapter presents the initial workflow adoption framework, its concept and propositions of the research. The framework is based on the investigation carried out in chapter 2. Theories are identified which are appropriate for the workflow adoption framework that helps in building the focal theory of the research. Lastly, propositions are listed which are important for data collection in chapter 5. The aim of the propositions is not to validate prior findings or statistically test them but to gain a richer understanding of the policy makers' perception of the facilitating conditions and how they support workflow adoption.

Chapter 4: Research Methodology- Data theory: chapter 2 and 3 both presents background to the research problem and conceptual model. This indicates which research methodology should be selected. In chapter 4, the research design is presented to achieve the aim of the research that is to develop and evaluate a conceptual framework for workflow adoption in public policy making. The method proposed in this thesis is a case study method because there is a need to understand the research questions in section 1.4.

In order to find the answers to these questions, it is important to analyse the subject in its real environment. This allows an understanding of the meanings the subject associates with the phenomena rather than measuring their significance.

Chapter 5: Data Collection and Analysis: After designing the methodology of the study, data is collected from the unit of analysis. In this study from local borough councils 3 policy making institutes have been selected to evaluate the adoption of workflow technology for policy making processes. Hence, Chapter 5 provides background to the case studies, identifies facilitating conditions for workflow adoption and analysis of data collection.

Chapter 6: Revised framework: From the analysis of case studies in chapter 5, chapter 6 presents a revised workflow adoption framework for the policy making process.

Chapter 7: Conclusions- Novelty of the study: This chapter summarises the work presented in this thesis. Next, the novelty of the research is demonstrated along with the future recommendations.

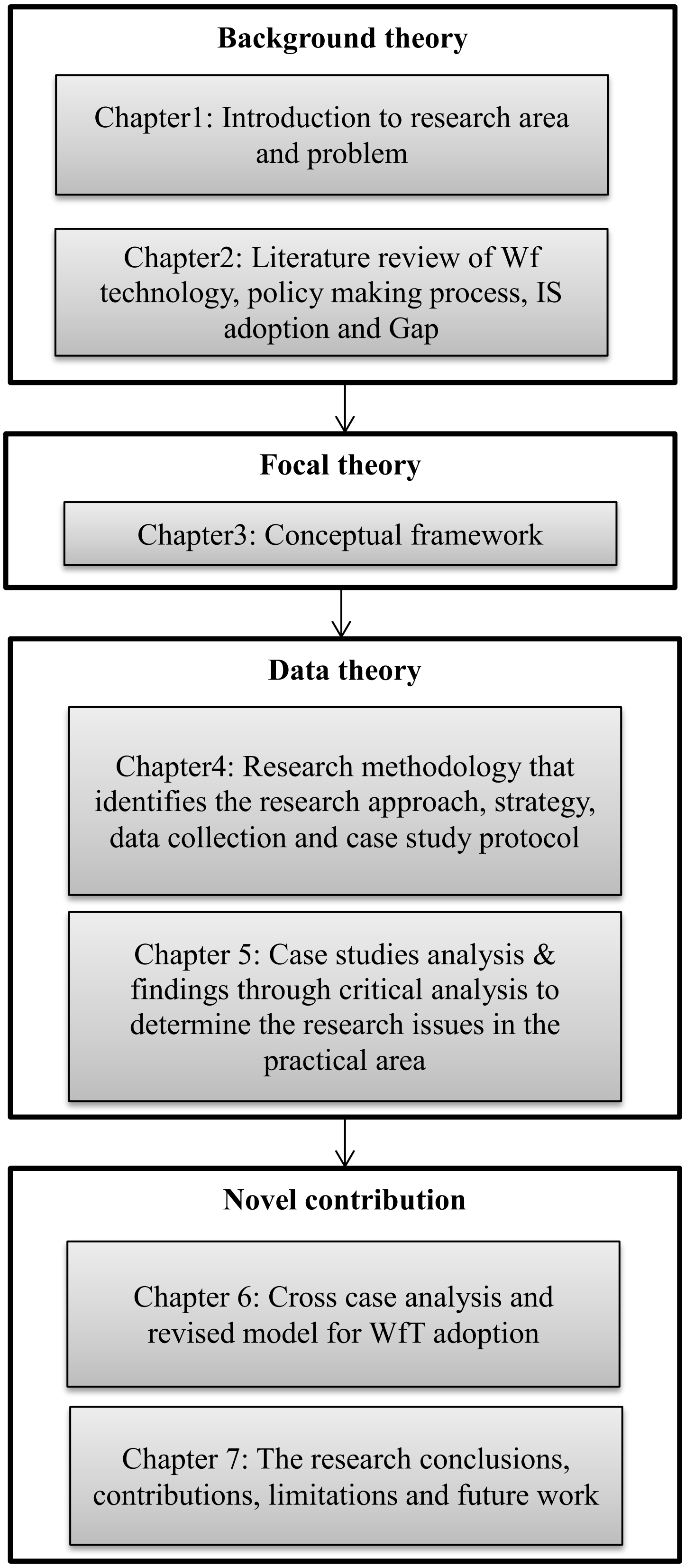

Figure 1.2: Structure of thesis

CHAPTER 2:THE LITERATURE REVIEW- CRITICAL ANALYSIS OF THE RESEARCH AREA

2.0 Introduction

The chapter investigates relevant literature to identify research gaps by critically reviewing literature on organisational business process, public policy making, workflow technology and IT adoption in IS and public administration. The review of this literature will also help in building a conceptual framework in the next chapter.

First, the chapter develops a thorough understanding of management business processes and presents a review of the policy making domain, policy making processes and public policy making frameworks. It also discusses their functional stance and drawbacks are highlighted. Following this, it leads to the identification of a generic process that can represent the policy formulation process in different settings. This discussion allows viewing the policy making process as a collection of processes, tasks, actors and information exchange which can be related to workflow definition. A contrast between business processes in the private sector and the public policy making process highlights the complexities to be found in the public policy domain and significance of workflow adoption. Therefore, to investigate how public processes can be enhanced, process modelling techniques are reviewed and a workflow method is selected because of its automation, rule resolution, coordination and collaboration benefits.

Secondly, an overview of workflow technology is presented that demonstrates various functions, benefits and applications. It further strengthens the proposition of workflow adoption in the policy making process and highlights significant gaps.

Thirdly, it evaluates IT adoption at the organisational level and identifies supporting IT adoption theory for developing the conceptual framework in next chapter.

Finally, gap analysis for this study is presented in section 2.7 and highlights the lack of TOE and TTF theories application for the adoption of workflow technology. It also helps in identifying potential factors of workflow technology adoption in section 3.2.

2.1 Business Management Processes

This thesis focuses on the management processes that handle, control, coordinate and communicate information within and outside the organisation. Management processes support organisations' operational processes that comprise an organisation's value chain. Management and operational processes are indivisible processes, hence business management processes are considered in this thesis for process enhancement through workflow technology adoption in the policy making context.

Organisations from the private and public sectors are faced with inevitable environmental forces such as increased competition, higher customer expectations and the proliferation of changing business environment that is altering the way businesses are conducted from how they were conducted in the past. To meet the demands of these external pressures, organisations have started to invest copious funds in information technology (IT) (Thong *et al*., 2000). IT has been adopted to boost business processes for better performance and greater output which conventional processes could not have achieved on their own (Davenport and Short 1990; Davenport 1993; Hammer 1990). Therefore, IT has become an indispensable tool for organisations that desire to reengineer business processes, revamp structures and improve process outputs. However, this requires an understanding of the business process across the organisation so as to optimize the IT.

2.1.1 Definition of business process

There are many definitions for business processes in the literature and this confusing profusion of definitions has created liberal use of the terminology (Childe *et al.*, 1994; Thomas *et al.*, 2002). For instance, among the disciplines processes are considered to be static activities for software engineers, commercial engineers see processes as links between activities and are seen among the service and production industries as distinct. Hollingsworth and Hampshire (1993) divide processes into manual process activities and workflow process activities. They have also been classified as informational, material and business process (Medina- Mora *et al*., 1993). According to Palmberg's (2009) literature review of 77 articles, there was no consensus on the definition of process.

Author	Definition	Commonality
Davenport and Short (1990)	Set of closely related tasks, which works together to achieve business goals.	Tasks
Scheer and Nuttgens (2000)	Processes are set of occurrences, which is initiated by an event and completed by another.	Series
Jacobson, et al. (1995)	“Set of internal activities performed to serve a customer”	Activities
Hammer and Champy (1993)	These are the activities that are somewhat linked to each other and work together to achieve business goals.	Goals
Hickman (1993)	“A logical series of dependent activities which use the resources of the organisation to create, or result in, an observable or measurable outcome, such as a product or service”.	Resources
Palmberg, 2009	“A horizontal sequence of activities that transforms an input (need) to an output (result) to meet the needs of a customer or stakeholder”	Transformation

Table 2.1: Definition of business process

The table 2.1 provides some of the definitions frequently quoted in the literature along with common factors among the definitions. These definitions are closely related to the essence of the study and they help in extracting a common definition for the purpose of this research. These definitions accentuate significant activities in a business process that suggest processes have a set of sequential tasks, using inputs to produce desired goals. On the other hand there exist some differences among the definitions such as Hammer and Champy (1993) who suggest activities are less linear, however, somehow related whereas others have emphasised sequential activities. Some of these definitions suggest business processes are a matter of input and output whereas others in the table 2.1, hold a goal oriented view describing them as a set of activities performed with an aim of achieving set goals. Each definition indicates an element in the definition of a process that can be extracted from definitions provided by other authors. This extraction of commonalities brings about a fair understanding of business process. However, for the purpose of this thesis, a process is defined as a series of tasks with activities performed by actors to achieve certain set goals.

2.1.2 Classification of Processes

Process classification allows managers and business owners to understand each process correctly, link together different processes in an organisation or segregate processes to allow manageability. Clear understanding of processes will lead to better utilization of IT and redesigning of processes to achieve efficiency (Davenport and Short, 1990). However, there are different categorizations of business processes found in literature (Childe *et al.*, 1994).

At the most generic level, processes can be classified as information, material or business processes (Medina- Mora *et al*., 1993). Childe *et al.*, (1994) categorized processes into three functions: Managing, Supporting and Operating. Amistead and Machin (1997) provide a framework for categorising processes that alternatively divide processes into Operational, Managerial, Direction setting and Support. However, among the different views provided in the literature on business process classifications, Davenport and Short (1990) classified business processes by dimensions of organisation and consideration of IT utilization. IT plays an important role in the design of the process as its utilization can eliminate some stages or direction of activity flow in the process.

Process dimension and Type	Typical example	Typical IT role
Entities Inter-organisational Inter-functional Inter-individual	Order from a supplier Develop a new product Approve a bank loan	Lower transaction cost; eliminate intermediaries Work across geography; greater simultaneity; Role and task integration
Objects Physical Informational	Manufacture a product Create a proposal	Increased outcome flexibility; process control Routing complex decisions
Activities Operational processes Managerial process	Product/Service delivery Procurement/Logistic Production Marketing Design and development Information handling Coordination Control Communication Decision making	Reduce time and costs Increase output quality Increase performance efficiency Improve analysis Increase participation

Table 2.2: Based on process classification (Davenport and Short, 1993: p 5)

Davernport and Short, (1993) divided Process dimensions into three categories (Entities, Objects and Activities) that have different types, which are matched with various organisation business natures. Organisation entities belong to inter-organisation process, inter-functional process or inter-individual process. They further suggest that organisations either produce physical or informational output and there are two types of activities going on in any organisation, operational and managerial. To extend the examples provided by the authors for the two activities, table 2.2 shows operational processes, which deal with the core of the business such as production, procurement, marketing etc. Managerial processes deal with the controlling, information handling, communication, decision making activities etc. Each type entails a function that can be linked to IT capabilities. Therefore, this type of classification allows this study to categorise processes, belonging to different businesses, and understanding the role of IT in process improvement efforts.

2.2 Policy Making As the Public Sector Business Process

Public policy making is a domain filled with contradictions, confusions and events causing erratic turns in policies. Decision makers are routinely faced with complex and conflicting objectives (Gerston, 2010). This confusion tends to highlight that in policy making processes, business policies and rules tend to change unexpectedly. During the policy making process a large degree of uncertainty arises which also influences the aims of the policy subject, thus demanding an efficient process and expert decision makers (Driessen *et al*., 2001). Major transformations are taking place among government organisations to meet these challenges and increased transparency, improved performance and to better involve citizens in decision making processes. These transformations are reengineering processes of the back-end and the front-end to achieve efficiency in office processes and provide citizens with a single point of entry via multiple channels (Chouribi *et al.*, 2009).

According to researchers a good policy results when a rigorous policy process is applied (Bridgman and Davis, 1998). The literature also highlights a trend of citizen participation in policy making processes to achieve a better quality of policy outcomes (Klijn *et al*., 1995; Kickert *et al*., 1997). However, effective collaboration between the participants and decision makers in the policy making process (PMP) lags behind expectations. The policy making process is thus perceived as being a highly mechanistic system that necessitates improvements in systemic communications and co-ordination, e.g. wiring-up and joining-up (Lee *et al*., 2010; Lindblom, 1959). This perception implies that policy makers have to be trained in the right skills and provided with the right mechanisms (Parsons, 2002). It also highlights the importance of IT adoption to expedite effectiveness in government processes and better output. An advanced process design and IT as a tool that can integrate citizens' opinion in policy making process are required.

Several models dealing with policy making processes have been developed, e.g.: (a) Model for Participatory Decision-Making Process (Renn *et al*., 1993), (b) Hofferbert's Model for Comparative Study of Policy Formation (Mazmanian and Sabatier, 1980), (c) The Linear Model (Grindle and Thomas, 1990), (d) A Conceptual Model for the Analysis of Policy making Process (Uslaner and Weber, 1975), (e) Advocacy coalition framework (ACF) (Sabatier and Jenkins, 1988), (f) Bureaucratic politics framework (BPF) (Moe, 1990), (g) Institutional analysis and development framework (IADF) (an instrumental rational choice framework, Ostrom, 1999) etc., have been proposed and theorised in the normative literature. These models have been developed to generate better policies; however, they shed no light on the optimization of processes involved. The goal of the policy making process should be to explain how interestedly political actors interact within political institutions to produce, evaluate, implement and revise public policies (Schlager and Blomquist, 1996, p: 653) which requires efficacious collaboration, coordination and linking the right activities together to achieve policy goals.

2.2.1 Definition of public policies

A growing body of literature within political science, international and national political studies, directly or indirectly uses, discusses and analyses the processes involved in public policy decision making processes (Renn *et al*., 1993 and Sutton, 1999). However, due to the complex nature of public policies, there are many definitions in the literature attempting to comprehensively cover the matter and its precise definition that has, so far, eluded a single definition.

Author	Definition	Focal points	Shared Denominator
Cochran *et al*. (1999)	Public policy as the outcome of struggle within the government over who gets what.	Collaborative allocation of policies	Decision making
Crochran and Malone (1995)	Political decisions to achieve societal goals	Goal orientation	
Thomas (1992)	Whatever government chooses to do and not to do.	Political activities	Rules and Regulations
Birkland (2011)	A statement describing what government intends to do and not do in terms of law, regulations, ruling and decisions or combination of these.	Collection of dominating actions	
Peters (1995)	Public policy is the sum of public activities whether acting directly or through agents, as it has an influence on the life of citizens.	Government activities affecting citizens	

Table 2.3: Definition of public policy

The table 2.3 describes various definitions in the literature of public policy and what is found to be common understanding among the various definitions. Nevertheless, all the definitions indicate the same aspect of public policy making, which is that they are made for the public, and affect a wide variety of people and their interest. For the purpose of this study public policy has been defined as set of rules governing what actions are allowed and not allowed on the part of the people.

2.2.2 Distinguishing processes in private business and policy making domain

Private sector organisations have fundamental differences in the characteristics of their business processes, structure and business environment from government organisations (Thong *et al*., 2000; Bozeman, 1988; Bretschneider, 1990). Kathy et al., (1990) compared eight characteristics (organisational values, goals, incentives, organisational structure, raw materials, power-dependency relationships, technology, revenues and accountability, and environmental constraint) of private and public organisations and found significant differences. Since the study advocates process performance improvements through workflow technology adoption, only the major differences between the private and public organisations' business processes have been highlighted. Table 2.4 below exhibits a contrast of process dimensions between private business and public policy making processes

Dimension	Private business process (PBP)	Public policy making process (PPMP)
Task completion	Shorter	Longer
Task specification	Straightforward	Sophisticated
Role resolution	Simple	Complex
Tracking service	Manageable	Complicated
Number of Actors	Small	Large

Table 2.4: Process attributes comparison of private and public processes

Business processes in the private sector differ from the policy making process of the public sector. Firstly, the completion of the task in PPMP has a longer duration due to the large number of citizens involved compared to private business processes where tasks are assigned to one or more actors. The status of a task in BPB is simple, after allocation to the actor it changes from ‘assigned’ to ‘completed’ on its completion. However, in PPMP the large number of citizens involved creates complications for status updates. For example, the status of the task can be changed when pre-defined conditions are met. One simple example of such tasks is “Public consultation for submission of Development Planning Document (DPD) and sustainability appraisal report” which is one of the tasks of “the Urban Planning: Land Use” process of the South Yorkshire County Council in the UK. The task requires obtaining feedback from a large number of citizens and/or groups on a DPD and the completion of the task is determined depending on the number of citizens (or groups) involved in the task and the quality of the feedback received, that is need to filter out any noises like commercial advertisement or irrelevant input.

Secondly, the specification of task information requires more sophisticated attributes than a PBP task, as the duration of the task is longer and there are conditions to complete the task that needs to be defined (Lee *et al*., 2011).

Thirdly, the role resolution in PPMPs is not as straightforward as in PBPs. Generally in private business a task instance is allocated to a particular role or a team in an organisation. Any actor that qualifies for the role will be able to execute the task instantly. However, in PMP task instances that require large citizen involvement will have to allow as many citizens with different roles as can be involved in the task execution.

Fourthly, in a business process, a tracking service is used to inform whoever executes the task and what the results obtained were (Lee *et al.*, 2011). The tracking service for PMP is difficult due to the large number of citizens involved in the task completion. As the tracking service needs to provide information about a large pool of citizens, who provided that input, the collective results have an impact on the final decision. Moreover, in PPMP where citizen involvement is not restricted to one task, a tracking service needs to link information between two or more tasks, for example, citizen feedback on agenda setting or collection of citizen feedback on a proposed policy draft.

Equating process attributes with business processes in private sector and public policy making processes highlight significant complexity in the processes of public policy formulation and the need for greater technological sophistication. The contrast provides a clear understanding of a need to better design processes in public policy making. The redesign of processes and IT cooperation can both enhance productivity of the process. A greater number of participants in policy making processes make assigning roles to perform tasks or to participate in opinion contribution demand a stronger role resolution mechanism, if automation has to be used. Workflow technology is one of the solutions to these issues that allow better coordination, systematic distribution of tasks and role allocation and automation of processes to achieve process efficiency.

2.2.3 Theoretical approaches to public policy making process

In practice, there are large numbers of public issues, which fall outside the capacity of decision makers to process them (Cobb *et al*., 1976). Moreover, with the advancement in society and industry there are numerous issues emerging with comparatively fewer resources, making policy formulation even more complicated. These issues cause uncertainties to take place during the policy making process. A policy making process must comprise of a mechanism which allows various issues or their proponents to be taken into account by the decision makers and efficient handling of the uncertainties which arise. Just as the cooperation between the government and firms can help in producing correct policies (Chappin *et al*., 2008), citizen participation in policy making processes can generate policies better matching public issues. However, exploration of existing frameworks and models of policy formulation shows a lack of systematic processes that can accommodate these issues efficiently. Also, it demonstrates a lack of mechanisms that can integrate citizen participation in policy making processes in a systematic manner. However, different approaches to policy formulation show the existence of processes, actors, tasks and activities which allow technologies such as workflow to be deployed for automation, increased process efficiency and better performance. Exploitation of IT in the public sector has enhanced operational performance (Kraemer, 1993 and Kumar *et al*., 2007) but the quality of service output and customer satisfaction nonetheless requires business process reengineering. The emergence of mobile technology has opened unprecedented opportunities for the public sector to serve citizens anytime and anywhere through portable devices (Townsend, 2002 and Foley, 2004). The introduction of portable electronic devices and location-based services has eliminated time, location and access constraints serving mass to minority markets (Becker and Durr, 2005). To tap into these opportunities, the policy making processes must be flexible for automation, support tracking services and hold transactional and geographical capabilities.

2.2.3.1 Evaluation of public policy theoretical frameworks

Theoretical approaches to policy making are in abundance and are diverse (Birkland, 2005 and Hill, 1997). Keeping interest among political scientists and policy scholars, models like ‘Open systems framework of Richard Hofferbert, (1974), institutional rational approach (Kiser and Osterm, 1982), policy stream approach (Kingdon, 1984) and advocacy coalition (Sabatier, 1991), have been most cited in the literature. These models have catered to the needs of policy making, whereas citizen participation is not taken into consideration, therefore, leaving no room for participation and limiting the full potential of processes in policy making.

Framework	Focus	Limitation	Author
Open systems framework	Impact of environmental forces	May overstate the role of elites.	Richard Hofferbert (1974)
Institutional rational choice	Institutional arrangements for decision making	Policies can be resulted out of conflicts	Kiser and Osterm (1982); Osterm (2007b);
Multiple streams approach	Policies are outcome of problem, policy and political streams	Policies are dependent on finding the right problem to match policy idea.	Kingdon (1984)
Advocacy coalition	Coalitions are formed around issues and effect policy change	Policy quality depends on homogeneity in the coalition	Sabatier (1991); (2007); Sabatier and Smith (1993)
Policy diffusion framework	Movement of policies across governments	Lack of mechanism to explain diffusion and adoption of policies	Berry and Berry (1999; 2007); Nowlin (2011)
Synthetic explanatory framework	Combination of existing frameworks	Lack of specialization	Real-Dato (2009)
Narrative policy framework	How policies are interpreted and transmitted by elite and public	More belief oriented than problem focused	Jones and McBeth, (2010)

Table 2.5: Evaluation of public policy theoretical frameworks

Table 2.5 seeks to show some of the concepts of policy making and how decisions are made and influenced. The evaluation demonstrates that mass citizen’s opinion is not integrated in the policy formulation process but policies are the result of discussions within the government bodies. These frameworks may help in producing public policies but do not enhance the entire process of policy formulation. Decisions can be taken via different approaches as mentioned in the table 2.5, but a framework is required to enhance the process that will effectively allow citizens to raise issues and participate in the policy making process. Moreover, these frameworks come with some limitations that highlight influences in the decisions. An affective framework should allow decision making with the public and policy makers’ mutual understanding of the issues. Policies are made to govern citizens’ life in a society and solve citizen issues, therefore citizen input in the policy making process is vital for successful policies.

2.2.3.2 Overview of mostly cited Public policy framework

The open systems framework (Hofferbert, 1974) puts policy output as a dependent variable that is affected directly or indirectly by historic geographical conditions, socio-economic composition, mass political behaviour, governmental institutions and elite behaviour. This approach has been used for cross-sectional comparisons for policy decisions (Sabatier, 1991). However, a number of researchers have argued that its limitations of inter-government dimension, lack of policy effects and feedback for longitudinal studies and some conflicts between government institutes and elite behaviour have an effect on policy decisions (Sabatier, 1991; and Cobb *et al.*, 1976).

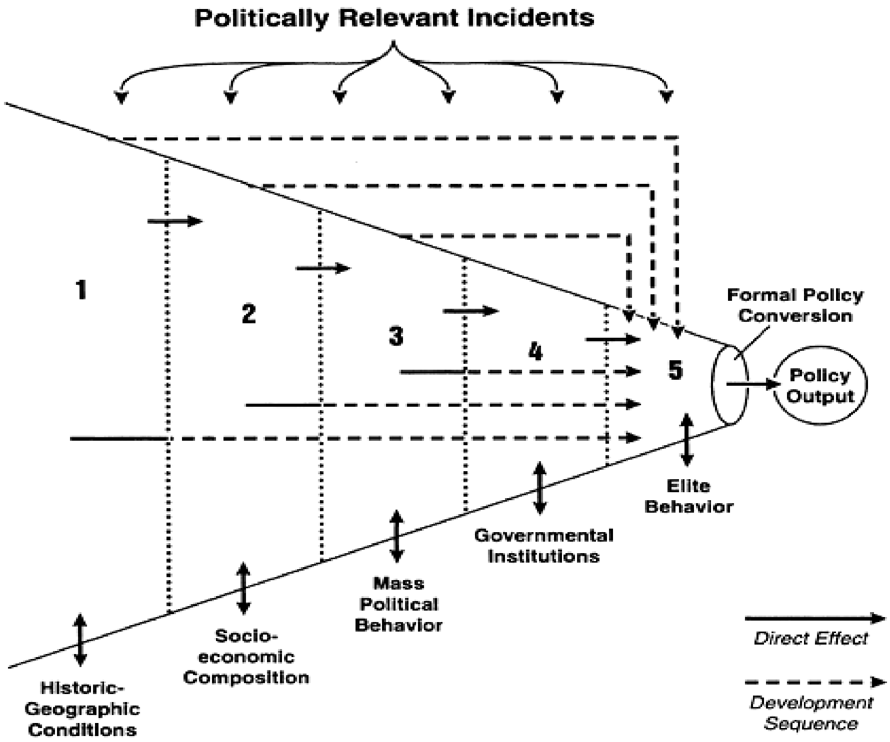

Figure 2.1: Hofferbert Open-system framework (1974)

The Institutional Rational Choice theory suggests that policies are made by institutional arrangements and the actions of citizens or public officials which are permitted, forbidden or required are decided by these institutions (Schlager and Blomquist, 1996; Osterm, 2007b). The framework explains three levels of institutional arrangement: the constitutional level, where the legislatures are governed by constitutions; the collective choice, in which agencies are governed by legislative act, and the operational level, where agencies distribute the policy outcomes (Sabatier, 1991). The top level directly sets rules for the lower level and the final decision affecting the citizens or the public officials by the operational level. However, Sabatier (1991) has found some limitations in the model. He suggests that the model neglects the crucial factors that affect the relationship between the societal effects and policy decisions. Also, focusing on individual institutions makes the multitude of institutions in policy communities unmanageable.

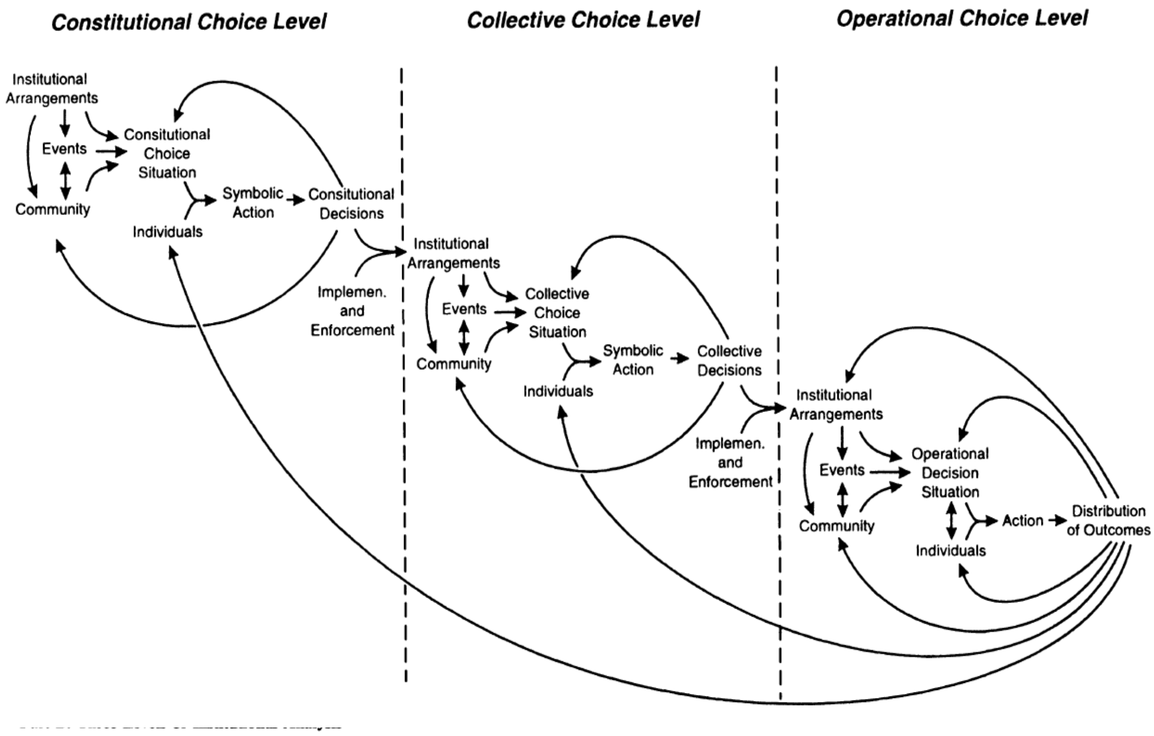

Figure 2.2: Institutional Rational Choice (Kiser and Osterm, 1982)

John Kingdon (1984) has come up with a new approach for policy making processes by dividing them into the problem stream (the process of generating problems which needs policy makers attention), the policy stream (generation of policy ideas and proposals) and the political stream (the outcome of elections, legislative leadership contest etc.), suggesting that the policy making process does not exist in sequential stages. However, the three streams converge at critical times, whereby solutions become joined to problems and both of them are joined to favourable political forces (Kingdon, 1995, p: 20). Opportunities for promoting certain proposals or political ideas, which are also known as window of opportunity, are developed when the political stream sees developments (Jones and Newburn, 2005). The model has many benefits but it also has few weak points that need research attention. According to Sabatier and Jenkins (1988) there is too much distance between the policy stream and the political stream. Also, if the framework has to address the entire policy making process, then formulation and implementation needs further attention (Sabatier, 1991). The model does not have stages or steps and there exists no priorities among the streams.

Lastly, Advocacy Coalition Framework by Sabatier and Jenkins (1988) differentiates itself from other models on the basis of a time and policy subsystem. The framework includes a number of major actors and variables, which create an impact on policy change over a period of a decade or more. Schlager and Blomquist, (1996) highlights three main functions of the framework: (1) interaction between advocacy coalitions in subsets (2) external changes (3) the effects of stable systems such as constitutional rules, legislative set etc. However, the model is dependent on long time periods for policy changes, which complicates changes in short periods. The variable arrangements and their complex relationships make the process more difficult to execute efficiently. Lastly, Sabatier and Jenkins (1988) also identified the absence of the actor’s interest in the policy making process and instead it’s based on believe system majorly.

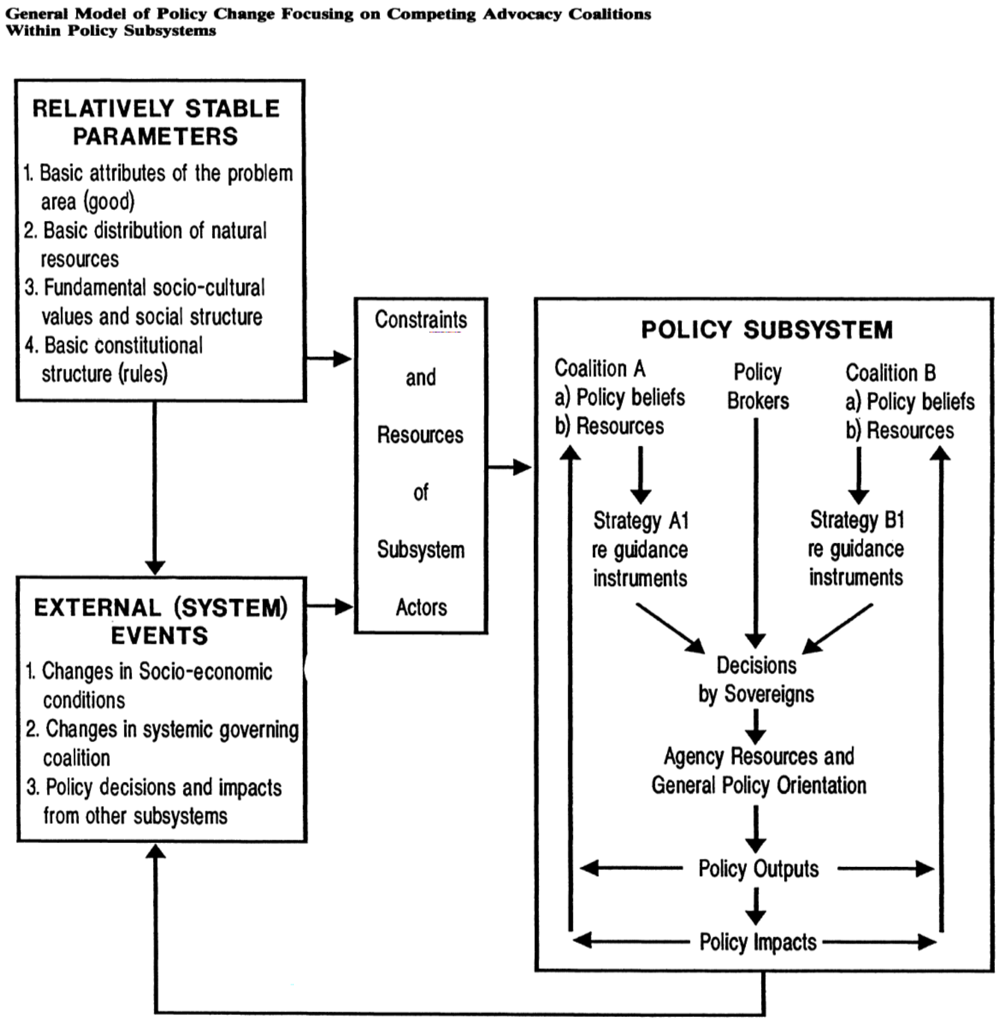

Figure 2.3: Advocacy coalition model (Sabatier, 1991)

Political science and policy studies have contributed efforts to direct decision makers in formulating public policies with varied approaches. Colebatch (2006, p: 224) views policy as a complex system and an intersection of diverse agendas, not a collective attempt to accomplish known goals. Policy development is an exercise in social construction with policy work concerned with the construction of meaning. This approach suggests that issues arise from within or outside the government, which interact in a variety of ways to produce a policy. Moore (1997) views policy making through a value adding approach where the policy world is organized according to the public's values, where actors are encouraged to come up with new ideas to improve organisations and services using a value adding concept. These public values are judged by the government and are not the outcome of public participation with their suggestions and opinions in PMP. The risk uncertainty management approach of Boin *et al.* (2005) and Perrow (1984) views policy making as managing risk, crisis and un-certainty at all levels where there are threats or opportunities, process disorder and urgency. It sees policy formulation in an innovative environment when reacting to an on-going crises and risks. Additionally, there is the rational approach, which is based on a sequential order of policy making process. Policy making begins when an actor identifies a problem, sets goals, carefully identifies alternative means and selects among them the best option based on his calculations (Etzioni, 1967). It suggests, providing policy makers with enough possible policy options that they reach certainty. On the other hand, muddling through and an instrumentalism approach take small incremental steps towards policy change. In this way policy making is seen as a reform process with decision makers taking modest and regular decisions rather than sudden and dramatic ones. It assumes much less command on the environment than the rationalistic approach where decision makers are seen to posit a much higher degree of control over decision making (Lindblom, 1959). However, these approaches cannot be adopted as generic strategies for policy formulation. Moreover, the advent of a new era where public participation is taking place rigorously in the government sector prohibits public participation.

2.2.3.3 Models of public policy making process

A suitable model for policy making process should be able to identify important elements, their relationships and the flow of the process. It is an iterative process that is constantly producing an improved set of policies and a design, which can be applied to various institutional settings. According to Ostrom (1999) a list of variables, which can identify most relevant and general elements in the policy making process can be used for different institutional settings. Sabatier and Jenkins (1988) have outlined a merit for selecting a framework for policy analysis. Firstly, it should be broad in scope, hypothetically verifiable and can identify causal drivers. Secondly, it should rationally explain the policy process. Lastly, the framework should address the traditional factors important to political scientists.

Model	Focus	Attributes	Author
A policy process approach	Policy as an outcome of complex process	Activities, Actors, start and end stages	Burch and Wood, (1989)
Australian policy cycle	Policy formulation as a result of policy cycle	Stages, coordination of activities, process iteration	Bridgman and Davis (2000)
Policy making cycle	Policy are made through high level stages	Process oriented, activities, stages, coordination, monitoring	Macintosh (2004)

Table 2.6: Models of public policy making processes

Table 2.6 highlights that the policy making process is comprised of steps, activities being performed by actors and there is a need for coordination and monitoring. This study considers Macintosh's policy making cycle as the most suitable process that consists of the important tasks and processes existing in most of the policy making process models. These stages allow policy makers to benefit from process automation functions, with the help of IT, from the start till the end of the process. Also, if not all the stages then most of the stages open up for citizens to participate in policy making for a conflict free, cohesive and effective policy output. Smith and Linder (2010) suggests that citizen participation takes place on the input side and as actual decision making, therefore, agenda setting and policy creation are open doors for public participation in PMP.

Policy development describes a process with several sub processes and its application can be seen as a policy cycle (Neilson, 2001). According to Chappin *et al*. (2008) sub processes can exist at the same time or even skipped, however, a standard form of policy cycle has five stages; agenda setting, policy formulation, adoption, implementation and evaluation. In the literature a policy cycle is defined as a tool used to analyse the development of a policy team. The policy cycle approach sees the government as a process and not as institutions (Birkland, 2005). It suggests an iterative process of policy formulation, evaluation and implementation with a few unique stages. It provides progress of information, ideas and resources from one stage to another and does not finish at the decision stage, however carrying through implementation and evaluation. By analysing the complex processes and issues into manageable stages it allows focusing and catering to the needs of each stage efficiently. As suggested by Howard (2005, p: 3), the "policy cycle has the potential to capture some of the fundamental features of current policy formulation, including the existence of numerous decision makers, the high degree of competition and contestability among sources of policy advice, and the substantial impact of previous policies on new efforts”. It is normative in nature, suggesting appropriate sequences to approach a task. The characteristics of a cyclical approach recognize policy making as a linear approach and entail more fluidity in the process. Moreover, it describes each stage in the policy making process, their relationships and creates a sense of policy development (Birkland, 2011).

2.2.3.4 Overview of policy making process models

A process oriented policy making approach like Burch and Wood’s (1989) policy making process and Edward’s policy development model where policy content is the outcome of a complex process (Edward, 2001, p: 4). According to Edwards (2001) and Bridgman and Davis (1998), a good policy process ends up producing good policies. Policy making processes can be explained in many ways with various

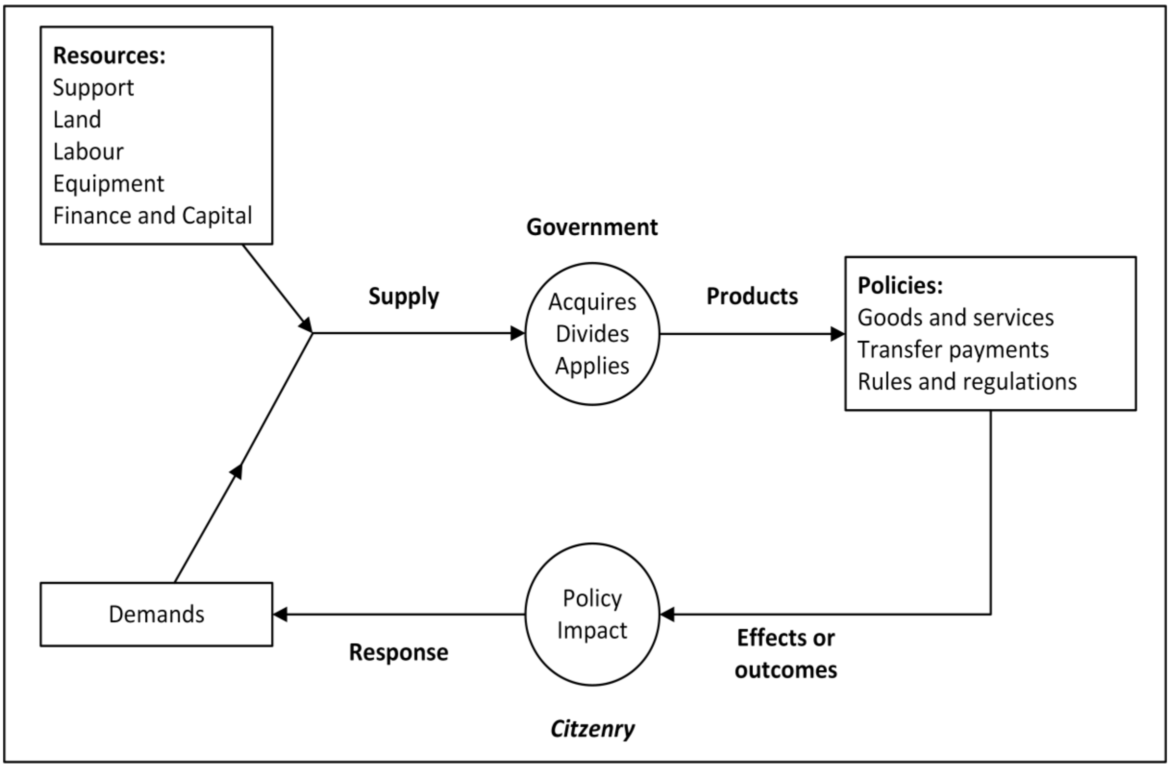

Figure 2.4 A policy process approach (Burch and Wood, 1989)

starting and ending stages, incorporating sub-processes carrying out activities. Likewise, the Australian policy cycle starts by identifying issues and moves to policy analysis, policy instrument, policy consultation, coordination, decision, implementation and evaluation stages. In the process cycle, during the last stage, policies are evaluated and if they do not show coherence and relevance with initial submissions then they go back to the process. This way policies are being formulated, corrected and new ones added form the iterative policy making process.

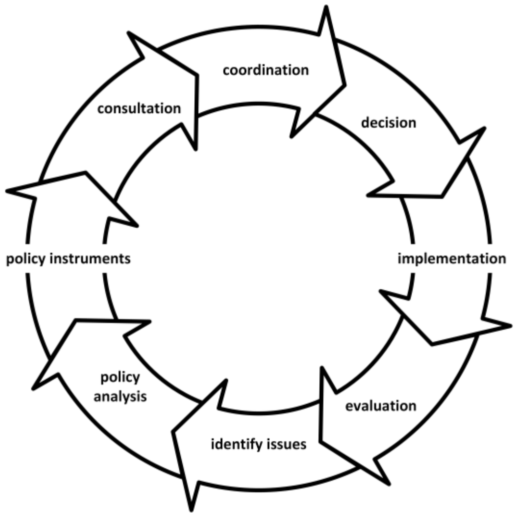

Figure 2.5: The Australian Policy Cycle (Bridgman and Davis 2000, p: 27)

However, it does not integrate citizen participation and the government officials identify issues on behalf of the citizens and without looking at public opinion. Hence, policies tend to be produced which are removed from what the citizens perceive to be the actual issues and the issues that are considered by them as important can be ignored. As policies are made for the citizens that affect their daily lives therefore integrating citizen participation in identifying issues and policy making is deemed to be vital. Also, the consultation stage in the process only allows government departments or external agencies to generate ideas, analyse proposals and make changes to contribute to final solutions. Whereas citizen participation will provide a constant feedback on the identification of issues keeping citizen preferences and interests, and the development of coherent solutions. Additionally, Howard (2005) argues that the model cannot be interpreted as a generic convention that can represent progress of policy processes in different settings.

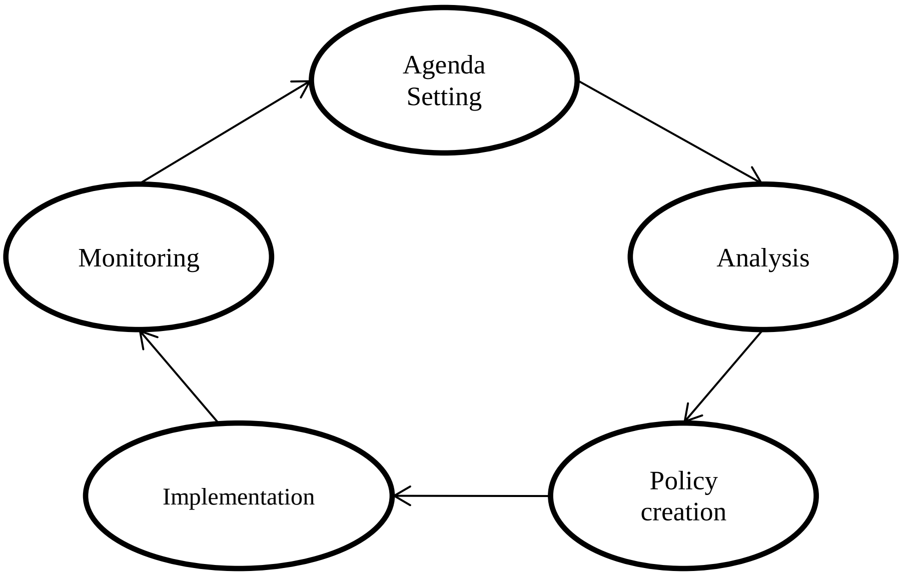

Figure 2.6: Policy making cycle (Macintosh, 2004).

The stages in the policy making process proposed by Macintosh (2004) can be considered as a generic policy cycle model. The reason for this is that these stages draw upon a key dimension of when to engage citizens in the policy making process. Also it depicts the most straightforward process where variables are organized for understanding intricate arrangements and complex relationships. To establish a framework that discusses where Information and Communication Technologies (ICTs) are most appropriate in the policy making process, Macintosh (2004) illustrates the need to describe the policy making processes through 5 high-level stages involved in the policy cycle: agenda setting, analysis, creating the policy, implementing the policy and monitoring the policy. These stages are much identical to the stages defined by Starratt, (1988) of a conventional paradigm of policy making process.

2.2.4 Participation in policy making process

According to OECD (2002 b) participation in policy making process is important, as the barriers to integration are the conflicts taking place between the stakeholders' perceptions. Stakeholder participation leads to a reduction in conflict, constructive discussions, encourages multi-sector partnerships and supports policy making in a fair, transparent and effective fashion. The integrated participatory policy making surpasses the traditional top down approach and bottom up approach where the former suggests relying on officials doing their job more efficiently and the later acknowledges contingency that adopts the perspective of those who will be affected most by it (Howlett and Ramesh, 2003). It is suggested that participation in the policy making process by the citizens will improve the quality and enhance efficiency. Also, it will reduce conflicts, produce more constructive discussions, forward thinking, strategic and discursive processes. The literature suggests, when citizens are involved in the decision making process, they are more supportive and motivated (Potapchuk, 1996). There is a trend in the public sector where policy content orientation is moving to participatory orientation which is demanding robust processes capable of effectively involving public participation in PMP (Klijn *et al*., 1995 and Kickert *et al*., 1997). The Netherlands is a good example that focuses on participatory processes for policy formulation rather than traditional PMPs. Such an approach allows actors, issues and solutions to interact and form appropriate policies (Edelenbos, 1999). The government has to develop a PMP that can accommodate large number of participants who are being affected by the policy plan (DeLeon, 1992), and allows them to interact at an early stage so that objectives can be well defined and policy content can be discussed. However, participation is not restricted to the initial stages but their feedback is pivotal during sub-processes for the formulation of coherent and appropriate policy

Traditionally, citizens were invited to participate in government democratic affairs via town meetings, publications, surveys, focus groups, target briefings, toll free phone-lines, interviews (Howard, 1998) etc., for direct feedback. This confrontational atmosphere gives advantage to those individuals who are more vocal in public and therefore to collect a wide range of citizen opinion, that would involve diverse groups, is not properly achieved. Moreover, because of limitations of time, space and access to information, citizens are less motivated to participate (Kingston et. al, 2000).

With proliferation of IT, many methods have evolved superfluous opportunities for citizen participation in decision making. Practitioners and researchers have been trying to invent different methods to increase two-way public participation and improve low citizen participation (Abelson *et al*., 2003). They consider public participation as a vital ingredient for effective decision making (Pratchett, 1999; Rowe and Frewer, 2000).

E-government is shifting to m-government (mobile government) due to advances in mobile telecommunication services, technological infrastructure, and high demand for service quality and desire for anytime-anywhere options that are led by mobile phone technology (Kushchu and Kuscu, 2003; Heeks, 2006). Mobile government or m-government means providing government services using wireless technologies (Ghyasi and Kushchu, 2004). Mobile application (m-application) is the next generation and provides rich interactive applications. This technology is evolving with a considerable speed, enabling m-commerce and opportunities for location based applications (Sadeh, 2002).

Advancement in technology and external factors are driving the policy making process to constantly keep abreast of the latest developments. Lack of transparency and tracking services create less participation (Venkatesh and Morris, 2000; Carver *et al*., 2001 and Macintosh, 2004). Workflow technology holds many benefits in its implementation however, it has not been used to exploit citizens' involvement in the policy making processes.

2.3 Business Process Modelling Methods

Business process modelling is a technique to achieve process productivity, a mechanism to evaluate and improve existing designs of business processes. It is the abstraction of an organisation's business process that can be used to automate entire or partial processes. The benefits of business process modelling have spurred a superfluity of literature on different methods of modelling business processes, which makes it perplexing to practitioners who want to adopt the right method for their business process (Auguilar-Saven, 2004). However, before modelling any process it is important to understand the aim behind the development of the process. Why a process is needed, what purpose it will serve and how it should serve, are some of the questions clarifying the purpose behind the process development. As each organisation has different business goals, their processes are defined differently.

According to Curtis *et al*. (1992), there are four perspectives in modelling a business process which are functional, organisational, behavioural and informational. These perspectives can be found in any business environment and the modelling of a business process ultimately serves broadly these segments. Lin *et al.* (2001) further extends these perspectives to incorporate verification/validation and modelling procedures in a framework to select a process modelling method. It evaluates strengths and components of different modelling techniques that allow the selection of an appropriate model in accordance with the six perspectives. Auguilar-Saven (2004) classifies different modelling techniques in the literature and highlights each technique's strengths and weaknesses from the user's and modeller's perspective. Among the techniques classified, workflow is the most appropriate method for process automation. In the policy making process, where the flow of information is high and uncertainties exist due to the political environment, procedural rule attributes of workflow makes it one of the best techniques for modelling a policy making process. The flow of tasks between people and computers also opens an opportunity gate for electronic participation and mobile participation in policy making. Moreover, the ease of analysing processes and learning time does not require special technical expertise from the policy makers who are not so technical.

2.4 Workflow Technology

From the early to mid-1990s, WFMSs received significant consideration from industrial practitioners as well as the academic research community interested in the technical aspects of WFMSs (Aalst and Hee, 2002; Lee *et al*., 1999). WFMSs are computer systems that manage and define a chronological succession of work related operational activities or a multifaceted set of processes each taking place in sync, eventually impacting each other according to a set of regulations, directions, and roles resulting in fabricating final outcomes (Sell and Braun, 2009). More simply, WfMS is computer software that manages and automates the process of transiting required information, documents, and tasks from one organisational employee, or machine, to another (Wescott, 2001; Wang *et al*., 2006). There are many systems to support workflow management in the commercial context such as IBM FlowMark, Action Workflow and InConcert. A comprehensive review of commercial WFMSs can be found in (Georgakopoulos *et al*., 1995 and Silver, 1995). Debenham (1998) highlights that using the WfMS is a modern trend in the modelling and implementation of an information flow and business processes in an organisation.

This review indicates that WfMS facilitate the classification of dissimilar workflows for different types of tasks or processes, moreover, automating necessary tasks and making certain that unfinished tasks are followed up (Wescott, 2001). The automation of business processes (in the works of Aalst and Hee (2002) termed as ‘workflow’) enhances the overall operational activities at all levels in an organisational setting (Sell and Braun, 2009).

Workflow is a technique that abstracts organisational processes and defines them into computer readable formats that can be turned from manual business process into automated processes. It comprises of set of tasks performed by actors with different roles in a certain sequence (Ellis, 1999). To better understand the concept of workflow, Aguilar-Saven (2004) presented a flow diagram, which describes the stages and elements in the workflow process. Business processes are abstracted and defined in process definitions (workflow model), which contain activities of the business process that can be performed either manually or automatically. Workflow management system (software) is responsible for executing the process, which implies that it controls process instances based on the process definition provided. Process instance is actually a single case (e.g., an insurance claim, a tax declaration, a customer complaint, a mortgage, customer order placement for equipment) that holds single to multiple automated activity instances. These activities can either be a task or initialization of associated applications.

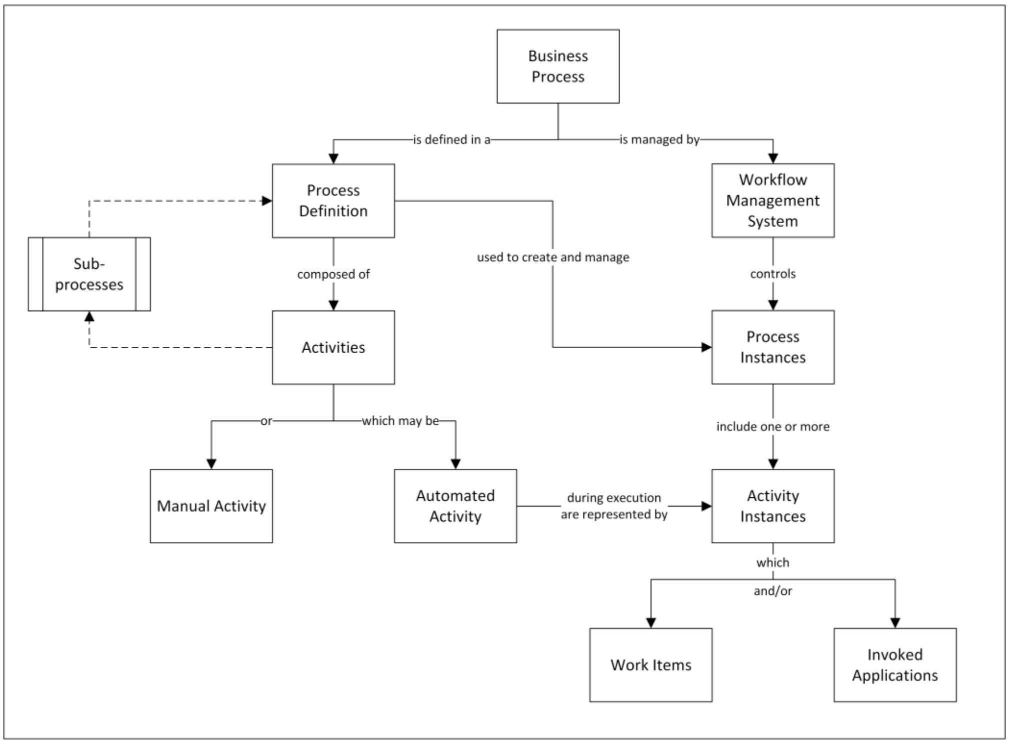

Figure 2.7: Concepts of workflow (Aguilar-Saven, 2004)

There is more or less the same structure found in the definition of workflow technology. Most of the definitions focus on process automation, sequential task execution, description of task dependencies and flow of information according to rules and conditions. Workflow is defined in this thesis as description of a business process that is either completely or partially automated.

Author	Definition	Focus
Zhuge (2002); Zhuge *et al*. (2001); Zhuge *et al*. (2002)	A workflow is complete or partial automation of a business process	Automation
Georgakopoulos and Hornick (1995)	Workflow is defined as a mechanism for controlling and coordinating execution of tasks.	Sequential task execution
Wang *et al*. (2006: 789)	"Workflow model is a set of concepts describing processes, tasks, roles and dependencies among the tasks".	Abstraction of connected tasks
Stohr and Zhao (2001: 282)	"A workflow is the automation of a business process in whole or in part, during which documents, information or tasks are passed from one participant to another according to a set of procedural rules".	Rule based information transitions

Table 2.7: Definitions of workflow

Wf technology has been widely considered and accepted in the private sector to support the efficient and effective collaboration of actors involved in a business process. In particular, the automatic routing and role resolution functionality of WfT simplify the complexity with regard to who is supposed to do which task and function in which context. Actors involved in a business process are automatically provided with all the documents and context information for executing a given task. The functionality of WfT is also considered as a core tool to enable citizens who are one of the core participants of PMPs to be engaged with any relevant PMPs. According to Greasley (2006), to accelerate process time WfMS software can be utilized that eliminates repeated and unnecessary tasks from the business process and an automation function saves time and resources (reduced human handling). A policy making process that is process oriented, with the support of a workflow mechanism shows strong potential in enhancing participation between the different actors in the policy making process.

2.4.1 Workflow classification

One of the core components of WfMS is a workflow model that characteristically includes a set of perceptions that are constructive to illustrate processes, their tasks, dependencies among tasks, and the required roles (i.e. skills of the individuals or information systems) that can perform the specified tasks. More simply, workflow models represent real world business processes.

Workflow is famously classified as Ad hoc workflows, Administrative workflows, Production workflows and Collaborative Workflows (Ader, 1997). These types can be found in commercial and public WfMS's. Production workflows generally entail small variations and, hence, are repetitive processes. Compared to the administrative type, it requires sophisticated information for automated decision making (Georgakopoulos and Hornick, 1995). Administrative workflows are also repetitive processes but the levels of information is simple and to a large extent are concerned with routing information within the office environment. The collaborative type, as the name suggests, is concerned with providing support for other processes. It is simple in nature, does not require complex information for routing information and plays an important role in decision making for the other processes. Ad hoc workflows are unique as they evolve during the execution of the workflow. Uncertainties are high and changes occur frequently. It involves human interaction, coordination and co-decision (Schael and Zeller, 1991). Strong rule definitions can facilitate the automation of Ad hoc workflows to a certain extent, however, compared to production, administrative and collaborative workflows automation is weak.

Existing workflows support administrative tasks, production and service delivery, however, in the public sector its use has been limited to administrative tasks only. Extant workflow applications highlights a gap in the literature and requires citizen-centric workflow models, with the ever increasing demand for citizen participation in public decision making processes by enabling citizens and decision makers to interact on the same platform and allowing citizens to have maximum access to decision making processes. The benefits of workflow adoption are flexibility, integration and reusability and are discussed in detailed work by Leymann and Roller (2000).

Several modelling formulations have been used as the basis of workflow models and these can be categorised into three types: Petri-nets, Input Process Output (IPO), and rule based approach.

Sun *et al*. (2006), suggested that most of the workflow models are formalised based on Petri nets (Aalst, 1998; Aalst and Hofstede, 2000), Activity based modelling (Georgakopoulos *et al*., 1995; Bi and Zhao, 2003; 2004), Object coordination nets (Wirtz *et al*., 2001) and rule based process modelling (Lee *et al*., 1999). Authors further identify Workflow nets (WF-nets), Activity based workflow, OCoN (Object coordination nets) workflow and the Knowledge based workflow model (KWM) as representative workflows for the modelling approaches. These are presented in table 2.10, which evaluates each of the workflow models against the dimensions perceived to be important in this study. These dimensions have been selected to evaluate the appropriateness of the models for the business processes such as policy making. Role resolution, rule expressiveness and adaptability allow assessing for the automated assignment of roles and tasks to the participants. Such automated activities allow organisations to distribute tasks to the right participant at the right time, minimise delays and routing errors. Adaptability also assesses attributes of the workflow models that are able to handle changes in the business environment. Model, process actors and mobility support dimensions concede to further compare the models against their abilities to serve processes that are dynamic in the number of participants, are geographically expanded and future extensions of the model. Tables 2.10, empowers the study to identify workflow technology as one of the solutions to automate the policy making process, involve citizens participation from a wide location and to produce better policies through process improvements.

Workflow models	**WF-nets**	**Activity-based workflow**	**OCoN**	**KWM**
Approach	*Control flow*	*Activity based*	*Object coordination*	*Rule based*
Dimensions				
Purpose	Workflow procedures	Commercial workflow	Application objects and workflow	Agile organisations
Role resolution	N/A	N/A	Yes	Yes
Rule expressiveness	Yes	Yes	Yes	Yes
Adaptability	Yes	Yes	Yes	Yes
Model	Transitions, places, arcs, tokens	Activity, routing, arcs	Actions, pools, resources, edges, event	Entity, Relationship, rule
Process actors	Limited	Limited	Limited	Large
Mobility support	N/A	N/A	Yes	Yes

Table 2.8: Comparison of workflow models

2.4.1.1 WF-nets

Firstly, Petri nets are most widely used as the basic modelling formalism of workflow models. Petri nets emerged as a workflow tool for modelling and analysing processes in the early 1990s. It can be exploited as a design language for the specification of multifaceted workflows, conversely, Petri nets theory offers influential investigation techniques that can be used to verify the precision and accuracy of workflow procedures (Lee, et al., 2011). This tool facilitates processes to be presented diagrammatically. Regardless of the fact that Petri nets are graphical, they have a strong arithmetic foundation and are exclusively formalised. Its predetermined underpinning makes it an appropriate participator to have robust declarations about the properties of the process being modelled. Some of the key performance indicators are: average throughput time of cases, average waiting time, occupation rates of resources, service levels, and the average number of pending cases (Aalst, 1998).

A classical Petri net is a directed graph with three constructs; places, transitions and arcs. Places are used to define the possible state or conditions of the system (pre or post conditions) whereas transitions are activities or tasks. Arcs connect places with transitions in either direction. They show a logical relationship between places and transitions. Tokens are used to display the behavioural aspect of the system and are therefore used to show which transition has been fired after consuming a token in a place (Slimifard and Wright, 2001). There are many extensions of Petri nets such as Coloured Petri nets (Jensen, 1992), times Petri nets (Aalst, 1993) and Workflow nets (van der Aalst and

Hofstede 2000). Petri nets models that show workflow procedure with two specific properties such as (i) workflow must have a source place (*i*) and sink place (*o*), (ii) each transition t (place p) there should be directed path from *i* to *o* via *t (p)* are called workflow nets (WF-net). In WF-nets, only individual case can be modelled and simultaneous processes of multiple cases cannot be modelled (Slimifard and Wright, 2001). Resources can be linked to WF-nets via workflow management tools. The resource class represents a set of roles or organisation units with similar characteristics. These are associated with tasks that allow resource classification to be linked to procedures. This linkage is carried out by workflow engines during enactment time (Van der Aalst, 1997; 1998).

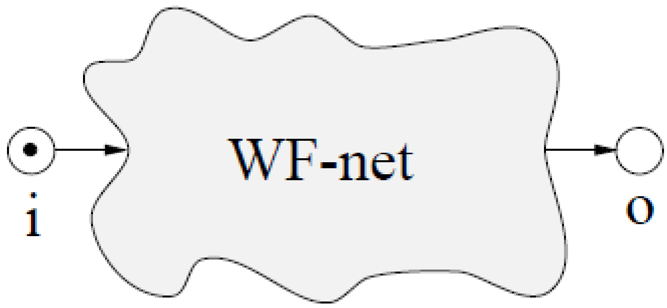

Figure 2.8: A procedure modelled by WF net (Van der Aalst, 1997)

2.4.1.2 Activity based workflow

In an Activity based workflow model, tasks or activities are in a process rather than resource perspective such as human commitments (Georgakopoulos *et al*., 1995). It is composed of a set of activities, routing vertices and directed links. Eight routing constructs have been mentioned in (Bi and Zhao, 2004) for effective workflow process structures expressiveness.

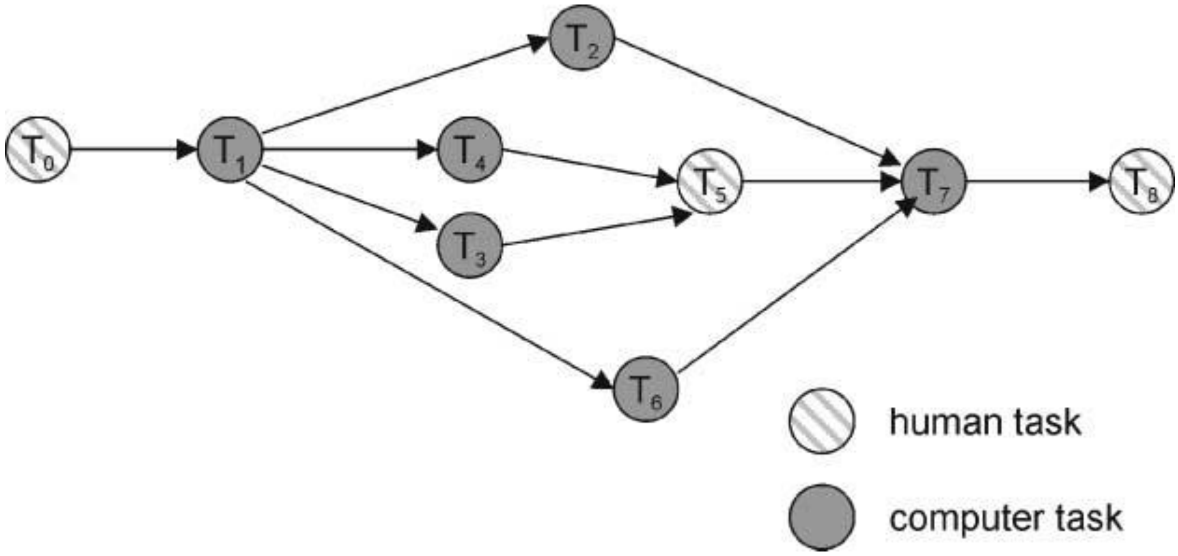

Figure 2.9: Activity based workflow model (Mentzas *et al*., 2001)

Figure 11 shows two types of roles responsible for carrying out the tasks: human tasks and computer tasks. Organisational data is required for assigning roles to actors which can be in the form of hard copy or electronic data. Roles exist within the tasks and no formal mapping of these roles is explicitly shown (Mentzas *et al*., 2001).

2.4.1.3 OCoN

Object coordination net design workflow works by integrating Petri nets with an object oriented approach. This enables the designer to fill the gap between the workflow design and software implementation (Sun *et al*., 2006). Elements adopted for the workflow model incorporate Petri nets elements such as transitions which are seen as actions (square box), pools (circles) replaces places and resources (hexagons) and takes an object oriented view which is the carrier of the activities. Resources further have been extended into types which imply each Resource has a Resource type. Edge connects actions and pools that determine whether there is pre or post condition depending on the position of the edge. A white arrowhead edge links actions to resources and black arrow head edges link pools with actions. An edge contains parameters that help identify the right resource to carry out the action as well as right action to be fired.

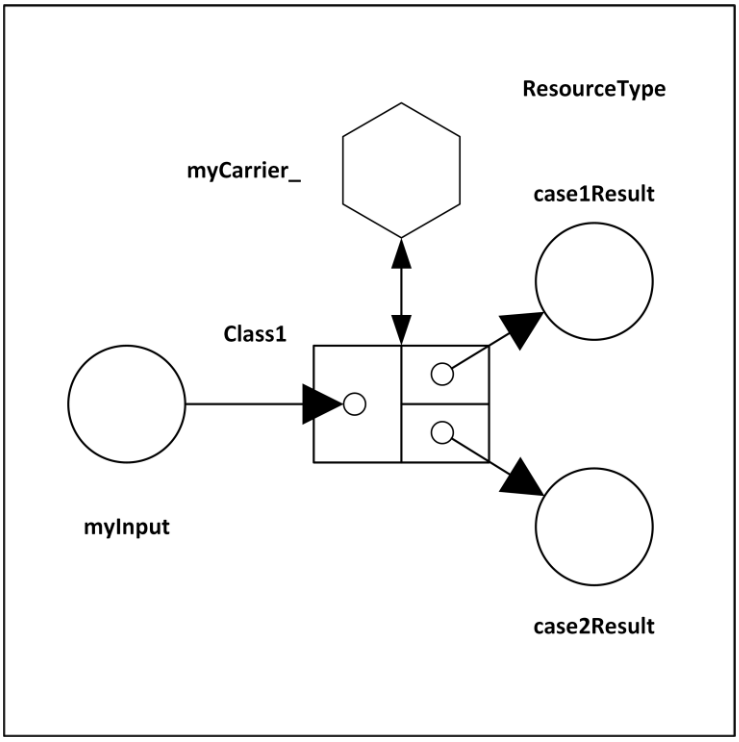

Figure 2.10: Elements of object coordination nets (Wirtz *et al*., 2001)

In order to fire an action, the resource type in the resource element would carry out the activity in accordance with the parameters defined in the pool and utilise the token, hence producing post conditions for next action.

2.4.1.4 KWM

A rule based approach has also been adopted in representing workflows in the literature. For example, KWM (Lee *et al*., 1999) takes a rule based approach in modelling business processes. The core components of KWM are represented as executable rules including routing, role resolution, and exception handling rules. The rule-based approach to modelling workflows allows easy maintenance of business rules in the execution of workflows, which are prone to failure due to changes of business rules. KWM also provides a workflow verification mechanism to check the soundness of KWM models.

The Knowledge based workflow model focuses on the adaptability of the process according to the changing business rules. This type of workflow makes the workflow process flexible and dynamic. When any change in routing, rule or role occurs in the target business process it adapts efficiently to it. Rules are used to fire workflow processes and to map roles to actors. KWM adopts frames for representing functional and behavioural aspects of the workflow. It is composed of an entity frame that can be a role, task, organisational unit, or a relationship frame that contains details about the source task or destination task. The Rule frame is the third component yet it is the most important in the workflow. It contains rules affecting the flow of tasks, mapping of conditional roles and a set of meta-rules that conditionally links two or more procedural rules or roles together. These frames hold slots and values that help in executing the workflow according to the conditions. In a procedural rule frame, the slots are used to define pre task, next task and conditions. Whereas a value slot allows defining the state of the pre task and next task and predicate for conditions that on being satisfied allows the next task to take the workflow control. In the same manner, a responsibility rule frame tells the workflow engine how to select the actors to carry out the task by providing constraints in the condition slot. Exception rules for task flow can be easily handled by defining the source rule with current procedural rule (pr) and target rule which will replace the source pr with new rules. This can only be done if the conditions specified in the condition slot by the users are met (Lee *et al.*, 1999).

FAME Rule IS_A: KWM_object; PROCESS; <process-name>; DESCRIPTION: <string>; CONDITION: [<condition-predicate>]; END_FRAME	FRAME Procedural_Rule IS_A: Rule; PRE_TASK: <task-entity> PRE_TASK_STATE: <task_state>; NEXT_TASK: <task_entity>; END_FRAME
FRAME Responsibility-rule IS_A: Rule; ROLE: <role-entity>; ACTOR: <entity> ‘.’ <slot>; END_FRAME	FRAME Metarule IS_A: Rule; SOURCE_RULE: [<rule-frame>,]; TARGET_RULE: [<rule-frame>,]; END-FRAME

Table 2.9: Rule specification frames (Lee *et al.*, 1999)

One of the most important functions of Wf technology is to assign tasks to eligible users. It is not only deployed in small group settings but also in large enterprises. When a large number of users are involved the role resolution becomes complex. This is due to different users having different roles and to qualify a user to carry out a task needs specifications for roles. Roles are defined as capabilities and privileges required by the user to properly execute the task (Muehlen, 2004). Curtis *et al*. (1992: p.76), defines a role as “a coherent set of process elements to be assigned to an agent as a unit of functional responsibility”. The criteria used to determine who qualifies for a task is manifold in the literature. Some of the approaches are policy resolution architecture for specifying task assignment rules; role based access control to secure web based WfMS (Ahn *et al.*, 2000) and an object oriented organisational model to support role resolution in e-commerce (Cheng, 2000).

2.4.2 Workflow applications and benefits

The preamble of Wf technology and relevant tools are seen as a prospective possibility to enhance both the underlying business processes and the existing organisational structure (Van der Aalst and van Hee, 2002). Several benefits can be accumulated subject to successful implementation of workflow technology as part of a widespread business solution. Wfs are considered to be a significant component of a business for several reasons, including among others:

- Opportunities for organisational change e.g. WfMS changes business process and work activities ultimately leading to gratifying organisational structure (Storh and Zhao, 2001);
- Opportunities for process change (Kueng, 2000) e.g. provision of opportunities for reengineering business processes prior to the implementation of WFMSs;
- Tracking of tasks performance e.g. while aspiring to track certain allocated tasks, individuals may amass vital responses on task performance issues;
- Improved/increased access to information e.g. provision of information in more organised and formalised mode (Storh and Zhao, 2001);
- Improvements in production or service process (Kueng, 2000; Stohr and Zhao, 2001) e.g. organisations can effortlessly ascertain improvement areas and increase efficiency and to improve the quality of the product or service; and
- Improved customer services (Koulopoulos, 1995) e.g. the capacity to rapidly search for and recognise a work request within the process allows a manager to speedily reply to consumer enquiries.

Among the many benefits affiliated with a workflow system, application flexibility, integration, reusability and reduction in operation cost are incentives for using WFMF (Georgakopoulos *et al.*, 1995). It allows efficient control, monitoring, optimising and supporting business processes. Its ability to represent business process logics enables computerised supports (Aalst, 1998). It not only represents the business processes but also carries out processes in an efficient and effective manner (Antonucci and Goeke, 2011). Other advantages of the implementation of process management are prioritising resource allocation, enhanced performance and the effective implementation of process oriented systems (Gulledge and Sommer, 2002).

According to Ames *et al.* (1996) most of the WfMS are web-based in the recent years. With the facilitation of Internet, workflow and document transfer technologies most of the major tasks of public administrations has seen efficiency improvements. The E-government business process is considered to be highly complex, as a number of actors such as citizens, administrative staff, authorities etc., is involved with a variety of business processes.

In the public sector, the adoption of business process systems is present in different domains, such as the police force, army and defence, hospitals, universities etc. (Kerschner and Raaf, 2008). Many research projects in the public sector are focused on improving the quality of public services delivery while reducing the associated cost, examples are European Commission funded projects like CitizenScape (2008); eCommittee (2008); eMPOWER (2009); HUWY (2009); EuroPetition (2009); FEED (2008); IDEAL-EU (2008). However, workflow adoption in the policy making domain has been limited to administrative tasks only and its full potential has been ignore so far. These promising benefits of workflow technology can enhance policy making processes, provide access to information on a larger geographical scale to customers, allow tracking of citizen input to policy making processes and retrieving information on policies.

2.4.3 Workflow functional attributes

One of the most important features of workflow technologies is automation. The automation feature has been associated with workflow when it is defined (Zhuge, 2003; Basu and Kumar, 2002). Automation plays an important role in cost reduction, run time efficiency and customer satisfaction which has created a trend of adopting workflow technology for automation (Basu and Kumar, 2002).

Workflow enables controlling, collaboration, coordination and monitoring of processes that in turn reduce human interventions, errors and allows smooth execution of processes when workflow technology is used for automation (Koulopoulos, 1995; Verbeek and Aalst, 2000, Sun, *et al.*, 2006; Mentzas *et al.*, 2001). These functional features have been mentioned in research studies many times and which have proven workflow technology as a useful and much needed tool for achieving performance efficiency and productivity. Workflow technology is also adopted for automating business processes and information processes (Georgakopou and Hornick, 1995; Mentzas *et al.*, 2001). One of the major benefits of deploying workflow technology is its ability to assign tasks to actors during runtime automatically (Zeng and Zhao, 2005). The role resolution function of workflow technology allows ease of assigning tasks to actors where tight coupling exists between role descriptions and process actors. Role resolution is a relevant function that can improve the policy making process when a large number of participants is involved with varied and multiple roles. Table 2.12, lists major features of workflow technology in the literature and provides a brief description of each function. It helps in understanding the terms used throughout the study and identifying them as functional characteristics of WfT, to be studied for workflow technology adoption in the later chapters.

Functions	Description	Research studies
Role resolution	"The mechanism of assigning tasks to individual workers at runtime according to the role qualification"	Zeng and Zhao, 2005; Aissi *et al*. 2002
Automation	"Computer programs performing tasks and enforcing rules previously implemented by humans"	Georgakopou and Hornick, 1995; Park and Kim, 2009; Aguilar-Saven, 2003; Workflow Management Coalition, 1996; Zhuge, 2003; Verbeek and Aalst, 2000; Zeng and Zhao, 2005; Sun, *et al.*, 2006; Basu and Kumar, 2002
Controlling	Specifying, executing, reporting information	Stohr and Zhao, 2001, Zeng and Zhao; 2005; Bae, 1999; Koulopoulos, 1995; Lawrence, 1997; Mentzas *et al.*, 2001; Basu and Kumar, 2002
Collaboration	Collaboration of people and systems to achieve set goal	Georgakopou and Hornick, 1995; Aguilar-Saven, 2003; Workflow Management Coalition, 2000; Bae, 1999; Mentzas *et al.*, 2001
Coordination	Managing exchange of information	Georgakopou and Hornick, 1995, Park and Kim, 2009; Aguilar-Saven, 2003; Workflow Management Coalition, 1996; Verbeek and Aalst, 2000; Sun, *et al.*, 2006
Monitoring	Keeping business processes under surveillance for its correct execution	Koulopoulos, 1995; Lawrence, 1997
Information processing	Using information as input and producing information output	Georgakopou and Hornick, 1995; Galbraith, 1977; Mentzas *et al.*, 2001; Kumar, 2002

Table 2.10: Research studies mentioning functions of workflow technology

2.4.4 Organisational motivation for adopting workflow technology

The normative literature on the workflow capability's impact on organisation and human behaviour is scarce to date. According to Zhuge (2003), research accumulated on the workflow domain has been limited to extending workflow models, developing and updating workflow standards, verification methods and workflow application systems development. Much of the technical issues have been discussed however managerial and human issues have been neglected (Storh and Zaho, 2001). This gap highlights a significant opportunity to investigate the impact workflow features has on organisations and human behaviour and how decisions are made to adopt workflow technology. Section 1.2 suggests that lack of discussion of factors for workflow technology adoption in the literature necessitates identifying some of the influential factors from the contextual perspective and functional fit. However, to analyse organisational motivation for adopting workflow technology, this thesis adapts Davenport and Short (1993) nine critical IT capabilities and their organisational impact and presents it in table 2.13. These capabilities are similar to workflow features, however to accommodate the organisational impact presented by Davenport and Short (1993), further studies have been researched to support workflow's impact on organisations. These benefits are reaped while workflow technology is adopted for process improvement and higher productivity.

Workflow capabilities	**Organisational impact/ benefits**	**Theoretical studies (T) Empirical studies (E)**
Transactional	Transforms unstructured processes into routine transactions	Kueng, 2000 (E)
Geographical	Distribution of information across large geographic distances	Zhao *et al*., 2000 (E), Salimifard and Wright, 2001
Automation	Reduction in human intervention in execution of process	Georgakopoulous and Hornick, 1995 (T); Basu and Kumar, 2002 (T)
Analytical	Analysis and evaluation of processes	Georgakopoulous and Hornick, 1995 (T); Aguilar-Saven (2004); Bae, *et al*., 1999 (E)
Informational	Processing of large quantity of information	Stohr and Zhao, 2001 (T); Salimifard and Wright, 2001
Sequential	Task can be performed in sequence or parallel	Georgakopoulous and Hornick, 1995 (T); Aguilar-Saven (2004); Salimifard and Wright, 2001
Knowledge management	Optimal utilisation and diffusion of knowledge and expertise	Offsey, 1997 (T); Kueng, 2000 (E)
Tracking	Detailed tracking of task, input and output	Sajjad, *et al*., 2011 (T); Salimifard and Wright, 2001
Disintermediation	Business to business collaboration	Aguilar-Saven (2004), Zhao, *et al*., 2000 (E); Stohr and Zhao, 2001 (T), Salimifard and Wright, 2001

Table 2.11: Based on Davenport and short (1993)

Workflow abstracts business processes and enhances process structure by eliminating unnecessary or repetitive tasks. Process performance can be measured and tasks can be arranged to become routine task. Information flow is more structured and organized through workflow implementation (Offsey, 1997). Information sharing and distribution over a large geographic area is facilitated as workflow technology distributes automatically relevant information to the right role and being connected as inter organisation workflows allow the distribution of information to organisations which are located at large distances (Salimifard and Wright, 2001). Inter organisation workflows link the business processes of one organisation to another without any need for an intermediary, hence facilitating business-to-business collaboration (Salimifard and Wright, 2001).

Apart from providing information, it also collects knowledge and expertise from one point and distributes it on larger scale. Access to information is enhanced and understanding of complex processes is made possible. This activity enables utilisation of knowledge and expertise across work units and organisations. Increased collaboration and automated coordination reduces human interventions and instead, allow them to be productive at more intellectual tasks. Automatic coordination and collaboration plays an important role in performing multiple tasks simultaneously, such as transactional workflows (Georgakopoulous and Hornick, 1995). This also highlights workflow’s importance when large amounts of information need to be processed. Workflow has the capability of processing a large number of instances ubiquitously, for instance a Telecommunication Company that processes thousands of cases per day (Georgakopoulos *et al*., 1995).

Last but not the least, workflow allows tracking functions for individual process states (Muehlen, 2001). Monitoring and controlling features of workflow technology keeps track of each case and information can be retrieved anytime. Therefore, workflow technology is an efficient tool for disseminating information to many locations, collection of information, tracking activities within and outside the organisation, processing large quantity of cases and benefiting from the automation mechanism.

2.5 IT Adoption at Organisation’s Level in Public Sector

Several studies mention IT adoption, diffusion and acceptance such as Diffusion of Innovation (DOI) (Rogers, 1983); IT adoption model (Dixon, 1999); IT innovation adoption research model (Agarwal and Prasad, 1998) etc., to evaluate the feasibility of IT adoption. Models such as the Technology Acceptance Model (TAM) (Davis *et al*., 1989) that has been extensively studied and expanded into Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al*., 2003), TAM 2 (Venkatesh & Davis 2000 & Venkatesh 2000) and TAM 3 (Venkatesh & Bala 2008); IS success model (DeLone and McLean, 1992), have been adopted to understand employee motivation behind IT adoption and use. At the organisational level, IT adoption has been studied to find out factors leading to technology strategic orientation (Gatignon and Xuereb, 1997), resource based adoption factors in the supply chain (Zhang and Dhaliwal, 2009) and the adoption of integration technologies EDI (Bamfield 1994), ERP (Bradford and Florin 2003), Web services (Chen, 2003) and EAI (Khoumbati *et al*., 2004).

Public organisations have adopted IT due to its benefits with performance improvements capabilities and efficiencies. The last few years have seen an immense growth in the adoption of IT in the public sector. In the UK, IT adoption in the public sector has been popular and it has been realised as an inevitable solution for providing services to citizens at lower cost (Beynon-Davies and Williams, 2003; Brown, 2001). According to Brown (2001), heavy investments by the public sector in IT make it the largest user of IT in the UK. Also, the initial adoption of IT was restricted to administrative tasks in the public sector which then moved to outsourcing IT with the proliferation of IT and reputation for performance efficiency (Brown, 2001). Outsourcing also highlighted significant factors circumscribing IT adoption such as lack of internal IT support staff. However, with an understanding of the prerequisites for process efficiencies, access to government services, transparency and citizen empowerment (Schware and Deane, 2003), the government bodies are adopting IT keenly.

2.5.1 Taxonomy of IT adoption

Different IT hardware and software implementation has been witnessed in the public sector over the years. Due to the information intensive nature of the public sector and complex processes, it requires IT adoption to facilitate internal functions and utilise automated services. Table 2.14, classifies different IT adoption studies over a time period to demonstrate its various usage in the public sector. Microcomputers, also known as personal computers (PC), in both the private and public sectors are indispensable technology. However a quantitative study conducted by Bretschneider and Wittmer, (1993) found more usage of PCs in the public sector than in the private sector and the findings showed that for the public sector to be information intensive requires computer facilitation in day-to-day functions. Motivational factors for IT adoption in the public sector have also caught the attention of academics (Brown, 2001). From e-services, e-procurement to e-government, the public sector has advanced to Enterprise Application

Integration (EAI) for multiple IS collaborations. Such technologies allow organisations to benefit from the application interconnectivities and reduce integration problems (Kamal and Themistocleous, 2006). Therefore, IT plays a crucial role in both public and private sector and its usage is advancing with time as demand for automation, integrated IT infrastructure and process efficiency rises. Policy makes process in the public sector, being information intensive and orientated towards collaborative decision making, it highlights a sector in public administration that can benefit from appropriate IT utilisation for empowering citizens, producing citizen collaborative policies and automation of large scale information processing.

Authors	**Methodology***			**IT adoption**	**Focus of research**	**Conclusions/findings/suggestions**
	T	**QL**	**QT**			
Bretschneider and Wittmer, 1993			√	Microcomputers	Diffusion of microcomputers in private and public organisations	Major differences found in the adoption of microcomputers. Public sector uses microcomputers more partially due to information intensive activities involved.
Brown, 2001	√			IT application	Motivational factors for IT adoption in public sector	Organisational issues and lack of motivational factors in IT application failures
Hinnant and O'Looney, 2003			√	E-services	Determining factors responsible for online technological innovations in public organisation	Reduce risk and determine demand before adoption of online innovations
Henriksen and Mahnke, 2005		√		e-procurement	Investigating slow adoption of public e-procurement portal	Political structural factors are responsible for slow growth in public e-procurement portal
Lam, 2005		√		EAI**	EAI as a solution to integration problems	Critical success factors for EAI are similar to ERP
Lam, 2005		√		e-government	Barriers to e-government integration	Barriers to e government adoption are categorised as strategy, technology, policy and organisation.
Kamal and Themistocleous, 2006	√			Enterprise Application Integration	Developing conceptual model for EAI adoption in local government	Factors influencing adoption of EAI in local government domain.
Damanpour and Schneider, 2006			√	Innovation	Factors effecting adoption of innovation	Organisation and top manager's attitude has high impact on innovation adoption in public organisations.
Cho, *et al*., 2008		√		Radiology network system	Application of Actor-Network Theory in implementation of radiology network systems in Swedish hospital	ANT can be adopted to analyse change due to IT implementation.
D'Agostino, *et al*, 2011			√	Websites	Analysis of e-government and e-governance	E-government is predominant on e-governance

*(T: Theoretical) (QL: Qualitative) (QT: Quantitative)

** (EAI: Enterprise Application Integration)

Table 2.12: Summary of IT adoption studies in public sector

2.5.2 Adoption processes

The literature shows significant contribution to the factors influencing IT adoption such as perceived benefits, ease of use, attitude, etc., however, the process of adoption describing the stages and functions has been discussed briefly and succinctly. Adoption is behaviour of acceptance and deliberate usage of innovation (Frambach and Schillewaert, 2002). Rogers (1995, p: 21) defines the adoption process as "*the process through which an individual or other decision- making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.*" It is a process where an individual or organisation has awareness, intentions and usage of innovation. More or less adoption process is composed of similar phases or with some addition.

Table: 2.15 summarises some key IT adoption process with multiple stages. It advocates awareness as the initial stage of the adoption process. It has been characterised differently in various studies (Cooper and Zmud, 1990; Marcus and Tanis, 2000). According to Frambach and Schillewaert (2002), organisational adoption occurs between the initiation and implementation stage. The initiation stage contains sub-stages such as awareness, evaluation, consideration and the implementation stage is the acquiring of IT and its utilisation. The implementation stage in some IT adoption process models has been considered as a diffusion stage where IT is not only accepted but its continuous usage takes place (Huff and Munro, 1985). The diffusion stage is attributed to be the success stage where IT is continually used over a period of time (Bhattacherjee, 1998). However, this stage is one step ahead of adoption where IT is utilised to confirm its utility.

All the adoption models summarised in (Table: 2.13) show that the adoption process is sequential, carried on over a period of a certain time and it is mostly a linear process. Moreover, to conclude the process of IT adoption, it can be said that process is a composite of awareness, intention, trial and continuous use stages and organisations or individuals go through these stages in the IT adoption process. Awareness, intention and trial are the pre adoption stages that help in making the decision to adopt IT. This suggests that there are factors that affect decision making which leads to IT adoption. The next section identifies appropriate theories of IT adoption that will aid in proposing factors for WfT adoption.

IT	**Methodology***			**Process stage**						**Liner or cyclical**	**Authors**
	T	**QL**	**QT**	**1**	**2**	**3**	**4**	**5**	**6**		
Various IT			√	Awareness	Interest	Evaluation	Trial	Implementation	Diffusion	Linear	Huff and Munro, 1985
MRP**		√		Initiation	Adoption	Adaption	Acceptance	Routinization	Infusion	Linear	Cooper and Zmud, 1990
Enterprise systems	√			Chartering phase	Project phase	Shake down phase	Onward and upward phase	_	_	Cycle	Marcus and Tanis, 2000
Innovation	√			Awareness	Considera tion	Intention	Adoption decision	Continued use	_	Linear	Frambach and Schillewaert, 2002
ERP***			√	Adoption initiation	Business case	Selection of IT and team	Initial plan	Communication to organisation	Decision to proceed	Linear	Kumar *et al*., 2002

*(T: Theoretical) (QL: Qualitative) (QT: Quantitative)

**(MRP:) ** *(ERP: Enterprise Resource Planning)

Table 2.13: Summary of IT adoption processes

2.6 Theoretical Paradigms for IT Adoption at Organisation's Level

Section 2.5 suggested that the IT adoption process has pre-adoption stages relating to decision making. The internal and external factors of the organisation affect human behaviour in terms of the decision to adopt IT. This adoption process relates to the research problem presented in section 1.2 that states there is a lack of a theoretical framework for WfT adoption in the literature, which could be used to assist in making sound decisions. Hence, in order to fill the gap, it is important to identify factors of WfT adoption and develop a framework for evaluation before presenting it as a novel framework. Since, the research question stated in chapter 1 suggests exploring the contextual and functional perspective, this section extends the literature by reviewing IT adoption theories, which are capable of identifying factors satisfying the requirement of the research questions.

Among the IT adoption theories, the most cited ones are Institutional theory (DiMaggio and Powell, 1983), TPB (Ajzen 1985, Ajzen 1991), TAM (Davis 1986; Davis *et al*., 1989), TOE (Tornatzky and Fleischer, 1990), DOI (Rogers, 1995), (UTAUT) (Venkatesh *et al*., 2003) and TTF theory (Goodhue, 1995). However, to remain relevant to the research questions only theories that are at the organisational level have been considered and therefore, Institutional theory, DOI, TOE and TTF theories have been explored.

2.6.1 Institutional theory

Institutional theory is adopted to understand the impact of external forces on organisational behaviour when adoption is considered (DiMaggio and Powell, 1983). It provides adequate understanding of what environmental factors, where an organisation is established, has impact on the adoption of IT (Berger and Luckmann, 1966; Meyer and Rowan, 1977 and Zucker, 1977). DiMaggio and Powell (1983) suggest there are three external pressures from trading partners, competitions, customers and government which push organisations towards adoption and these are coercive, imitative and normative legitimizations. Coercive pressure is created formally or informally by other organisations or society. Imitative pressure is to mimic other organisations' success and therefore adopts the same strategy or technology (Soares-Aguiar and Palma-Dos-Reis 2008). Normative pressure plays its role when organisations see certain types of IT adoption as best practice in the context of society or a specific industry (Soares-Aguiar and Palma-Dos-Reis 2008). Therefore, institutional theory addresses what environmental forces exist and how they affect an organisation's decisions for IT adoption.

2.6.2 Diffusion of Innovation Theory

Diffusion of innovation theory (Rogers, 1995) can be regarded as the oldest adoption theory which analyses adoption decision behaviour. Initially it was the concept developed by French sociologist Gabriel Trade and the German sociologist George Simmel in 1903 (Rogers, 2003). From there Diffusion of Innovation theory was developed and also became the underlying concept of technology acceptance models in the IS literature. It has also been adopted and extended to analyse adoption of many information technologies (Cooper and Zmud, 1990; Hsu, *et al.*, 2006 and Eder and Igbaria, 2001). According to Rogers (1995), diffusion of innovation basically explains how and why technology is adopted, at what rate over time and its diffusion into culture. He further adds, DOI at the firm's level suggests that organisations adopt innovation as a result of influence by an individual characteristic and the organisation's internal and external characteristics.

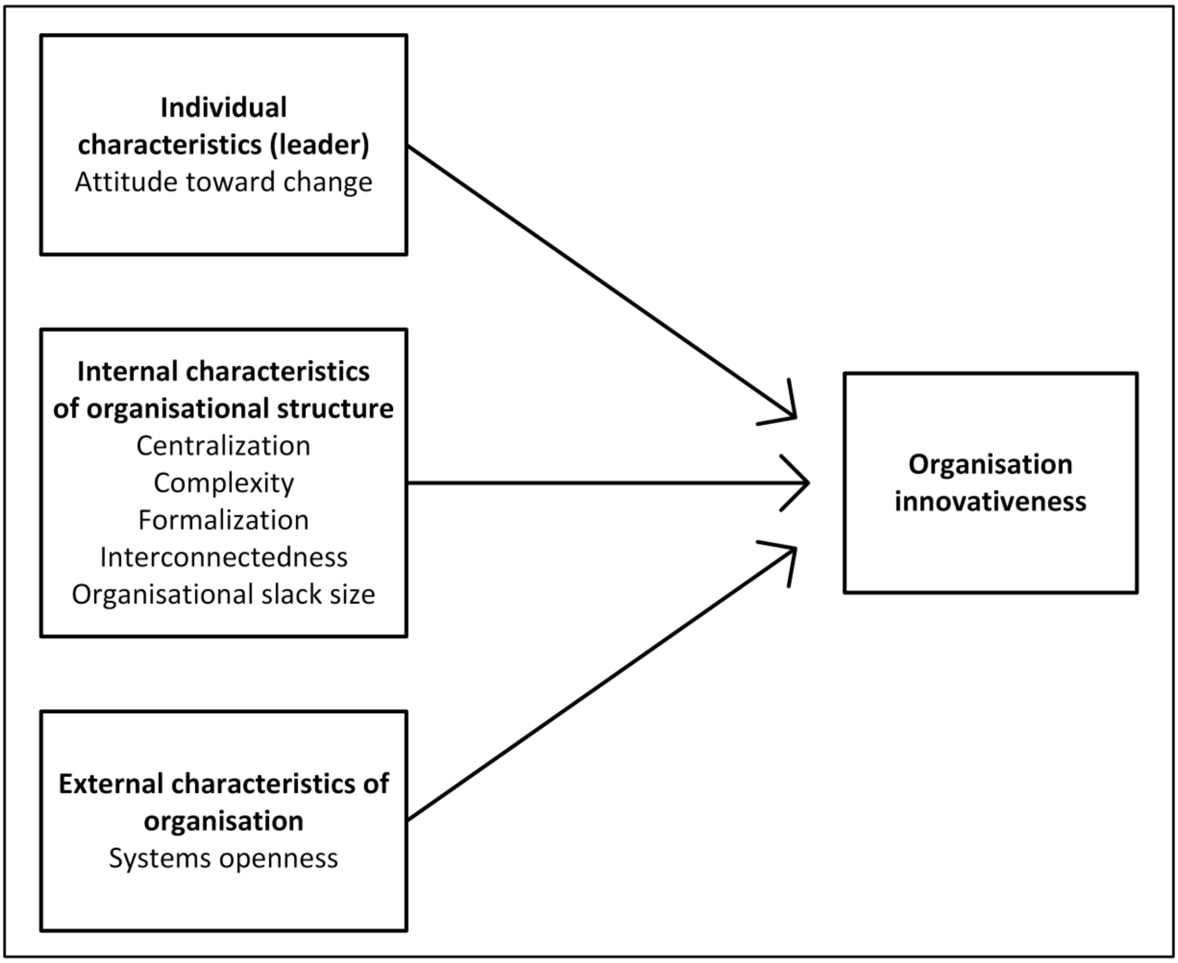

Figure 2.11: Diffusion of Innovation (Rogers, 1995)

2.6.3 Technology, Organisation, Environment theory

Technology, Organisation and Environment (TOE) theory provides a framework for analysing IT adoption at the firm level. First presented in 1990 by Tornatzky and Fleischer it has been adopted and adapted since its introduction (Kuan and Chau 2001; Teo *et al*., 2006; Oliveira and Martins 2010a). It suggests that the decision to adopt technology is effected by the external environment, organisation and technology. The external environment is the place where the organisation operates and faces socio-political pressures (Tornatzky and Fleischer 1990). The organisation context refers to its internal characteristics such as size, structure, processes etc. Lastly, the technological context encompasses all the internal and external technologies that are associated with the organisation.

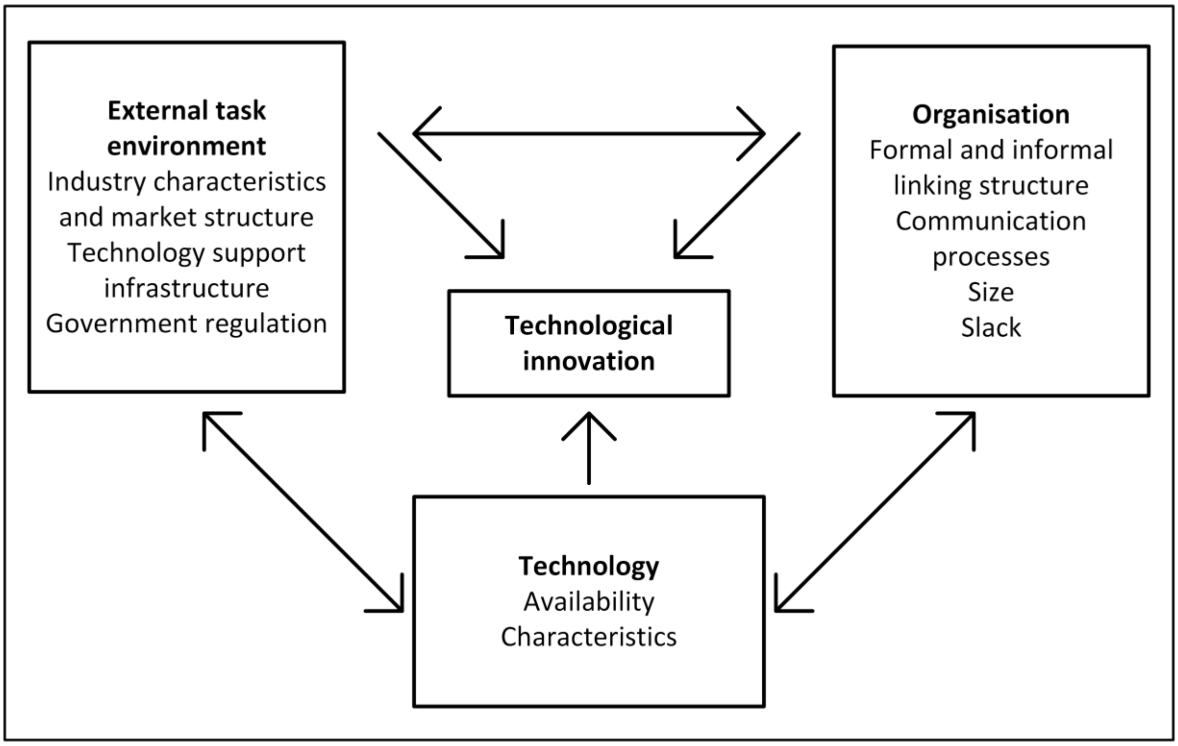

Figure 2.12: Technology, Organisation, and Environment framework (Tornatzky and Fleischer 1990)

2.6.4 Task, Technology Fit theory

Task, Technology Fit theory postulates that organisation will be ready to adopt a technology if the features of the technology match with the tasks of the organisation (Goodhue, 1995). It is believed that if individuals are given technologies, with functions that allow them to carry out activities efficiently, it will lead to the adoption of that technology in a more favourable way (Goodhue and Thomas, 1995). This postulate holds true as individuals who are experienced will adopt technologies that give them net benefit in utilising the technology and will ignore the ones that bring no advantage to their activities (Dishaw and Strong, 1999). The Fit element in the theory posits that the positive or negative impact technology will have on the adoption will depend how much functions of technology matches with task requirements. Task and technology function has direct effect on the 'fit' of the technology, which then affects either performance or adoption (Goodhue and Thomas, 1995). At the organisational level the fit aspect has been associated with utilisation or adoption (Cooper and Zmud, 1990; Goodhue and Thomas, 1995).

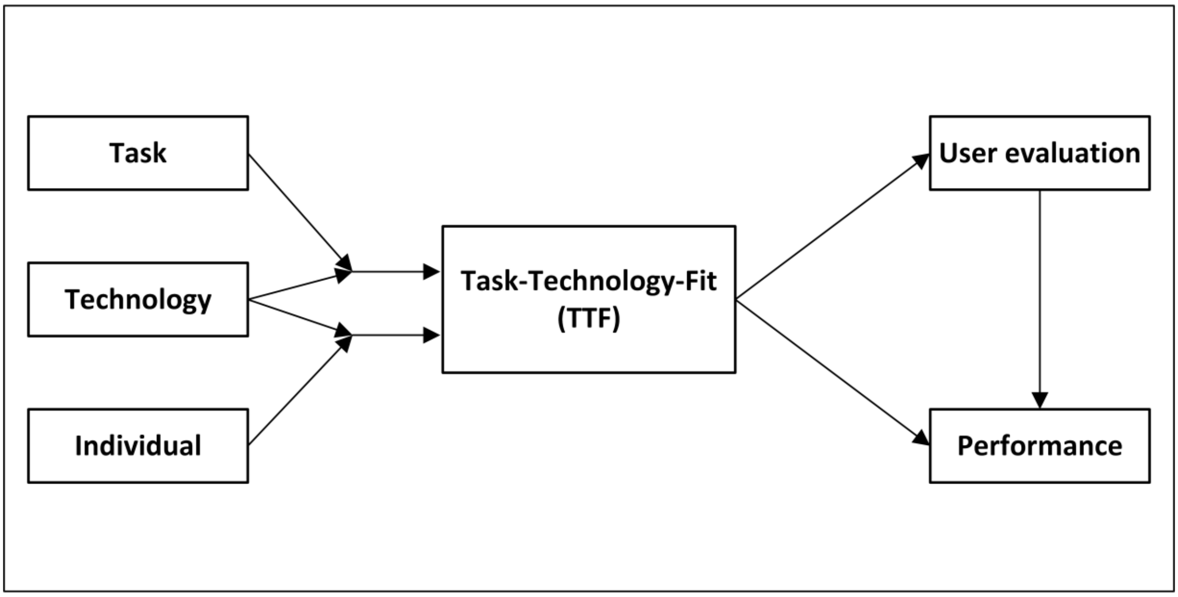

Figure 2.13: Task-Technology-Fit model (TTF) by Goodhue (1995)

TOE and TTF theory are most relevant to the aim of this research and hence DOI and institutional theories have been ignored due to their major focus on external environment and lack of determining attitude towards adoption (Karahanna *et al*., 1999; Chen *et al*., 2002). Also, their deficiency in focusing on technology features and not considering organisation processes does not make them fit for this research. Institutional theory's argument of imitating technology as best practice may seem to be too vague, as organisations differ in their goals, strategies and business vision. What works for one organisation might not work for the other. TOE theory on the other hand encompasses organisational and environmental characteristics found in both Institutional and DOI theories and incorporates technology factors such as drivers of technology adoption. TTF theory is more technology oriented and highly values IT functions' appropriateness for task requirements. This task technology fit factor has been missing in many IT adoption models in the IS literature (Goodhue and Thompson 1995). By adding fit factor to the theory, TTF allows analysing utilization and user attitude towards adoption of IT. TOE theory considers the environmental, organisational characteristics and TTF theory which help in understanding the task and technology fit. Adopting these two theories to understand drivers of adoption for workflow technology integration in public policy making is the most suitable.

2.7 Theoretical Support

Technology-Organisation-Environment framework (Tornatzky and Fleischer, 1990) possess constructs similar to Innovation Diffusion theory and Lacovou *et al*.'s (1995) research on Electronic Data Interchange (EDI) adoption in small firms identified organisational, technological and environmental characteristics as predictors of EDI adoption. Their model was further adopted and tested by Kaun and Chao (2001) on a larger scale that incorporated empirical data collection from 575 firms in Hong Kong to predict EDI adoption factors. The results verified Lacovou *et al*.'s (1995) research and provided further empirical support for TOE theory on suitability for IT adoption (Kaun and Chao, 2001). It further suggested that IT adoption does not only depend on IT characteristics but also depends on internal company characteristics and the external environment.

According to Tornatzky and Fleischer (1990) technology adoption can be predicted by understanding three important characteristics which are technological, organisational and environmental. Technological characteristics refer to all the technologies relevant to the firm, whether existing technologies within the firm or external technologies that can influence the firm in any ways. Organisational characteristics refer to structure, size, resources, managerial knowledge etc. Environmental characteristics are the industry domain where the firm operates, regulatory pressure, customers, partners, also referred to as external pressure. These features are known in the IS literature and especially in IT/IS adoption area.

However, the elements describing the characteristics of TOE change according to IT and organisation business nature (Themistocleous, 2004; Khoumbati, 2005) but demonstrate consistent empirical support (Zhu *et al.*, 2003). Based on the work of Tornatzky and Fleischer (1990) and Locovou *et al*. (1995), a study investigating open systems adoption revealed effective deployment of the TOE model. Interviews from 89 firms in Hong Kong with open systems technology specific characteristics were analysed which revealed that the adoption of complex IT can be understood by identifying technological, organisational and environmental characteristics (Chau and Tam, 1997). Zhu *et al.* (2003) also confirmed the usefulness of Technology-Organisation-Environment framework by extending it to the e-business domain and conducting empirical research based on the data from 3552 firms in Europe.

Further studies have combined TOE framework with other theories and have found consistent empirical support for TOE adoption on its own and in combination with other theories. The characteristic of TOE to be combined with other theories makes it more useful and applicable in complex IT domains. Studies in the literature have combined TOE theory with, DOI, Institutional theory and Lacovou *et al.'s* model (1995) to understand adoption of Collaborative commerce, E-business, RFID and E-procurement technologies and found consistent usefulness and appropriateness of TOE theory (Chong *et al*., 2009; Zhu *et al.*, 2006a; Wang *et al.*, 2010; Li, 2008; Gibbs and Kraemer, 2004; Hsu *et al.*, 2006 and Oliveira and Martins, 2010b).

Table 2.16, is a compilation of TOE studies conducted by Oliveira and Martins (2011) to present studies from the literature that have extended the TOE framework. The table has been further investigated and extended to the current date in this study for investigating TOE's role in workflow technology arena. It also shows a lack of studies conducted on workflow adoption and the immense potential of the TOE framework that has been proven useful for rest of the technologies. However, with much potential of TOE theory, it has not been applied in the workflow adoption context, leading to a gap in the literature, which the table 2.16 highlights. Moreover its strong theoretical basis, firm empirical support, ability to determine complex IT adoption, combining power with other IT adoption theories and its explanatory element of technological, environmental and organisational influences on IT proves it to be a strong candidate for studying factors of workflow adoption in public policy making.

The table also highlights different factors of TOE theory impacting on the adoption of IT and also shows that some factors are repetitive while others are newly added to study a particular technology. It supports current studies by allowing the selection of some factors that may have impact on workflow technology and which can be further investigated for its influential power. This study considers table 2.16 as an important gap analysis, which signifies a lack of studies using TOE theory for investigating the workflow adoption phenomenon and at the same time helps in identifying factors that may influence workflow technology adoption.

The research questions identified in section 1.4, will guide the study further in developing the conceptual framework to fill the gap in the literature. It also guides the author in analysing the collection of data by allowing propositions to be developed. By identifying factors belonging to the dimensions of TOE, workflow adoption can be understood. These factors will suggest what might favour adoption of workflow technology in a policy making context and what factors have least influence. Overall by answering the research questions this study will reveal the factors affecting workflow adoption phenomenon in the policy making context.

Theoretical models	IT adoption	Analysed variables	Methods	Data and context	Authors
TOE	Open systems	Characteristics of the "Open Systems Technology" Innovation → perceived Benefits; perceived barriers; perceived Importance of compliance to standards, interoperability, and Interconnectivity. Organisational technology → complexity of IT infrastructure; satisfaction with existing systems; formalization of system development and management. External environment → market uncertainly	T-test, FA, logistic regression	Face-to-face interview, 89 firms Hong Kong	(Chau and Tam 1997)
TOE and DOI	Software applications	CEO characteristics → CEO's innovativeness; CEO's IS knowledge. IS characteristics → relative advantage of IS; compatibility of IS; complexity of IS. Organisational characteristics → business size; Employees' IS knowledge; information intensity. Environmental characteristic → competition.	T-tests, FA, discriminatory analysis, and partial least squares (PLS)	Letter with questionnaires sent during 2005, 166 small firms; Singapore	(Thong 1999)
TOE	EDI	Technological context → perceived direct benefits; perceived indirect benefits. Organisational context → perceived financial cost; perceived technical competence. Environmental context → perceived industry pressure; perceived government pressure.	Factor analysis (FA), and Logistic regression	Letter with questionnaires was sent; 575 small firms Hong Kong	(Kuan and Chau 2001)
TOE	E-business	Technology competence → IT infrastructure; e-business know-how. Organisational context → firm scope, firm size. Environmental context → consumer readiness; competitive pressure; lack of trading partner readiness. Controls (industry and country effect)	Confirmatory factor analysis (CFA), second-order factor modelling, logistic regression, and cluster analysis (CA)	Telephone interview during 2000; 3552 firms European (Germany, UK, Denmark, Ireland, France, Spain, Italy, and Finland)	(Zhu *et al.*, 2003)
TOE	E-Business	Technological context →technology readiness; technology integration. Organisational context → firm size; global scopes; trading globalization; managerial obstacles. Environmental context → competition intensity; regulatory	CFA, and structural equation modelling (SEM)	Telephone interview during 2002, 1857 firms across 10 countries	(Zhu *et al.*, 2006b)

		environment.			
TOE	e-commerce	Technological inhibitors → unresolved technical issues; lack of IT expertise and infrastructure; lack of interoperability. Organisational inhibitors → difficulties in organisational change; problems in project management; lack of top management support; lack of e-commerce strategy; difficulties in cost-benefit assessment. Environmental inhibitors → unresolved legal issues; fear and uncertainty.	FA, t-tests and discrimination analysis	249 firms North America and Canada	(Thompson *et al.*, 2006)
TOE	e-commerce	Technological → support from technology; human capital; potential support from technology. Organisational → management level for information; firm size. Environmental → user satisfaction; e-commerce security. Controls → firm property.	FA and OLS	e-mail survey, online survey and telephone interview during 2006; 156 firms. Shaanxi, China	(Liu 2008)
TOE	ERP	Technological context → IT infrastructure; technology readiness. Organisational context → size; perceived barriers. Environmental context → production and operations improvement; enhancement of products and services; competitive pressure; regulatory policy.	FA, and Logistic regression	Face-to-face interview, 99 firms Taiwan	(Pan and Jang 2008)
TOE	E-business	Technological context → IS infrastructure; IS expertise. Organisational context → organisational compatibility; expected benefits of e-business. Environmental context → competitive pressure; trading partner readiness.	CFA, and SEM	e-mail survey during 2006; 163 large firms Taiwan	(Lin and Lin 2008)
TOE, DOI and institutional theory	E-procurement	Technological context → relative advantage; complexity; compatibility. Organisational context → financial slacks; top management support. Environmental context → external pressure; external support; government promotion.	FA, and logistic regression	Telephone interview during 2006; 120 firms; 50-2000 employees China; manufacturing firms	(Li, 2008)
TOE	KMS	Technology aspect → Organisational IT competence; KMS characteristics (compatibility, relative advantage and	Not empirical work	Not empirical work.	(Lee *et al.*, 2009)

		complexity). Organisational aspect → top management commitment; hierarchical organisational structure. Environmental aspect → With external vendors; among internal employees.		Chinese	
TOE and DOI	Collaborative commerce (c-commerce)	Innovation attributes → relative advantage; compatibility; complexity. Environmental → expectations of market trends; competitive pressure. Information sharing culture → trust; information distribution; information interpretation. Organisational readiness → top management support; feasibility; project champion characteristics	FA, and OLS	e-mail survey; 109 firms Malaysian	(Chong *et al.*, 2009)
TOE	RFID	Technology → relative advantage; complexity; compatibility. Organisation → top management support; firm size; technology competence. Environment → competitive pressure; trading partner pressure; information intensity.	FA, and logistic regression	e-mail survey; 133 firms Taiwan; manufacturing firms	(Wang *et al.*, 2010)
TOE	e-business	Perceived benefits, Technology and organisation readiness, controls, environment and external pressure	Factorial analysis and logistic regression	2,459 firms	(Oliveira and Martin, 2010)
TOE and DOI	IEBT	Technology →relative advantage, compatibility, complexity, Organisation → management support, organisational readiness, Environment → external pressure, and government support	Partial least squares (PLS) technique	Questionnaire method	(Ifinedo, 2011)
TOE and DOI	RFID	Technology → relative advantage, compatibility, complexity, cost, security Organisation → top management support; firm size; technology knowledge, financial resources. Environment → competitive pressure, expectation of market trends	Structural equation modelling analysis	182 health care organisation	(Chong and Chan, 2012)

Table 2.14: Based on Research adopting TOE model (Oliveira and Martins, 2011)

The second theory that is most suitable to study workflow adoption factors is Task-Technology-Fit theory. The theory states that to determine IT adoption there has to be a fit between the tasks and the technology's functions and a positive attitude from the user will facilitate adoption of that technology (Lee *et al.*, 2007; Goodhue, 1998; Goodhue and Thompson, 1995). It can be deduced that the task characteristics must match the technology's functions and the user's attitude towards the use of the technology should be positive for its future utilization. The match between the task and the technology also suggests cost reduction, superior time delivery, less task complexity, efficient output and user satisfaction, as the user is able to perform task activities using the appropriate technology's functions (Lee, *et al.*, 2007).

The theory allows analysing the different task characteristics such as communication, coordination, information processing, collection, monitoring etc. These task elements can be identified, matched with the appropriate functions and consequently selection of the technology that best holds these required functions. It also highlights important aspects of effective adoption that not all technologies are meant to work best for every task. Some IT adoption theories such as TOE, DOI and Institutional theory, have considered organisational, environmental and technological contexts, however, they have not placed emphasis on task characteristics and technology's function match. Also, imitation, coercive pressure and normative pressure by the external environment (DiMaggio and Powell, 1983) cannot hold as a good justification for adopting a technology unless the technology's features match the organisation's tasks requirements.

TTF theory on its own and in combination with other theories have been applied in the literature to identify factors of IT adoption such as Group Support Systems, online shopping, mobile commerce, Learning Management Systems, mobile video entertainment. Among the theories TTF has been extended with the Technology Acceptance model (Dishaw and Strong, 1999; Klopping and Mckinney, 2004; Wu *et al.*, 2007), with Theory of Reasoned Action (Kankanhalli *et al.*, 2005; Lam *et al.*, 2007), individual ability constructs (Jarupathirun and Zahedi, 2007; Lee *et al.*, 2007) and social cognitive theory (Huang *et al.*, 2008). TTF has a direct effect on performance and the utilization of technologies and to further enhance the ability of the theory it can be combined with other appropriate theories to achieve a higher understanding of the impact on performance and usage (Dennis, *et al.*, 2001).

Theoretical models	**IT adoption**	**Analysed variables**	**Methods**	**Data and context**	**Authors**
TTF and Utilization	Systems and services	TTF: Task Technology and Individual. Utilization: Expected consequences of utilization, Perceived usefulness, User evaluation.	Confirmatory factor analysis	Questionnaire; Survey sample of 259 users in 9 companies	Goodhue, 1995
TTF and Utilization	Multiple technologies	TTF: Task characteristics, Technology characteristics, Utilization.	Multiple regression technique	Questionnaire survey; 600 samples, 25 technologies and 26 tasks	Goodhue and Thompson, 1995
TTF	Group support systems	TTF Task: Simple, problem, decision, judgement and fuzzy. Technology: Communication support, process structuring and information processing dimensions	–	–	Zigurs and Buckland, 1998
TTF and FAM	GSS	TTF: GSS capabilities, Generation, Choice, Combination. Appropriation: Appropriation support	T-Test	61 articles and 4 field studies	Dennis *et al*., 2001
TTF and TAM	Online shopping	TTF: Perceived usefulness, Perceived ease of use and behavioural intention to use. TAM: Perceived usefulness, Perceived ease of use and behavioural intention and Actual usage.	Confirmatory factor analysis	Web based survey of 263 undergraduates	Klopping and McKinney, 2004
TTF	Mobile commerce	TTF Individual differences, Assistance to insurance tasks.	Cronbach's a and Construct validity	Questionnaire; 238 samples	Lee *et al*., 2007
TTF and Locatability	Mobile technology	TTF: Task characteristic, Technology characteristics.	ANOVA and Cross checking	Experiment; 112 subjects test	Junglas *et al*., 2008
TTF and Performance chain	LMS	TTF: Expected consequences of LMS use, Attitude towards use. LMS Utilization: Social norms, facilitating conditions, Expected consequences of LMS use, Attitude towards use.	Partial least square and SEM	Questionnaire survey; 17 undergraduate degrees	McGill and Klobas, 2009
TTF and emotional enjoyment	Mobile video entertainment	TTF: Characteristics of content, characteristics of media platform. Emotional enjoyment. Satisfaction with mobile video entertainment.	Harman's single-factor test, Exploratory factor analysis	Experiment; 32 participants	Xu *et al*., 2010

Table 2.15: Some of the studies adopting TTF theory

Table 2.17 is a compilation of studies that has utilised task technology fit theory to analyse the adoption of IT. This table also shows a gap in the IS/IT literature where most of the important technologies have been studied with TTF theory and workflow technology has been ignored. The compilation of studies also highlights the empirical power of TTF theory that can be used to study and test IT adoption phenomenon. TTF theory emphasises information processing support features of the technology under consideration. It suggests that technology features should support task activities and the better the fit between features and task requirements the greater will be the use of technology. The policy making process is information process intensive, where information is gathered, processed and generated. For such a task, utilisation of technology should be able to support the information processing requirements.

This study proposes that the fit between workflow technology capabilities and policy making tasks requirements will lead to adoption of the technology. In order to find out the fit between the two, table 2.17 extends support to the study by generating ideas for collecting factors representing technology functions and task requirements for this study. Each technology presented in the table demonstrates varied functional capabilities and task requirements. It is derived from the table that every technology will generate different results when studied with TTF theory as the variables of task and technology are very different. Hence to deploy TTF theory for workflow adoption, this study will generate different factors to be studied. Therefore, it is important to identify workflow technology functions and factors of policy making tasks, which has not been done in the past. With these variables in hand, information on the impact of TTF dimensions on workflow technology may lead to an analysis of adoption phenomenon.

On the basis of a thorough understanding of the literature review on IT adoption theories at the firm level, this study considers TOE and TTF theories to serve the best purpose of this study. However, these theories have not been applied in the workflow technology context in the public policy making domain, this study will be the first to explore and integrate both theories for analysing workflow adoption. The author believes integrating the two theories will help in identifying factors from internal and external organisational specific contexts, technologically specific contexts, and the environmental context and, most importantly, will match the functions of Wf with the goals of public policy making.

Ignoring either of theories will not allow the proper understanding of the important factors which influence the adoption of workflow technology in the public policy making domain. TOE theory provides contextual support that brings under the lens all those factors where workflow will be deployed. Also, technology cannot only be adopted if the contextual supporting factors are favourable unless the functions of the technology are needed to facilitate the task execution. Therefore, it is necessary to keep both the contextual and functional perspectives of workflow technology under investigation for identifying the influencing factors of adoption.

2.8 Conclusions

Workflow technology has received much attention in the industrial sector and in the public sector, however, it has been discussed only in general terms. This has left the managers and practitioners in the public sector perplexed, as to how to utilise or integrate the workflow concept to achieve the benefits that the private sector has enjoyed (Gulledge and Sommer, 2002). Moreover, much of the extant literature is focused on the technical aspects of WfT such as its modelling, implementation, verification, extension etc., leaving insufficient understanding from the socio-technical, organisational and behavioural side.

Adopted IT must integratewith business processes well enough to be able to produce the desired results (Gulledge and Sommer, 2002). Wimmer *et al*. (2001), identifies potential issues in the application of workflow process in public administration, which also grinds down the civil hierarchy type of labour division. These issues reflect problems of how to categorise products and clients in public administration that are central to the business process reengineering concept. Another problem is how different activities in public administration can be seen as processes. Moreover, in a hierarchal organisational structure, higher levels of activity are usually collaborative in action. In public administration, significance attached to the protection of citizen rights, abiding by the rules and regulations and issues relating to legal validity cannot be overlooked in process optimization. This necessitates understanding how well the functions of WfT can match with the policy making tasks. Therefore, investigating the functional fit of the technology along with the organisational perspective is an important aspect of this study.

WfMS technology cannot only be used to automate business processes in the public sector but also to facilitate the participation of citizens in the policy making processes. The review of the policy formulation and workflow literature suggests there are many benefits of applying workflow technology to policy making process. Compared to the private sector, the public policy making process is highly information intensive and involves a large number of participants (citizens and policy makers). Processing of large amounts of information can be automated entirely or partially using workflow technology to improve process performance and gain customer satisfaction. Collaborating with citizens can produce better policy outputs. The literature review on policy making frameworks and processes suggests that it is a complex process and with citizen participation taking an important role and demand for higher transparency necessitates workflow adoption. Policy making is a process with activities, roles and stages that can be represented by workflow technology. Collaboration, coordination and role resolution features of workflow technology can automate the PMP. However, the literature shows a lack of WfT implementation in the policy making context whereas there exists many opportunities highlighting workflow adoption. Much attention has been focused on e-services, e-government, and integration applications that show the IT adoption trend in the public sector. Nonetheless, workflow technology has been limited to administrative tasks only.

Next, IT adoption theories can be used to understand workflow technology adoption in the policy making process. A combination of TOE and TTF theory can show a link between workflow features and activities in policy making processes and highlight organisational and environmental characteristics influencing workflow adoption.

Gaps identified from the literature are summarised below:

- Lack of a theoretical framework for WfT adoption.
- Insufficient literature on WfT from an organisational and behavioural perspective.
- Limited research conducted to identify contextual and functional perspective factors influencing WfT adoption.
- Limited adoption of WfT in the public policy making context.

The following chapter builds on the gaps identified in chapter 2 and develops a conceptual framework for WfT adoption. Factors of WfT adoption from organisational, technological environmental and functional fit are proposed and presented in a framework to be empirically validated in the chapter 5 and 6.

CHAPTER 3:PRELIMINARY CONCEPTUAL FRAMEWORK FOR WORKFLOW TECHNOLOGY ADOPTION

3.0 Introduction

Chapter 2 reviewed the literature on workflow technology, policy making in the public sector and IT adoption. It argued that the numerous benefits affiliated with the use of workflow technology for policy making and advocated a fit of the technology with policy making processes. Furthermore important issues emerged from the critical review carried out in chapter 2 that are considered to be the research agenda for this study. These issues are as follows:

- The literature review of workflow technology highlighted a lack of theoretical perspective and insufficient research from workflow technology’s adoption aspects. This review also highlighted a lack of any decision making framework available for workflow technology adoption.
- Workflow technology has been adopted in the public sector for administrative tasks and its full potential to serve the policy making process has stayed limited.
- Contextual and functional fit perspectives of WfT to provide a holistic understanding of the phenomenon.

This chapter builds its further work on the issues presented above and seeks to:

- Provide an understanding of how background theory leads to focal theory by exploring the application of these theories within policy making.
- Explain the significance of supporting theories (TOE and TTF) to workflow technology adoption.
- Build a conceptual framework for the adoption and evaluation of workflow technology in the policy making domain.

Section 3.1 presents the motivation behind the workflow adoption framework and in doing so it highlights the significance of the two theories and how they work together best to support the development of the proposed framework. Also, it builds a link between the background theory and focal theory presented in this study. The next section 3.2 provides propositions based on arguments from the relevant research work, which help in answering the research questions. These propositions suggest factors, which are then integrated in a relationship that may create an overall impact on workflow adoption in public policy making. Also, in order to guide the data collection and further analysis, these propositions play a vital role. Finally section 3.3 presents an initial framework for workflow adoption in the policy making process.

3.1 Motivation for Workflow Adoption Framework (WAF)

This section builds motivational ground for the development of a workflow adoption framework by first identifying the need for a framework and then the significance of adoption theories for workflow adoption. Contextual and functional phases are established before further investigation is carried out into what elements lies within these phases that have an impact on workflow adoption.

3.1.1 Need for a novel workflow framework

A thorough review of IS and public administration literature in chapter 2 highlights research gaps and supports the need to carry out a study that seeks to fill these gaps. With the immense potential of workflow technology to support administrative, ad hoc, collaborative and production processes (Ader, 1997), it has not been researched enough for adoption in the public sector. For public organisations to improve the performance and business processes they need to adopt workflow technology to automate processes, reduce cost, increase output rate and greater customer satisfaction. Nonetheless, the literature review on public administration revealed a lack of a framework that can enable the adoption of workflow technology.

Section 2.2, in chapter 2 shows that the policy making process is information intensive, entails tasks, activities, roles and process information from input to output. All this can be managed by workflow technology, however, it is important to have a tool that can determine its adoption first before implementation. This lack of a framework that can be empirically tested and which investigates workflow adoption can be overcome by adopting TOE and TTF theories. The importance and implications of both theories have been mentioned extensively in section 2.6, 2.7 and 3.11. It is also important to highlight the contextual and functional importance of workflow technology. A tool that can analyse both the context in which workflow technology will be adopted and relate its functional capabilities to context related tasks, is limited in the literature. Therefore, by applying TOE and TTF theories together it will serve this purpose well and develop a workflow adoption framework (WAF), which has explanatory power and a holistic view.

Lastly, both workflow technology's functional features and policy making task characteristics have not been explicitly defined in the literature. It is vital to analyse the processional aspects of the technology with respect to their application domain. Such categorization of factors belonging to task and function allows further analysis of the technology as well as to understand the significance of its utility. Once policy making task characteristics and technology functions are defined, they can be studied using TTF theory to confirm the fit element. The background theories (TOE and TTF theory) have been adopted in this study to propose its focal theory of workflow adoption in the policy making context. The proposed theory suggests that the adoption of workflow technology can be analysed by incorporating the TOE framework and the TTf model into a workflow adoption framework. Figure 3.1, exhibits the gaps found in the literature and how the focal theory of this research can fill in these gaps.

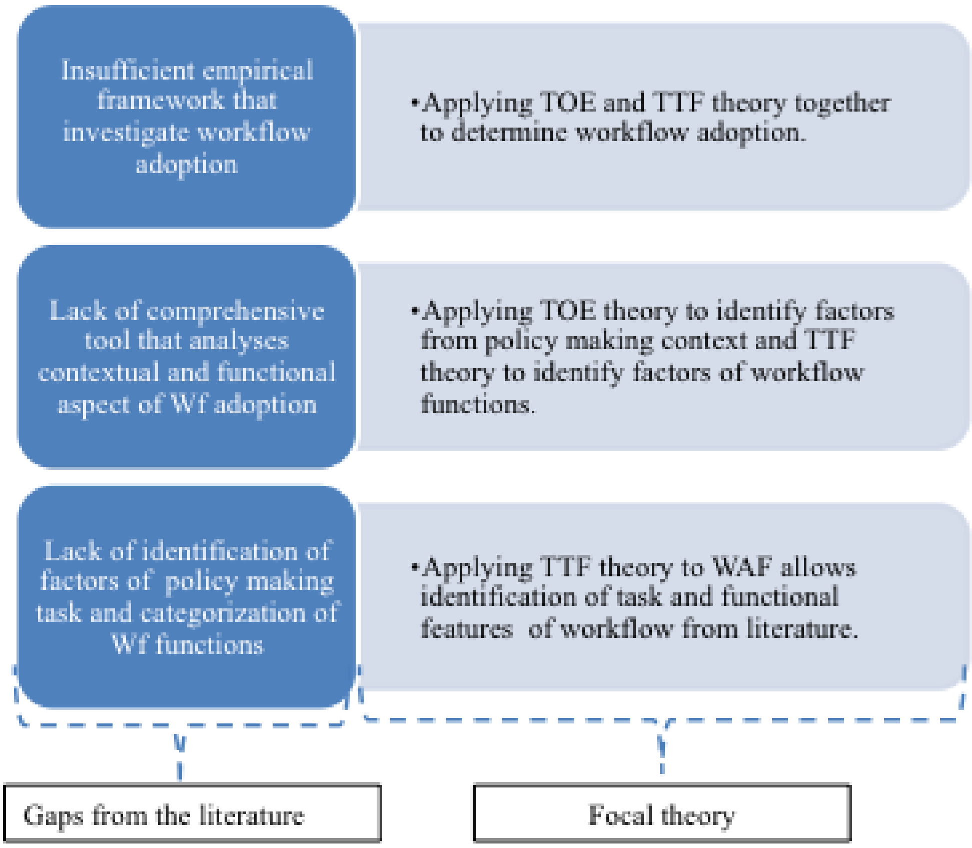

Figure 3.1: Proposing focal theory to fill existing gaps in the literature

The focal theory is supported by a set of propositions, presented in section 3.2.1 and 3.2.2, which helps in developing the conceptual framework. It also directs the research in data collection and analysis. In order to fill the gaps, a novel framework of WfT adoption is developed based on the propositions and presented in section 3.3.

3.1.2 Establishing significance of Adoption theories

As innovation is increasingly being adopted by organisations to achieve better performance (Rogers, 1995), the need to have a tool to support adopters for selecting the appropriate innovation is also high. An appropriate framework, or mechanism, that can encompass the organisational context and technological aspects will allow the adopters to select the right innovation and reduce failures. Context plays an important role in bringing changes to the organisation; as such it can facilitate or impede business processes and functions (Hughes, 2006; Self *et al.*, 2007). It is suggested, in order to understand the phenomena under investigation, it is essential to understand the context that is constantly influencing it (Alajoutsijärvi and Tikkanen, 2002)

From section 2.6, in chapter 2, it can be seen that there are many theories of IT adoption in the IS literature. However, the most important ones are the TOE and TTF theory with respect to the purpose of this research. The rationale behind selecting two theories of adoption rather than one theory or more than two theories is that the workflow technology has never been studied with respect to firm level adoption before. Also, the policy making context is a large process utilising huge amounts of human and informational resources for building policies. The potential context can be seen as complex due to the large number of citizens involved in providing feedback in public consultations and a constant link required between the policy makers and the citizen to produce quality policies. Adopting TOE theory enables this research to identify potential contextual factors that will have an impact on workflow adoption. Therefore, TOE theory allows the researcher to study the complex domain in depth where workflow technology will be adopted.

Studying the contextual aspect helps in understanding the domain but ignores the functional utility of the technology. Therefore, adopting TTf theory to incorporate both domain task requirements and functional characteristics of technology gives a holistic aspect to investigating workflow adoption in the policy making context. Together they serve the purpose of studying a complex context and technology’s functional utility to determine the adoption of workflow technology. Most of the prior theories have discussed either the context or technological functions separately and have not utilised the power of the two together to investigate IT adoption. Figure 3.2, shows the synergy between TOE and TTf theories that establishes contextual and functional phases to determine workflow adoption.

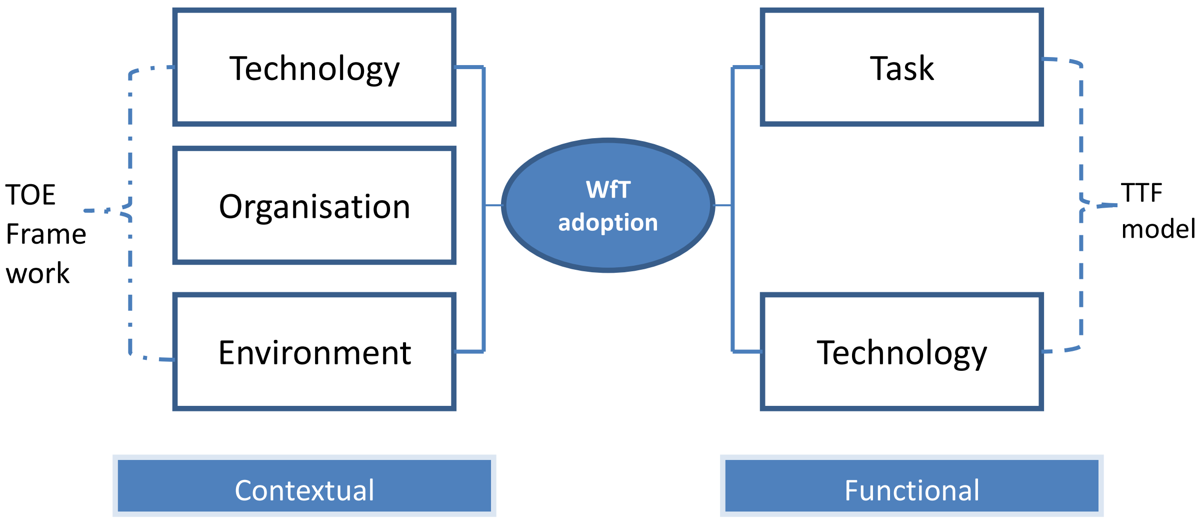

Figure 3.2: Contextual and functional synthesis of workflow adoption

3.2 Proposed Factors for Workflow Adoption

According to the literature review, conducted in chapter 2, it was found that the literature lacks workflow adoption frameworks and hence factors determining adoption have been missing. Therefore, to propose factors for workflow adoption, this study searches for factors of adoption for workflow technology among the applications of TOE and TTF theories in the IS literature.

First, using TOE theory common factors of adoption, which are applicable to most of the information technologies in the literature, are identified. Then, based on TTF theory, functions of workflow technology are selected as potential adoption facilitators. Also, tasks present in policy making processes are identified and from that common characteristics have been abstracted. These characteristics will aid in calculating the fit between task and technology, which will contribute to determining the degree of adoption. Moreover, propositions are presented that help in guiding this study for data collection and the aim is to test rather than to prove these propositions and to come up with final facilitating conditions for workflow adoption.

3.2.1 TOE factors influencing workflow Adoption

Section 3.1, describes factors for different types of IT adoption in the IS literature which have been based on TOE theory application. The tables 2.16 and 2.17 help in identifying the most commonly used and most relevant factors for WfT adoption in the public policy making domain. Factors like managerial support, structure, technology competence, attitude, government regulations, and technological support are found in most of the studies in the literature. However, factors such as corporate culture, organisational slack, business complexity and consumer pressure have been ignored by this theory. Standard factors adopted by the theory may have been expressed and categorised differently under technological, organisational and environmental categories but the underlying rationale for using them is the same. For this study these factors have been selected as factors generally adopted to analyse IT adoption and categorised as technological, organisational and environmental context. As workflow is a technology the author believes that these factors play an important role in determining the adoption level in the public policy domain. Therefore, the author suggests the following proposition:

Proposition 1: Set of Technological, Organisational and Environmental factors affects the adoption of workflow technology in the policy making context.

The above proposition suggests that workflow technology, if applied in the policy making domain, will be either positively or negatively affected by existing technologies associated with policy formulation. An organisation's behavioural and structural aspects can influence workflow adoption or it can create resistance to adoption. Lastly, the external environment where the organisation operates has influence on the policy making process which will either socially or politically enforce or negate the adoption of workflow technology for creating public policies. Together they allow an understanding of the contextual aspect of workflow adoption.

3.2.1.1 Technological context of TOE

Technological characteristics of an IT has an impact on adoption, and this proposition has been empirically tested and the results have shown firm support (thong, 1999; Li 2008; Kuan *et al*., 2001; Rogers, 1995). A meta-analysis by Tornatzky *et al*. (1982) suggests three technological characteristics Complexity, Compatibility and Relative Advantage that are important in understanding IT adoption. The proposition is consistent with Diffusion of innovation theory, which is widely applied to understanding organisational level IT adoption (Rogers, 1983). Drawing on the previous studies, this study adapts these three innovation characteristics for workflow technology.

- **Complexity** refers to the degree an innovation is perceived to be difficult to use (Rogers, 1983). Lack of necessary skills and knowledge to operate a system or adapting a technology will discourage users and organisation from adoption (Thong, 1999). Therefore, the technological sophistication of the organisation should match the new technology as the more complex the technology is perceived to be, the lesser will be the perception of the need for its adoption (Thompson, Ranganathan, & Dhaliwal, 2006). Workflow technology requires some level of IT knowledge, training and technical infrastructure for support. IT knowledge requires human resource to have knowledge and skills to use the technology and infrastructure that will enable the workflow technology to be implemented.
- **Compatibility** in this study is taken as ability of workflow technology to be integrated with existing systems, values and practices. This definition is derived from the study by Zhu *et al.* (2006). Higher technology integration reduces the gap between legacy systems and the new technology. Moreover, improving compatibility increases the responsiveness of an IT (Goodhue *et al*., 1992).
- **Relative advantage** is the degree of benefits a technology can provide to an organisation (Lee *et al.*, 2009). It is important for an organisation to match the benefits of the technology with their organisational goals. The decision to adopt IT by the organisation will be positive if it is able to provide better benefits than existing ones (Premkumar and Ramamurthy, 1995; Thong, 1999). Workflow technology provides many benefits such as runtime efficiency (Zeng and Zhao, 2005; Verbeek and Aalst, 2000), process efficiency (Aguilar-Saven, 2003; Bae, 1999), performance efficiency and cost reduction (Georgakopou and Hornick, 1995; Verbeek and Aalst, 2000; Mentzas *et al.*, 2001). All these advantages of workflow technology will have an impact on its adoption in the policy making domain.

Proposition 1.1: Complexity, relative advantage and compatibility have a positive impact on workflow adoption in the policy making context.

Hence, due to the degree of workflow technology's complexity, relative advantage and compatibility factors, policy makers may decide to adopt or drop the idea of workflow technology for the policy making process. Less complexity, higher relative advantage and compatibility will favour adoption and vice versa.

3.2.1.2 Organisational context

It is important to understand the organisational context to identify the supportive presence within the organisation that initiates the adoption of a new technology. It is the internal characteristics of the organisation that facilitates the easy and fast adoption of innovation. The internal characteristics may be similar among organisations but differ in having an impact on innovation adoption. Therefore, to study some of the important and popular characteristics of an organisation that may be favourable to the adoption of workflow technology is significant for this research. The organisational characteristics that may have impact on workflow technology are:

- **Managerial support** is vital for organisational adaptation and lack of it has resulted in the unsuccessful management of organisational change or adaptation (Roberts *et al*., 2003). Managerial support is provided by amending the negative environment for the new changes to happen successfully through vision, support and commitment (Lee and Kim, 2007). Managerial support refers to management's skills and knowledge that are needed to support organisational change (Zhu *et al.*, 2006; Chong *et al.*, 2009). The integration of complex technology requires managerial skills and IT knowledge (Mata *et al.*, 1995) and failure to demonstrate these can lead to loss of funds, time and wastage of resources. To support the users of technology the top management supports by assigning managers as champions of products or technology to facilitate the adoption process and communicate the benefits of IT (Premkumar and Ramamurthy, 1995). Chatterjee *et al.*, (2009) and Thompson *et al.*, 2006, suggested managerial skills' significance in successful integration of e-commerce that can be used to motivate users to adopt new technology faster.

Furthermore results from the study conducted by Nelson *et al.*, (2003) revealed managerial support as a strong determiner of adopters and non-adopters of innovation. Therefore, considering the managerial support factor in workflow technology adoption is important which is also supported by Grinter (2000).

- **Organisation structure** reflects the activities going on within an organisation because the process of allocating tasks and their coordination and supervision makes up the structure of the organisation (Pugh, 1990). Flexible organisation structure always has room for adaptation in a changing environment, in the integration of innovation and in business process redesign (Zhu *et al*., 2004; Chatterjee *et al*., 2002). The more flexible the structure the fewer obstacles it creates for adaptation and the less cost and interruptions (Goodhue *et al*., 1992; Barua, *et al*., 2004).

  Moreover, the structure facilitates decision making, the flow of information is smoother and the complexity of business processes are reduced (Goodhue *et al*., 1992). This point highlights the significance of structural flexibility for effective IT integration and, in the case of this study, workflow technology. According to Basu and Kumar (2002) a business process structure that is clearly defined and is predictable is the most suitable for workflow implementation.

- **Cost:** There is a general understanding in the literature that IT is adopted by the organisations to reduce cost and improve service deliveries (Byrd and Davidson, 2003; Brown, 2001). Similarly, in recent years government organisations are adopting IT to reduce cost, enhance communication and increase transparency (Beynon-Davies, 2005; Kamal M. , 2006). As much as there is a desire to reduce organisational cost among the LGAs, there is also a technology cost that acts as a barrier to IT adoption (Ebrahim and Iran, 2005). Cost and benefits are among the many common factors associated with IT adoption and should be considered in decision making when IT is adopted (Kamal, Hackney, & Ali, 2013).

- **Attitude:** Among the factors of IT adoption in an organisational context is individual attitude. Attitude has been defined as the positive or negative evaluation of a subject or object (Fishbein and Ajzen, 1975). The study of attitude has been influenced by three definitions, first by Thurstone (1931: 261) who defines attitude as “the affect for or against a psychological object”. Another one defines attitude as the mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related” (Allport, 1935: 8). And, a third one defines it as “a disposition to react favourably or unfavourably to a class of objects” (Sarnoff, 1960: 261). From these definitions one can abstract that attitude is the individual’s resistance or preference for a certain object, idea or an issue. When a new technology is introduced to the organisation that conflicts with the working environment and procedures of the organisation, people tend to show a negative attitude and resist the change (Premkumar and Ramamurthy, 1995).

Attitude is an important factor in IT adoption models such as TAM (Davis, 1989), Theory of Planned Behaviour (Ajzen, 1985), Theory of Reasoned Action (Fishbein and Ajzen, 1975) and Task Performance Chain (Goodhue and Thompson, 1995). Considering its significance in the well-known IT adoption models and empirical evidence supporting attitude to be determinant of IT adoption (Harrison *et al.*, 1997; McGill and Klobus 2009), this study selects attitude as one of the influencing factors for workflow technology.

- **Information intensive** organisations are more prone to IT adoption (Yap, 1990). Porter and Millar (1985) suggested firms that produce products or services which are information intensive should benefit from the strategic use if IT. A similar view was posited by Thong (1999) who advocates higher information intensity which leads business to adopt IT more readily than less information intensity. The policy making process is information intensive as large information collected from the citizens in the form of their opinions is analysed and then policies produced. These policies are made in an information intensive environment and therefore workflow technology adoption as a strategic benefit to facilitate the process is a promising solution.

Proposition 1.2: Managerial support, structure, attitude and information intensity have a positive impact on workflow adoption in the policy making context.

This proposition suggests that existing managerial support will help in adopting new technology and rigidness will immobilize it. The more flexibility that exists in an organisation structure the more it allows easy integration of new technology and the more positive the individual attitude towards innovation and the faster will be adoption. Lastly, organisations that have a large amount of information processing require technology to overcome complications and complexities and reduce time and resource consumptions. Therefore, proposition 1.2 suggests that managerial support, structure, attitude and information intensity will have an effect on workflow technology adoption in public policy making.

3.2.1.3 Environmental context

It is in the external environment where the organisation exits and it is affected by socio-political conditions. An organisation faces pressures from the environment and thus at times can shape the characteristics of the internal environment of the organisation. Two of the important factors of the environment impacting on the organisation are government regulations and competitive pressure. Together these can bring changes to an organisation and push for innovation adoption.

- **Government regulations** have been seen in the literature as an important environmental factor that influences IT adoption among organisations (Kaun and Chao, 2001; Zhu *et al*., 2006b; Pan and Jang 2008, Li, 2008; Zhu *et al*., 2003, 2004). Government policies place pressure on organisations in industry to be more compliant with regulations such as to be more paper free, recycle, maintain standards, have a culture of transparency etc. Government regulations that are restrictive in general create low motivation to adopt IT (Zhu and Kraemer 2005) and a supportive regulatory environment facilitates IT adoption (Ebrahim and Iran, 2005). Therefore the supportive or restrictive influence of government regulations is considered as an important factor that can promote or deprive Wf adoption in public policy making.
- **Competitive pressure** has been emphasised in the literature for its strong impact on IT adoption (Rogers 1995; Premkumar and Ramamurthy, 1995; Crook and Kumar, 1998). Research illustrates that as competition increases in the business environment, adoption of innovation is increased (Kimberly and Evanisko, 1981; Utterback, 1974; Link and Bozeman, 1991). In order to compete with competitors in the market runtime efficiency, product quality, reducing cost and similar factors

are approached which are supported by IT. Also, to achieve competitive advantage firms always seek new innovations to lead the market (Thong, 1999).

Proposition 1.3: Government regulations and competitive pressure have a positive impact on workflow adoption in the policy making context.

Proposition 1.3 proposes that policy makers will be influenced to adopt workflow technology due to competitive pressure and if government regulations demand. These two factors can have a positive impact on Wf adoption and, therefore, it is important to analyse its effect on Wf adoption in the policy making domain.

3.2.2 TTF factors influencing workflow adoption

As proposed by Task-Technology-Fit theory, technology characteristics must match task requirements for its successful adoption. By using TTF theory this study identifies significant functions of workflow technology in section 2.4.3 of the literature review and considers it as context relevant to workflow characteristics. Abundant evidence is present in the literature where studies have adopted technology's functional features as characteristics and analysed the fit with tasks (Zigurs and Buckland, 1998; Dennis *et al.*, 2001).

3.2.2.1 Proposed functional factors of workflow technology

Functional factors are the key features of the technology that help in performing certain tasks. These features play a significant role in technology adoption by allowing the performer to use the technology's features for carrying out tasks in a precise, fast and convenient way. The following are the selected functions of workflow technology to be studied for this research.

- **Collaboration** of resources and systems is required in a business process to achieve set goals. Workflow technology allows the exchange of information, task dependencies and achieving collaborative goals in a business process (Georgakopoulos, *et al*., 1995). It creates a network environment for information sharing (Cardoso, Bostrom, & Sheth, 2004; Lin, Ho, Sadiq, & Orlowska, 2001). The policy making process requires similar activities and a mechanism that can provide such collaboration will motivate its adoption. Workflow technology can improve collaborative work not only between departments in the organisation but also between the policy makers and citizens by collaborating tasks, systems and various feedback platforms. The collaboration function of workflow suits policy making tasks and, therefore, it may prove to be an important influential factor of workflow adoption.

- **Coordination** is an important function that takes place within organisations and between organisations for achieving set goals. Workflow technology provides a coordination function to minimise in valuable activities and human resource can be put to more valuable tasks. It manages tasks during the business process by assigning them to the right actor at the right time. Therefore, coordination between the participants and information resources are efficiently handled by adopting workflow technology (Lousa *et al.*, 2000; Georgakopoulos, *et al.*, 1995). For the policy making context, efficient coordination is a useful function that can handle tasks and information resource coordination in the policy making process.
- **Information processing** is taking information stored in the form of data or documents as an input and transforming it into output that allows the achievement of set goals. Section 2.2 suggests, policy making is information intensive and all the activities carried out are processing information. As defined in section 2.4, workflow technology processes information by exchanging, distributing or producing and is highly information intensive in processing. Mostly in the policy making process information is collected, analysed, generated and distributed. Therefore, information processing is one of the core functionalities of workflow technology, and it has been selected as a functional factor in this study.
- **Role resolution** is the ability of workflow technology to assign roles among the actors in a business process that reduces execution time, conflict and cost. It automatically assigns tasks to workers according to the set conditions (Cheng, 2000). This ability of workflow technology is significant when policy making is considered. Not only from the administrative side, but from the external participant’s perspective as well, it can qualify them for appropriate roles and facilitate efficient contribution to the policy making process (Lee *et al.*, 2011).

Considering role resolution as an important influencing factor for workflow adoption will lead to the development of a rigorous framework.

- **Automation** has played an important role in technology evolution. Every business desires some level of automation to ease the load on workers, reduce costs, improve time efficiency and achieve greater output. Workflow technology allows the automation of business processes by working with workflow management systems (Georgakopoulos, *et al*., 1995; Aguilar-Saven, 2004). Such a functional attribute is beneficial for the policy making process by allowing process automation. Providing access to information, automatic delivery of policy issues to citizens and collecting feedback and much more can be automated with the help of workflow technology. Hence such a favourable feature of workflow cannot be ignored and has been added to significant factors influencing workflow technology adoption.
- **Controlling** of information flow, specifying and reporting tasks are also very important for any business desiring runtime efficiency. Workflow includes a mechanism which allows the automated controlling of information flow, execution of tasks and delineating roles. Process control is one of the motivational factors of workflow adoption (Stark and Lachal, 1995) and thus has been selected for this study.
- **Monitoring** is essential for the smooth execution of business processes and productive output. Also, for continuous improvement, the monitoring function allows the detection of errors, on time delivery of tasks and quality of output (Aalst, 2001; Georgakopoulos, *et al*., 1995). Hence, for the policy making process, the monitoring function is a prerequisite for producing good quality policies, increasing process and time and resource efficiency. Therefore, the monitoring factor may have impact on workflow adoption in the policy making context.

In order to widen the understanding of the functions of workflow technology, this study further divides the functions of workflow into more abstract dimensions. Collaboration and coordination functions allow information to be shared between individuals from various locations within and outside the organisation. Hence, such a functional support is classified as communication support. According to Zigurs and Buckland (1998) and

Dennis, *et al*., (2001) the communication function of a technology supports or enhances communication between the participants allowing sharing of information and input. WfT‘s ability to allow users to access information and collaborate on task activities from different sites is an example of communication support. A function such as role resolution identifies and authorises individuals to perform the task and controls the flow of task activities and information. Additionally, monitoring the task from inception to completion for errors and quality management defines the process structure of the business. Automation support of workflow technology manages the entire or partial business process with minimal manual interference. Such ability of the technology to define who will perform what task and according to what set conditions can be said to have process structuring support similar to that defined by Zigurs and Buckland (1998), Nunamaker *et al*., 1991 and Dennis, *et al*., (2001). The classification of workflow technology functions is presented in table 3.1. For a more general understanding and wider application of WfT features table 3.1 consolidates sub-functions into abstract functional terms. It describes how these features support the business process of an organisation by carrying out important tasks. It also shows how previous studies have described these functions as technology dimensions.

Technology dimensions					
WfT features (Concrete)	*Abstract terminology*	*Description of WfT structures*	*Zigurs and Buckland,*	*Nunamaker et al., 1991*	*Denis et al., 2001*
Sharing, Co-ordination, Collaboration,	Communication support	Supports or enhances communication among participants	Communication support	Process support	Communication support
Information processing	Information processing support	Supports the evaluation, gathering structuring information	Information processing support	Task structure	Information processing support
Role resolution, control, monitoring, automation	Process structuring support	Defines the process by which the group works on the task.	Process structure	Process structure	Appropriation structure

Table 3.1: Workflow technology functional classification

3.2.2.2 Proposed policy making task characteristics

This study defines task characteristics that are common among the various business processes of local government authorities. These task characteristics are widely present in policy making processes, however, they have not been classified before and are presented in table 3.2.

Authors	**Task characteristic (PMP)**	**Description**	**Examples**
McGrath 1984; Straus and McGrath, 1994; Zigurs and Buckland 1998; Dennis *et al*., 2001.	Generation	Task activities that generate ideas/information.	Publishing policies, consultations and providing information to citizens.
McGrath 1984; Straus and McGrath, 1994; Zigurs and Buckland 1998**;** Dennis and Valacich, 1999; Dennis *et al*., 2001.	Choice	Decision making tasks or making selections from a set of alternatives.	Policy creation, selecting initial policies and other selecting activities.
Dennis *et al*., 2001	Combination	Tasks that require both generation and choice activities.	Conducting analysis and monitoring.

Table 3.2: Policy making task classification

Generation is a task activity that has flow of information from one participant to another and that is solely generating ideas (Dennis, *et al.,* 2001). Such an activity is commonly found in business processes in both private and public organisations. The policy making processes described in section 2.2.3.4, suggests that agenda setting is a stage in the policy making process that generates ideas for agendas. This is normally done by the policy makers and sometimes ideas are collected from the citizens. These tasks are simple in nature as they seek only a single outcome. Technologies such as group support systems have been studied to evaluate the fit between technology functions and task requirements, which classified task characteristics and are widely adopted (Zigurs and Buckland, 1998; Hollingshead and McGrath, 1995). One of the most commonly cited task charcterisitcs is generating a task which is similar to the simple task suggested by McGrath, (1984), Hollingshead and McGrath, 1995 and Zigurs and Buckland, (1998). It is suggested that it is beneficial to have communication support to allow the exhange of information and ideas between the participants. Dennis, *et al*. (2001) studied the effects of group support systems on performance and characterised tasks as generation, choice and combination. The study suggested verbal and electronic communication support for generation tasks.

Choice is another generic characteristic found among most of the business process tasks. It is the task responsible for making a selection from a given set of alternatives or more precisely a decision making activity (Dennis, *et al.,* 2001). Zigurs and Buckland, (1998) has defined one of the task charcteristics as a decision task that has the activity to provide solutions to best meet multiple outcomes. In the policy making context, a task that entails activities such as analysing and creating policies involve decision making tasks. Due to the information intenisty involved in the task and evaluation steps involved in decision making, such an activity requires information processing and process structuring support from an IT (Zigurs and Buckland, 1998).

Combination is the third task characteristic that describes a task that combines the generation of ideas and decision making at the same time (Dennis, Wixom, & Vandenberg, Understanding Fit and Appropriation Effects in Group Support Systems via Meta-Analysis, 2001). Combination of task characteristic becomes apparent during the analysis stage of the policy making and monitoring stages. In general, business processes with activities to analyse are commonly found in reporting, evaluation of employees and business opportunities. Zigurs and Buckland, (1998) defined higly complex tasks as fuzzy tasks which require the generation of ideas to analyse and solve problems. They suggested that for fuzzy tasks communication support, information processing support and some level of process structuring support is required to best meet the task needs.

From this discussion of task characterisitcs, this study further devlopes its proposition to guide this research in data collection and analysis.

Proposition 2: The fit between task characteristics (generation, choice, combination and collection) and technology functions (Communication support, Information Processing and Process Structuring support) has a positive impact on workflow adoption in the policy making context.

As the previous propositions have focused on organisational contextual perspectives, proposition 2 focuses on the functional context of the technology to analyse adoption. It suggests that the workflow technology functional capabilities and policy making task requirements will have a positive impact on adoption. The more close the fit between the task requirements and workflow functions the more readily will be the technology adopted. Policy making task characteristics have been defined in this thesis that helps in analysing the fit between workflow technology functions and task requirements. Policy makers will be initiated to take on workflow technology if the task characteristics can be well served by workflow functional capabilities and vice versa.

Table 3.3, compiles all the factors affecting adoption of workflow technology in this study along with the propositions. Also, definitions have been derived to show the exact implications of these factors to be studied in this research.

Context	Factors		Definition	Authors	Proposition	
Technological	Complexity		The degree to which innovation is perceived to be difficult to use	Rogers, 1983	P1.1	P1
	Relative advantage		The degree to which an innovation is considered to be better than precursor	Rogers, 1983		
	Compatibility		The degree to which a technology is integrated with existing systems, values and practices	Zhu *et al.*, 2006		
Organisational	Managerial support		Managerial skills and knowledge to support organisational adaptation	Roberts *et al.*, 2003	P1.2	
	Structure		Activities of task allocation, coordination and supervision of a business	Pugh, 1990		
	Attitude		Resistance or inclination towards class of object	Sarnoff, 1960		
	Information intensity		The degree of information presence in a product or service	Thong, 1999		
Environmental	Competition		Business environment where the business operates	Thong, 1999	P1.3	
	Government regulations		Imposition of rules by government	OECD, 1993		
Functions	Communication support	Coordinat-ion	Managing and facilitating exchange of information	Georgakopoulos and Hornick, 1995	P2	
		Collaborat-ion	Cooperating and supporting tasks, information and systems	Bae, 1999		
	Process structuring	Role resolution	Qualifying mechanism for assignment of roles to workers	Zeng and Zhao, 2005		
		Automat-ion	Computerised programming of tasks execution and implementation of rules	Georgakopou and Hornick, 1995		
		Monitoring	Detecting errors and correct execution of tasks	Koulopoulos , 1995		
	Information processing		Using information to achieve desired goals	Mentzas *et al.*, 2001		
Task	Choice		Tasks involving decision and selections	Denise *et al.*, 2001		
	Generation		Tasks that producing ideas and alternatives			
	Combination		Tasks that have both attributes of choice and generation			

Table 3.3: Workflow adoption factors

3.3 Initial Conceptual Framework for Analysing Workflow Adoption in Policy Making Context.

The current research has reviewed previous studies, related to the key concepts highlighted in this study, with the purpose of identifying important issues, gaps and to provide more insight into the related concepts. This information helps in developing an initial framework for workflow adoption in the policy making context to guide the current research. The study needs to select key factors of workflow adoption, elaborate and conglomerate them in such a manner that will lead to a unified empirical study to capture a holistic view of workflow adoption in the policy making context. Therefore, the author argues for the association underlying in combining of the two theories (TOE and TTF) for explaining the workflow adoption phenomenon. The study adopts the following steps in developing the initial framework:

First step, the use of a theoretical perspective has been justified and table 2.16 and 2.17 provides an application of the two perspectives in the literature, technologies applied and variables selected. This helps in understanding the concept behind the theories and how it can be adopted for further technologies. Learning from the past studies, it highlights TOE and TTF theories as key concepts for understanding workflow adoption in the policy making context. These concepts hold dimensions and factors that help in understanding the adoption of technologies. The two theories together can explain two important perspectives for adoption, context (organisation, environment, and technologies) and utilization (task technology fit).

For the current study, it is important to understand how much the context of organisation plays a role in the adoption of workflow technology and how well the technology itself can match an organisation’s tasks. By combining these two theories in one framework it will allow the understanding of the adoption of workflow technology, particularly in the policy making context. This framework can be seen as an appropriate approach to analysing the totality of factors of adoption for workflow technology. This is justifiable, as the initial framework not only integrates influential elements from the environment, organisation and technology but also the functional attributes of technology and activities within the application domain. The two perspectives form the basis for the research investigation and help in developing the initial framework.

Key theoretical perspectives of workflow adoption framework		
	TOE theory	*TTF Theory*
Justification (Purpose)	TOE theory helps in explaining specific context in which the adoption process takes place. It helps in analysing factors that affect tendency to adopt and specific environmental and technological conditions of the organisation.	TTF theory helps in explaining utilization of the technology based on the fit between its functions and target task requirements. It helps in evaluating the adoption of technology based on its features and task requirements.
Theoretical dimensions (Main factors)	Three dimensions influencing the process of adoption: external environmental context, organisational context and technological.	Two dimensions explain the adoption process: set of task characteristics and set of technology characteristics.
Impact on adoption (Phenomenon)	Identification and evaluation of main contextual factors having an effect on the propensity to adopt workflow technology.	Identification and evaluation of main functional factors having an effect on the propensity to adopt workflow technology.
Supporting research	Kaun and Chau, 2001; Chau and Tam 1997; Zhu *et al.*, 2003	Goodhue, 1995; Goodhue and Thompson, 1995; Zigurs and Buckland, 1998

Table 3.4: Key theoretical perspectives of workflow adoption framework

Second step, table 2.16 and 2.17 also highlights that TOE and TTF theory has not been applied in workflow arena, which also emphasise the fact that there is a lack of conceptual and empirical research on the contribution and application of the two theories together in the workflow domain. The lack of empirical research on workflow adoption motivates this study to fill the gap and after reviewing extant studies on adoption of IT/IS, this study focuses on integrating the two selected theoretical perspectives to form the Wf adoption framework.

The study also suggests the most appropriate and common factors from the literature on TOE and TTF as potential factors influencing workflow adoption. The research argues that the key theme of this study, adoption of workflow phenomenon, is influenced by several properties of the factors belonging to the two theories. From TOE theory organisational factors have influencing properties such as managerial support, structure, user attitude and information intensity, while technological factors have compatibility, complexity and relative advantage and environmental factors have governmental regulations and competitive pressure. On the other hand, TTF theory exhibits workflow functional factors (role resolution, control, collaboration, automation, coordination, information processing and monitoring) and task factors (generation, choice, combination and collection). These characteristics of the main factors of two theories will help in determining the adoption level of workflow technology in the policy making domain. Such factors have not been collected before, particularly for analysing workflow technology, and allow this study to investigate the novelty underlying the themes for the contribution to workflow knowledge.

The third step of this study proposes propositions to support the research issues mentioned in section 3.1 and the gaps highlighted in chapter 2. The research issues identified highlight empirical testing of TOE and TTF theory for workflow adoption in the policy making context. On the theoretical and empirical side, TOE and TTF theories have been applied to IT adoption, however, the potential of the two theories in combination has not been tested before. Also, the two theories have not been applied to workflow adoption in the past. Therefore, to guide through the research phase for developing a conceptual framework for workflow adoption, the present study has proposed propositions (section: 3.2.1, 3.2.2 and 3.2.3). They further guide research in data collection of the study, analysis focusing on the research phenomenon (Perry, 1998: p.791), determine impact of the factors and their characteristics on workflow adoption and associations underlying in the framework.

Past studies in workflow application have focused on workflow models, standards, systems development etc., which have encouraged quantitative research from the methodological side. The researcher argues that there is a need to develop a robust research design and analysis based on influential elements of workflow adoption that will provide insight into the qualitative aspects of workflow technology.

The proposed propositions allow the analysis of workflow technology from the two perspectives (TOE and TTF) in the policy making context to draw meaningful conclusions for advancing existing knowledge of workflow adoption. Table 3.5 describes the association between current research issues, limitation of existing literature to support workflow adoption based on the two theories (TOE and TTF), proposed propositions to support the research issue, filling gaps in the literature and ignorance of previous research focusing on IT and not considering workflow technology.

Current research issue	**Extant research limitation**	**Present research (research propositions (P))**	**Previous research**
How do key TOE dimensions have impact on workflow adoption in policy making context?	Lack of TOE theory application to workflow adoption	P1: Technology, Organisation and Environment dimensions have an impact on workflow adoption in policy making context. (Section 3.2.1)	Chau and Tam 1997; Thong 1999; Kuan and Chau 2001; Pan and Jang 2008
	Lack of Technology factors impacting workflow adoption	P1.1: Complexity, relative advantage and compatibility are factors of Technology dimension and have an impact on workflow adoption in policy making context. (Section 3.2.1.1)	Thong 1999; Li 2008; Lee *et al.*, 2009; Chong *et al.*, 2009
	Lack of organisational factors impacting workflow adoption	P1.2: Managerial support, structure, attitude and information intensity are factors of Organisation dimension and have an impact on workflow adoption in policy making context. (Section 3.2.1.2)	Li 2008; Lee *et al.*, 2009; Chong *et al.*, 2009
	Lack of Environmental factors impacting workflow adoption	P1.3: Competition and government regulations are factors of Environment dimension and have an impact on workflow adoption in policy making context. (Section 3.2.1.3)	Pan and Jang 2008; Rogers 1995; Kamien and Schwartz 1982; Wang *et al*. 2010; Lin and Lin 2008
How do key TTF dimensions have impact on workflow adoption in policy making context?	Lack of TTF theory application to workflow adoption	P2: Task Technology Fit dimensions have an impact on workflow adoption in policy making context. (Section 3.2.2)	Dishaw and Strong, 1999 Klopping and Mckinney 2004; Wu *et a.l*, 2007

Table 3.5: Proposed propositions for current research

The framework is developed based on the key themes and propositions, which will provide decision makers with a tool for analysing the adoption of workflow technology. The proposed framework postulates that workflow technology will be adopted in public policy making context because of the impact of organisational, technological and environmental factors. These factors together have contextual impact on adoption whereas the fit between workflow functions and policy making task characteristics will have technological impact on adoption. By combining TOE and TTF factors the proposed framework produces a novel contribution to knowledge. These factors have not been identified in the literature before for workflow adoption in the public policy making domain that will facilitate policy makers in decision making. Considering the contextual and technical impact on adoption proposition 1 and 2 links the two theories together with workflow adoption. Together they make the proposed model a highly robust instrument of evaluation and analysis of workflow adoption in the policy making domain.

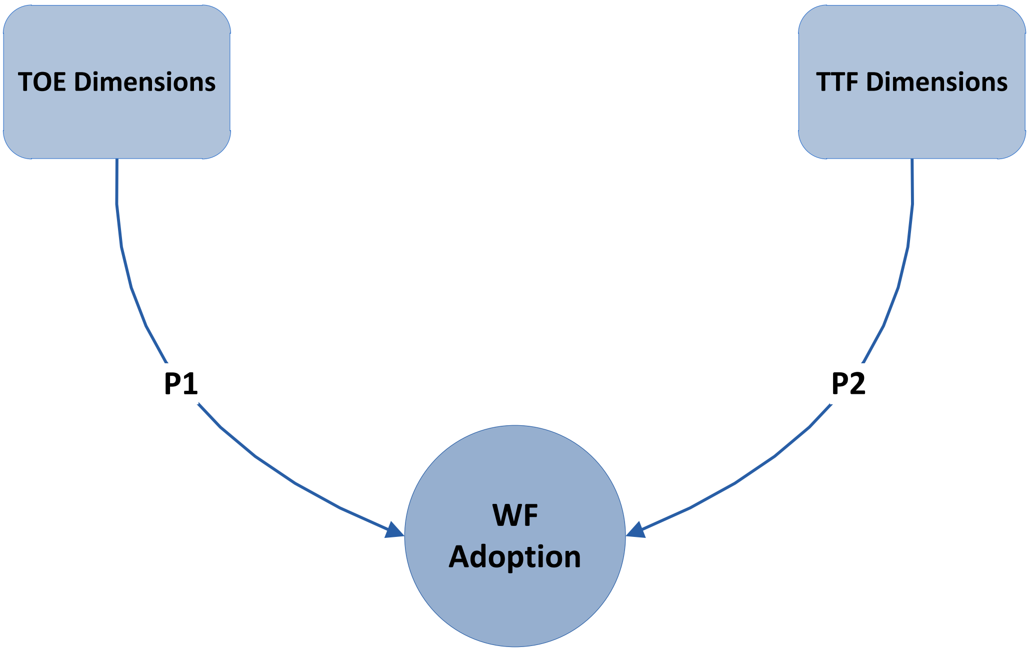

Figure 3.3: Impact of TOE and TTF dimensions on adoption

Further the two theories have been investigated for factors responsible for the overall effect that each theory has on adoption. Figure 17, describes each dimension of technology, organisation and environment theory along with the relevant factors which play an important role in creating an impact on the adoption phenomenon. These factors have been adopted in the literature of investigating adoption phenomenon among varied IT/IS solutions, however; they have not been identified as relevant to workflow adoption which lends an opportunity to this study for further research. By identifying each factor from the literature and applying it in the workflow context will allow the author to distinguish between factors that are important to leaving an impact on adoption and those that are not relevant. This will further help in collecting data and analysing the impact on workflow adoption in the policy making domain. Propositions 1.1, 1.2, 1.3 link these important factors to the adoption of workflow technology and describe them as factors of TOE dimensions. Together they provide a contextual perspective for studying workflow adoption in the policy making domain; however the technological functional perspective lags behind.

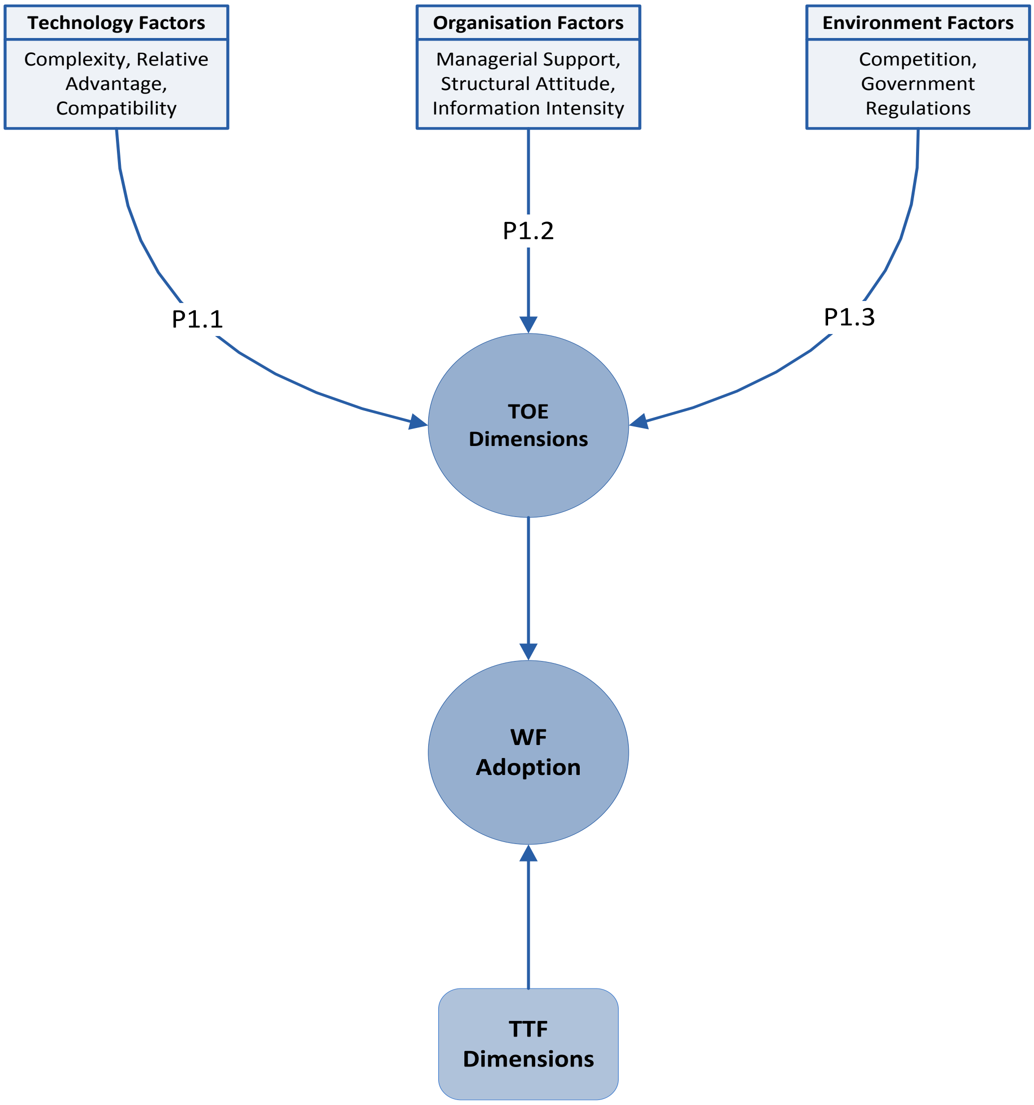

Figure 3.4: Impact of Technology, Organisation, Environment dimensions on adoption

Therefore, to have a holistic understanding, a functional perspective of workflow technology has been incorporated in the framework. After a thorough literature review, workflow technology's major functional abilities have been selected, which are believed to have an impact on the adoption of the technology. Staying true to the concept of TTF theory, task characteristics have been identified and presented as policy making task characteristics. Having both functional features of workflow technology and policy making task characteristics helps in finding a relationship between the technology and task requirements. As suggested by TTf theory, any fit between the functions and the task would lead to adoption. Therefore, to analyse if workflow technology features play any role in the adoption phenomenon, such functional characteristics have been integrated to the conceptual framework, also to find out if any task characteristics impede or facilitate the workflow adoption process or not. Proposition 2 links technology functions and task characteristics with the adoption phenomenon for a better understanding of the adoption process.

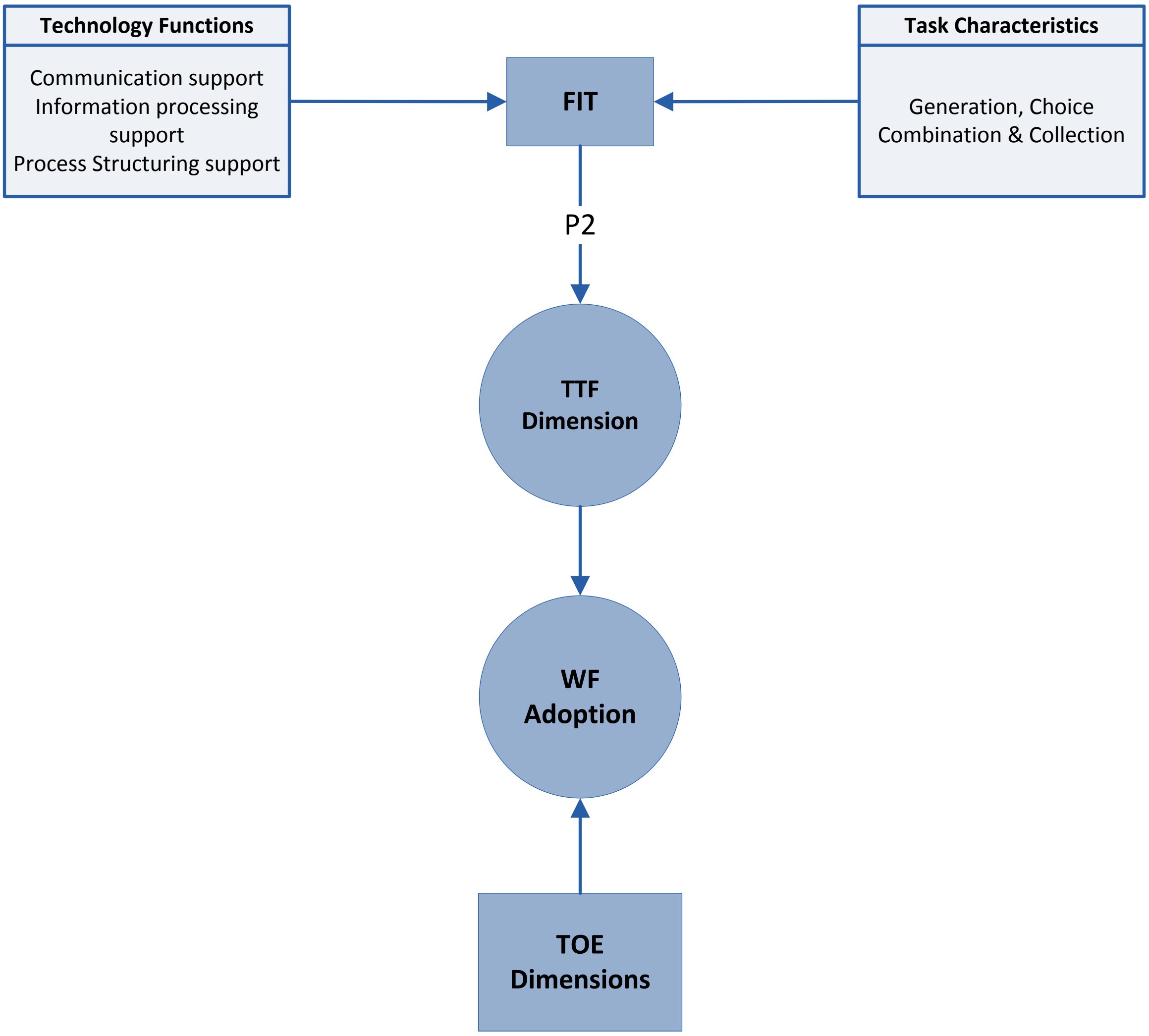

Figure 3.5: Impact of technology functions and task characteristics on adoption

Lastly, by amalgamating the proposed propositions, it leads to a conceptual framework (figure: 20) for understanding workflow adoption in the policy making context. It includes potential factors that may have an influence on the adoption of workflow technology and provides a tool for evaluating the adoption process in the policy making context.

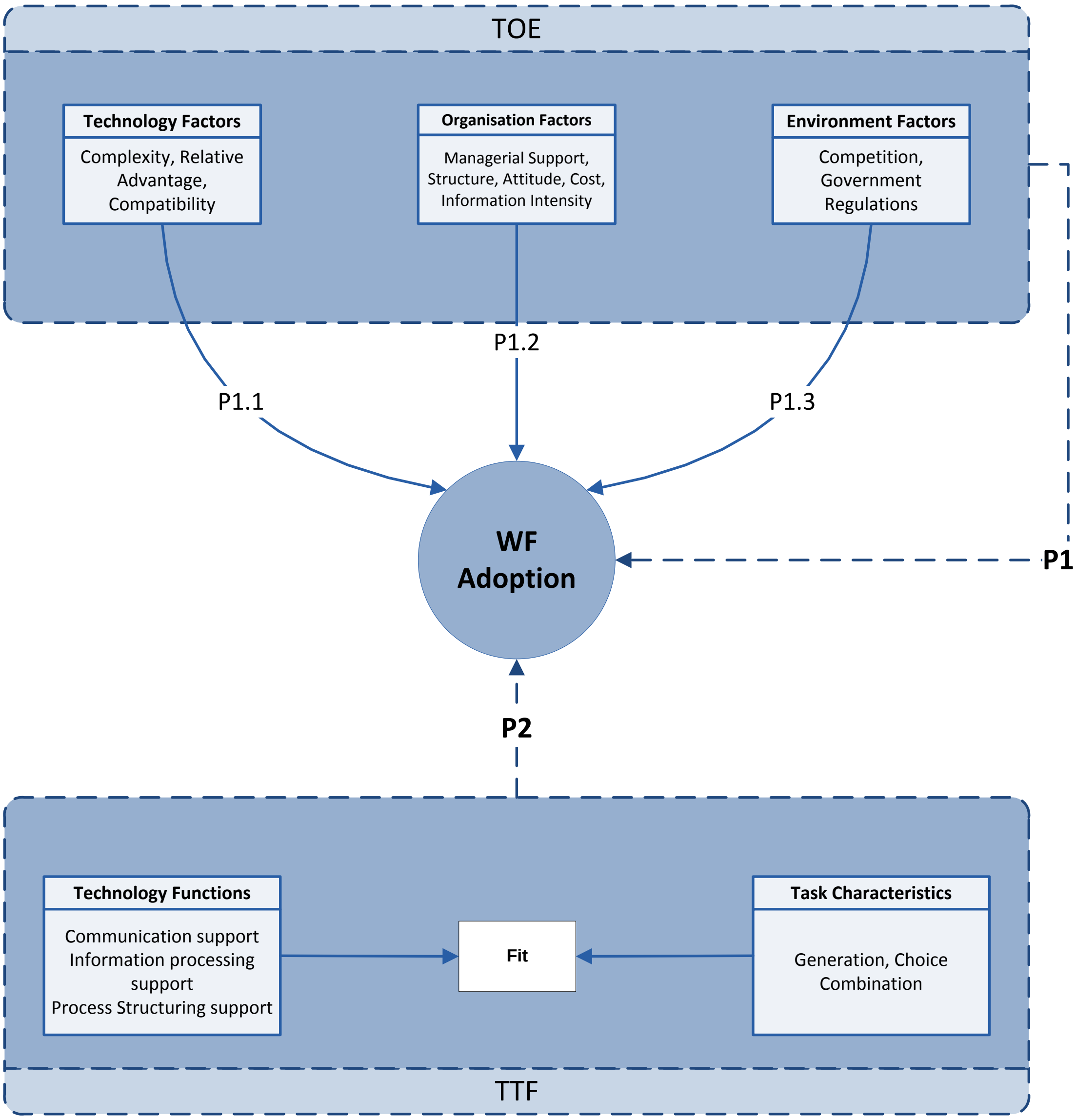

Figure 3.6: Proposed conceptual model for Wf adoption in public policy making

3.4 Conclusions

Chapter 2 identified gaps in the literature regarding the workflow technology adoption framework and particularly adoption in the public policy making domain. One of the reasons attributed to the lack of a theoretical framework is insufficient empirical research from the organisational and behavioural side. Most of the research is focused on studying the technical aspects of WfT leaving an opportunity to investigate the socio technical and organisational factors. In order to fill the gap and provide a novel contribution, this study proposes a WfT adoption framework. However, due to the limited research available in IS and policy informatics to develop and propose an adoption framework for WfT created a limitation. Therefore, a review of IT adoption models found in the IS literature that have been adapted, applied and modified for different technologies such as web technologies, ERPs, Group Support Systems, EAIs and e commerce provided the ground work for a WfT adoption framework. Studying the adoption of these technologies highlighted some common contextual factors, which have also been assumed for workflow technology in this study. This approach was supported by empirically tested and largely applied, Technology-Organisation-Environment theory, and additional factors of adoption were generated through applying Task-Technology-Fit theory to analyse the phenomenon from social- technical and organisational perspectives.

To effectively apply Task Technology fit theory, policy making tasks and WfT functional characteristics are required to be identified. Therefore, a review of the policy making process in chapter 2 highlighted the Macintosh policy making cycle as the most generic model. Considering it and identifying different tasks in policy making generated task characteristics. WfT's functional characteristics were identified from past studies, which suggested functions of workflow technology as the major technological characteristics. Integrating the two theories created a synergy producing factors that may have an impact on workflow adoption.

Propositions have been stated to support the development of an initial framework and for further data collection and analysis. To test the validity and effectiveness of the proposed framework, the researcher believes that it is vital to find out if the proposed factors are sufficient in number and are able to influence the decision making process for workflow adoption in public policy making.

The proposed framework can be used to further investigate and evaluate WfT adoption in other organisations and as a tool for the decision makers to make rigorous decisions about whether to adopt WfT or not.

Following points summarize the concluding remarks of this chapter:

- The gaps in the background theory lead to the application of TOE and TTF theories in the policy making domain. By exploring the potential of these theories within the policy making domain it allows exploring the contextual and functional perspective associated with workflow adoption in the policy making domain.
- The background literature also indicates that there is a lack of a suitable framework for workflow adoption and empirical study in the policy making domain. Adopting the two selected theories helps in identifying workflow adoption influential factors from the contextual and functional perspectives. By collecting these potential factors and organizing them together provides a tentative workflow adoption framework that may help policy makers in decisions on workflow adoption.
- The collective impact of the framework is for a recommendation tool for decision making process and provides theoretical contribution by testing and validating the framework in an empirical investigation that can further be applicable to other contextual domains.

The next chapter presents the research methodology used to test the initial conceptual framework for workflow adoption and address some research issues for further investigation.

CHAPTER 4:RESEARCH METHODOLOGY

4.0 Introduction

This chapter aims to further develop this empirical research by designing the research methodology to meet the aim, objectives and research questions of this study. Hence the research's strategy, overall plan and process of conducting the study are discussed and justification for choosing the philosophical, epistemological and methodological stance in this study is presented. Furthermore, the benefits of using a qualitative approach for this research are identified and a comparison between quantitative and qualitative approaches is presented. After selecting a qualitative paradigm as an appropriate research tool for this study, in section 4.3.1, it further adopts the case study method for data collection. An exploratory interpretive case study method is selected after considering Yin (2009) and Saunder *et al.*'s (2000) classification and justifications for each case study type. Furthermore, a multiple case study approach is adopted for empirical inquiry

The rationale for selecting the data collection method is provided with elaborated reasoning for selecting the interview method, documentation and participant observation as multi method techniques. Lastly, the case study protocol is presented which acts as an action plan for collecting empirical data from each case study.

4.1 Research Philosophy

There are three perspectives that help in developing or improving knowledge, ontology (what is the form and nature of reality?), epistemology (what is the relationship between the inquirer and what is known?) and methodology (how can the investigator acquire knowledge?) in research (Guba and Lincoln, 1994). The consistency between the three paradigms is important for the success of the theory building. According to Saunders, *et al.* (2003) research process is like an onion with four layers. These layers are research philosophy, research approach, research strategy and time horizon. Research philosophy is shaped by the ontological and epistemological stance held by the investigator. Ontology relates to the nature of reality that the researcher is dealing with. There are two positions that can be held in ontology, objectivism and subjectivism. The stance of objectivism indicates the existence of a reality independent of social actors' influence and subjectivism see reality as being the result of the perception of social actors and consequent actions (Saunder *et al*., 2007). Therefore, objectivism sees observable social entities as unaffected by social interaction and can be measured by quantifiable observations. On the contrary, subjectivism attaches meanings and understandings of social actors to the social entity that changes due to these attachments. Ontology allows an understanding of the role of the phenomenon that is under investigation and guides further research development. To understand what is the acceptable and important knowledge for investigation, Bryman and Bell (2007) suggests there are three main streams of epistemology; positivism, realism and interpretivism. These have been presented and explained in table 4.1 along with their properties.

Research philosophy	**Description**	**Properties**	**References**
Positivism	Describes reality as objectively given and independent of social actors that explains a phenomenon through measureable variables.	Hypothesis testing, quantifiable measures of variables and formal propositions Produces law like generalized results (replication) Seeks to test theory Deductive approach	Bryman and Bell (2007); Walsham (1993); Orlikowski and Baroudi (1991)
Realism	Describes reality as independent of human thoughts and beliefs	Relates to objectivist approach to social science Mixture of positivist and interpretivist approach	Saunder et al. (2003); Yin et al. (2003); Burrell and Morgan (1979)
Interpretivism	Describes and interprets a phenomenon through the meanings and perceptions people attach to it which explains context of entity and the way entity influences or is influenced by the context.	In depth understanding of the phenomenon. Produces qualitative data Theory building approach Inductive approach	Saunder et al. (2007); Yin et al. (2003); Orlikowski and Baroudi (1991)

Table 4.1: Description of epistemological stances and their properties

Positivism’s philosophical stance deals with social reality just as natural science does and analyses it using quantifiable results. Statistical analysis extends the results that can become generalised so that they become law like (Remenyi *et al.*, 1998). On the other hand interpretivism’s stance is the opposite of positivism. It suggests organisations are made out of social construction (Saunders *et al.*, 2007). It is the result of the constant change taking place in the perceptions and actions of social actors that gives shape to social entities. Distinguishing the position of positivism from interpretivism can be explained with an example. For example, to study the productivity gained by adopting specific software, it can be done but identifying quantitative variables that describes how software influences social actors; on the contrary, interpretivism would study perceptions and opinions of social factors that may somehow influence the software. Realism like positivism is a scientific inquiry for knowledge development (Saunders *et al.*, 2007). It states reality exists despite of human knowledge of it. However, for the purposes of this study the interpretive approach is the most suitable paradigm. This is justifiable as this study seeks to identify factors that will promote workflow adoption in the policy making context.

The following points highlight the justification for applying an interpretive approach in this research.

- To study workflow adoption phenomenon in the policy making context makes the unit of analysis the complex, socially constructed organisation where the perception and opinion of the decision makers are important, as it will have influence on the adoption of the technology. The interpretive approach is suitable when the phenomenon occurs in a complex environment as it allows a detailed understanding. The workflow adoption framework in chapter 3 applies contextual and functional domains to analyse the adoption phenomenon that explains the interaction of context (social actors' influence) with functional aspects. Workflow adoption is not independent of social actors and it is affected by the meanings and understanding of decision makers which are attached to workflow adoption. Therefore, adopting the interpretive stance will allow the researcher to study empirically and in a more holistic view the organisation's decision making process in workflow adoption through in-depth investigation, observations and face-to-face contact. Also, it allows the exploration of the factors that promote workflow adoption in its natural setting.
- Chapter 3 highlights organisational, technical and environmental as well as influential areas for the adoption of workflow technology. This implies that knowledge of workflow adoption cannot be attained in an independent form and hence the positivist approach fails to serve the purpose of this research which suggests knowledge consists of facts that have independent value. According to

Orlikowski and Baroudi (1991) the positivist approach is applied when there are hypotheses to test, scientific measures of variables or studying a phenomenon within a specific sample. Hence, the positivist approach cannot be applied to this study, as there is no research hypothesis that needs to be proven or variables that require statistical testing. The propositions have been developed to guide the researcher in collecting data and to test the variables identified and not to prove these variables statistically.

- The author sees workflow adoption phenomenon as a subjective reality that is socially constructed and through in-depth interpretive methods fosters rich insights into the workflow adoption phenomenon in the policy making domain.

4.2 Research Approach

There are two important approaches, inductive and deductive for conducting a study that involves theory as a building or development process. Research that adopts existing theory to develop hypotheses and test them will have a deductive approach and research that collects data and afterwards analyses it and constructs a theory uses the inductive approach. The deductive approach tends to explain correlations between variables and adopts quantitative methods to statistically test and verify the results (Saunders *et al.*, 2003). Gill and Johnson (1997) suggests such an approach calls for a highly structured methodology that facilitates replication in research. The inductive approach contributes much to the theory building process. The choice between the deductive and inductive approaches depends on the research design in hand. IS is a multidisciplinary science which involves complexities of context and technology in relationships. The inductive approach helps in understanding the phenomenon with relation to its context in depth. Therefore, to understand workflow adoption in the policy making context this study adopts inductive approach to build theory and collect detailed understanding of the phenomenon in hand. It also enables the analysis of the policy maker’s perspective on workflow adoption and to collect qualitative data.

4.3 Research Strategy

Research strategy is the plan for conducting the research and selecting between different research methods for collecting and analysing the data (Galliers, 1992). It plays an important role in carrying out the research where it is important to select the appropriate strategy that will help in collecting the correct data to understand the phenomenon. There are different research strategies for collecting the data with particular characteristics such as case study, survey, experiment, grounded theory, field study, action research, exploratory, descriptive, explanatory studies, longitudinal studies, and ethnography (Saunders *et al*., 2000; Cavaye, 1996). According to Yin (1994) there are three conditions that describe which strategy is appropriate for the particular research. It consists of the type of research question under the lens; the type of control the investigator has over the behavioural events and the extent of the focus on contemporary events as opposed to historical ones. For the purposes of this study and in accordance to Yin (1994), this research adopts the qualitative case study approach. The research questions in this study necessitate adopting a qualitative method for data collection as the inquiry relates to *how* and *what* questions. The adoption of workflow technology can be best studied in its proposed context where decision makers, organisation and technology play influential roles in its adoption. To understand the phenomenon within its complex context, the case study method allows the investigator to collect in-depth data.

4.3.1 Qualitative research

To acquire knowledge about a phenomenon is to examine it in its natural setting because various variables such as culture, people, time frame and environmental forces are making a constant impact on the phenomenon under consideration. It also implies that same phenomena can have different results in different settings, which necessitate a method that can interpret non-numerical data. According to Van (1983) the qualitative method of research tends to translate and describe and to interpret the meanings attached to the phenomenon rather than defining the frequency of its occurrence. Quantitative research focuses on predictions (Hakim, 2000), which require statistical verification whereas qualitative research describes the phenomenon in its real setting. This allows the researcher to understand the phenomenon in depth and derive conclusions based on rich empirical data from the phenomenon's setting. Denzin and Lincoln (1994) also suggest that a qualitative method is a naturalistic approach that involves interpreting meanings attached to subject matter by the people involved.

Despite the benefits entailed with adopting qualitative research there are some limitations that must be acknowledged by the researcher. For example according to Miles and Huberman (1994), qualitative research is predominantly textual which at the time of summarization can lose its richness. It is also unstructured as the individual's perception and actions are recoded and interpreted and these processes tend to be influenced by the researchers own understanding. This can lead to a biased interpretation of the data, which has also been supported by Cornford and Smithson (2006). Generalisation of the results has also been one of the limitations of the qualitative research method. With these limitations in mind and the epistemological stance taken in this research, qualitative research is still the most suitable approach for this study. Table 4.2, highlights the characteristics of qualitative research with reference to implications to this study.

Characteristics of Qualitative research	**Research implications**	**Authors**
Enables the researcher to analyse complex issues and processes in depth.	Concept of integrating workflow technology in policy making process to facilitate public policy development.	Benbasat *et al*. (1987); Creswell (2008); Maykut and Morehouse (1994); Silverman (2010); Bryman and Bell (2007) and Kuechler *et al*. (2009)
Building new theory and studying contemporary phenomena	Chapter 1 and 2 advocates lack of research in workflow adoption in the policy making domain	Morse, (1999); Saunders *et al*., (2000); Creswell (2008)
Allows understanding a phenomenon in its natural setting and building theory from field.	Understanding how policy makers can be motivated to adopt workflow technology and what factors facilitate the adoption process in public policy authorities.	Benbasat *et al*. (1987); Maykut and Morehouse (1994); Silverman (2010); Kuechler *et al*. (2009)

Table 4.2: Characteristics of Qualitative research

This research involves an understanding of the meanings attached to the phenomenon by the people, who are the decision makers, who influence workflow adoption within a set environment. Therefore, interviewing policy makers and managers in their natural setting is important to collect a rich and holistic account of the phenomenon. The qualitative method helps in collecting and analysing the data most appropriately as compared to quantitative methods. It is also an approach to collecting data in the most realistic and natural environment by allowing the researcher to adopt a multi-method research technique to interpret events occurring in terms of the meanings attached. It also allows capturing the nature and complexity of the phenomenon, which in this study is workflow adoption in the policy making domain. As the research stresses the context in which the workflow adoption is taking place (public policy) and the perception of the policy makers on its adoption, it is important to understand the complex process, qualitative method is the most appropriate approach. Bryman and Bell (2007) suggests the qualitative method as a preferred research method to understand the complex context and process of the phenomenon under investigation. The workflow adoption framework in section 3.3 is an interpretive tool that allows understanding of the phenomenon and maps important contextual and functional factors. The ontological assumption in this study sees social entities and realities as an outcome of on-going social interaction. For this reason adopting a qualitative method benefits the research in data collection from the natural setting of the phenomenon and interprets the meanings attached by the decision makers. By conducting triangulation of data it evades bias in the interpretation of the data. Lastly, a qualitative research approach also enables the researcher to match the study's theoretical underpinnings to the epistemological stance in this study.

4.3.2 Case study

After selecting a qualitative method as an appropriate research tool for this study, in section 4.3.1, it further adopts the case study method for data collection. Case studies allow exploration of the phenomenon in depth with context and with people's perceptions in consideration. According to Yin (2009), a case study allows the researcher to explore a contemporary phenomenon in detail, within its real life context and especially when the boundaries of the phenomenon and the context are not so clear. It enables the inquirer to interpret the opinions, behaviour and actions of the individuals who are influencing the existence of the phenomenon under investigation. This understanding has also been supported by Bryman and Bell (2007) who suggest case studies are adopted not only for qualitative but also quantitative reasons, however, in order to generate more rigorous and in-depth information, a qualitative case study is more appropriate. Furthermore, Cavaye (1996) highlights the diversity of using the case study method by describing it as appropriate for structured, deductive and positivist research in multiple case studies and for unstructured, inductive and interpretive research in one case study. This signifies the importance and strength of adopting the case study method for collecting data in multiple ways and generating different results. Researchers also advocate that the case study has the ability to analyse complex issues, provide richer information and enable sufficient exploration of the phenomenon from different perspectives (Orum, *et al*., 1991; stake, 1995; Green and Thorogood, 2008). Another reason for selecting a case study for data collection is via the research question. Research that focuses on answering questions that need exploration of the phenomenon by using ‘why’ questions and finding reasons behind the existence of the phenomenon, predominantly adopt case study method. Yin (2007) determines that the application of the case study method is based on the research questions under the lens. There are different approaches for collecting the data in the case study method such as interviews, observations and documentation which generate much more in-depth and rich information, also taking contextual factors into account, compared to the quantitative methods of surveys and experiments (Yin, 2009; Green and Thorogood, 2008; Walsham, 1995b).

Case study characteristics	**Reference**
Focus on contemporary events	Benbasat *et al*. (1987); Yin (2003)
Rich, in depth, multi perspective exploration	Orum, *et al*. (1991); stake (1995); Green and Thorogood (2008)
Evaluating one of more entities	Benbasat *et al*. (1987); Cornford *et al*. (2005)
Lack of control on behavioural events	Yin (2003)
Research questions posed with ‘Why’ and ‘how’ inquiries.	Benbasat *et al*. (1987); Yin (2003)
Triangulation of data collection methods	Yin (2003)

Table 4.3: Characteristics of case study

There are many research studies that have adopted the case study method in IS and developed theories (Yin, 1994; Klein and Myers, 1999; Galliers, 1992; Orlikowski and Baroudi, 1991). As stated in chapter 1, the research question seeks to answer how the decisions are made to adopt WfT in the policy making context. It is important to answer the research questions ‘how’ in order to explore perceptions of decision makers on workflow adoption and ‘what’ to investigate the contextual and functional factors that influence the adoption of workflow. In order to do so, an exploratory case study method is best suited that will generate in-depth information, for collecting rich insight into the phenomenon, based on the interviews, observations and documents. Different entities are evaluated as the WfT phenomenon is contemporary in nature and has not matured in the policy making domain. Therefore, this study seeks to evaluate the data from the different perspectives of the participants belonging to IT, services and policy making departments. Such a multiple method of data collection will allow triangulating the data for more accurate interpretation and findings.

This study requires a workflow adoption framework to be applied in the real life policy making domain that will guide the researcher in collecting appropriate information from its contextual factors and workflow functional factors. Hence, local government authorities were chosen to be the case studies for this research. As the research proposes a recommendation tool for public policy making, local borough councils are the best matches. Another reason is that local government authorities are seeking performance efficiencies through IT adoption, which has led to huge investments in IT equipment and infrastructures (Brown, 2001). It allows studying the phenomenon of workflow technology adoption in an environment where workflows are implemented and the potential use of it is a growing interest to the policy makers.

4.3.2.1 Case study type

According to Yin (2003) there are different types of case studies such as exploratory, descriptive and explanatory. The choice of selecting the type of case study depends on the type of research question ‘what’, ‘why’ or ‘how. Saunders *et al*., (2000) explains the classification of case studies by describing an exploratory study as investigating what is happening, coming up with new concepts, assessing phenomena and posing questions. It is flexible and adaptable and drives the research from a broad to a narrow spectrum. Exploratory research is conducted by investigating the literature, expert opinion and focus group interviews. A descriptive case study is focused on a clear understanding of the phenomenon before data can be collected and it tends to depict the exact profile of the person, event or situation. Explanatory case studies tend to study a problem or situation in order to explain relationships between the variables. It is employed in a quantitative research study to make statistical tests in order to explain correlations between the variables. Based on the classification of case studies, this thesis employs an exploratory case study to collect data. As this type of case study allows investigation into new insights and building theory, and tends to answer research questions based on ‘how’ and ‘what’, it is selected as an appropriate case study type. The researcher seeks to investigate factors that may influence workflow adoption in the policy making context and find out how policy makers can be motivated to adopt workflow technology for policy making.

4.3.2.2 Single or multiple case studies

After selecting the case study as a research strategy and the exploratory case as the type of study, it is important to decide whether to adopt a single or multiple case studies to understand the phenomenon. Case studies can be conducted as single or multiple depending on the research issue and question. However, it is important to finalise this decision before data is collected. Different authors have argued on the appropriate number of case studies for qualitative research. Eisenhardt (1989) suggests case studies should not be less than four and more than ten. Gable (1994) suggested it should not be more than five. A single case study is conducted when the phenomenon under investigation is of special interest, such as testing an established theory (Rowley, 2002). According to Yin (2003), there are five conditions under which a single case study can be applied to qualitative research.

1. When it is to test a critical case relating to a well-established theory.

2. When the case is represented with uniqueness in the research issue.

3. When the single case is the representative or typical case.

4. When a phenomenon has previously been inaccessible to research.

5. When investigation of a phenomenon is by longitudinal case.

Furthermore, researchers argue that a single case study is best applied at the outset to theory generation, late in theory testing and exploration purposes are followed by multiple case studies (Bonoma, 1985; Benbasat *et al*., 1987). Considering the attributes of the single case study in the light of this research, it does not meet the fundamental requirements embedded in this study. Therefore, adopting multiple case studies to collect empirical data is the preferred choice. Multiple case studies will allow the researcher to cross-check results among different organisations and this means replication of data and it dismisses the typical case study scenario of a single case. It will allow the evaluation of the conceptual framework by analysing literal replication (similar factors of workflow adoption in multiple cases) and theoretical replication (dissimilar factors of workflow adoption in multiple cases) among different public policy making authorities. The conceptual framework is based on two well-tested theories (TOE and TTF) to explore for factors that influence decisions to adopt WfT and, as a result, it extends and evaluates the theories in a new domain.

Robust and compelling results are generated using the multiple case study method, however consideration must be given to access to the organisation and time frame are crucial factors to be aware of (Herriot and Firestone, 1983; Yin, 2003). The study aims to investigate what factors influence the decision to adopt WfT that implies its pre adoption analysis and does not require evaluating the phenomenon under a longitudinal study. Hence, this research adopted three local borough councils for workflow adoption investigation. The number of councils has been limited to three only due to limited access to data for strategic level reasons, timescale for the research and allowing future work to be carried out in county councils that have a more dynamic environment than local borough councils.

4.4 Investigational Research Methodology

According to Jankowicz (2005) there are three stages to be considered in qualitative research, which are research design, data collection and data analysis. Many researchers have argued that these stages should be identified before carrying out the case study (Yin, 2003; Saunders *et al.*, 2007; Bryman *et al.*, 2007). Hence, based on the three stages research methodology, this study develops an empirical research design, which guides it through the research process to evaluate the proposed workflow adoption framework in the policy making domain. Figure 4.1, shows the three stages in accordance to the research question defined in this study.

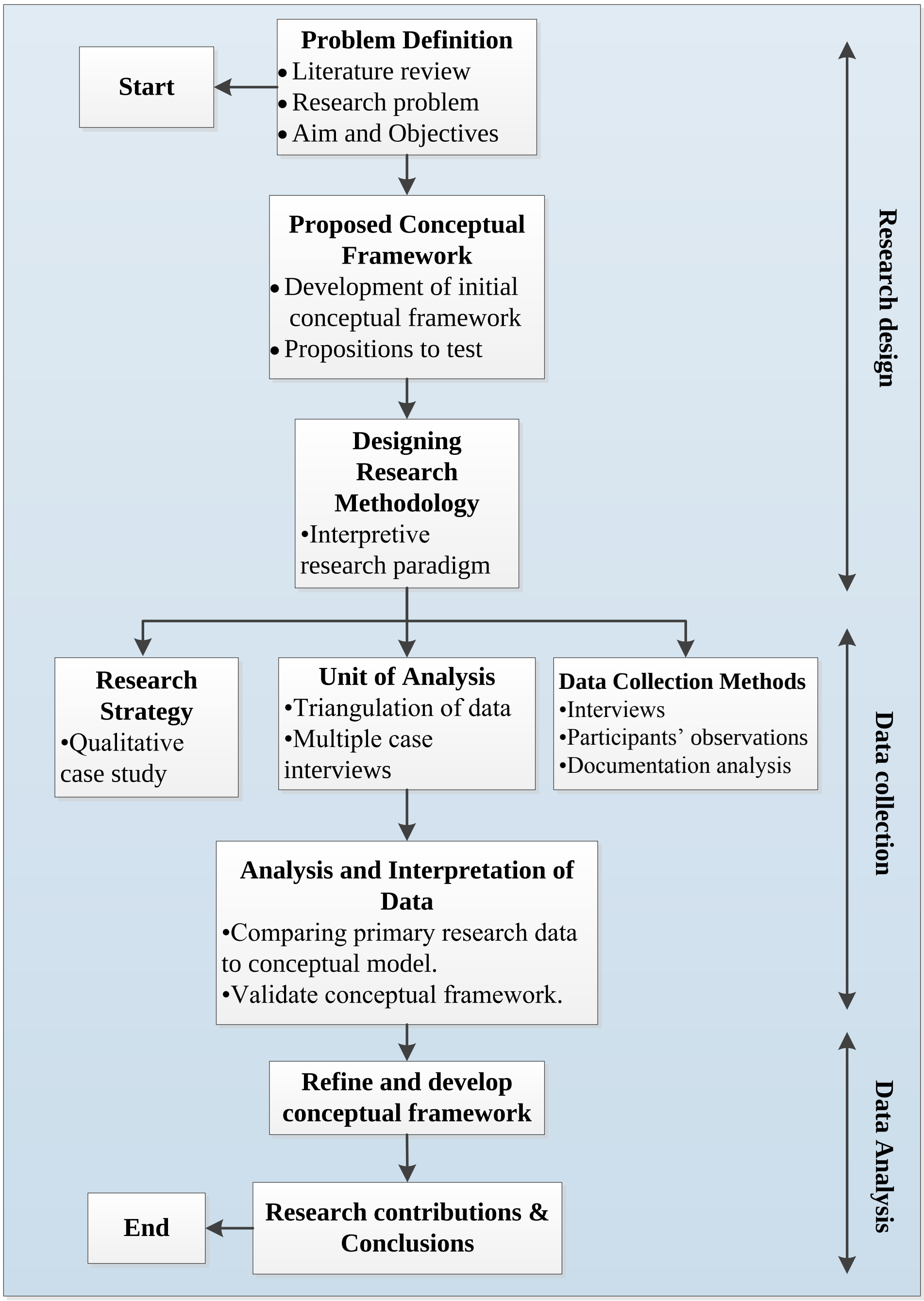

Figure 4.1: The research methodology process

4.4.1 Research design

Research design is the stage of the research process that connects the data collection to the conclusions (Rowley, 2002). It keeps the research question aligned with the conclusions and acts as an action plan that will guide and focus the research process. Yin (2003) explains research design as a logical sequence, collecting data, analysing and interpreting observations that will connect empirical data to research questions and finally the conclusions. Figure 4.1 illustrates the sequence of the research design presented in this study.

The researcher began by creating an understanding of the research problem through examining the relevant literature in chapter 2. This led to the identification of important issues relating to workflow adoption in the policy making domain and the research questions are defined and mentioned in chapter 1. Next, the theoretical framework is developed in chapter 3, which is the basis for the empirical method and defines the focal theory of this study. However, the significant phase of the research design is the data theory, which is based on the research methodology. There are three primary stages of the research methodology: research strategy, research methods and unit of analysis that have been presented in this chapter. This study selects qualitative research strategy to employ multiple case studies in order to explore the phenomenon of workflow adoption and for theory building.

Next, the research design is translated into case study protocol. The protocol is the action plan to collect the data that is required by the qualitative method for the unit of analysis. Data is collected through interviews, observations and documentations adhering to case study protocol. The data is analysed and case study report is presented further in the research.

4.4.2 Data collection

The second part of the research methodology is the data collection method. Once the case study strategy has been selected now it is to decide how the evidence will be accumulated. According to Yin (2003), the case study strategy allows multi method data collection such as:

1. Documentation
2. Interviews
3. Direct observation

4. Archival records

5. Physical artefacts

This triangulation approach to collecting data allows the researcher to combine different methods of data collection that provide rich and in-depth information, enabling the generation of stronger and better authenticated theory. Different researchers have acknowledged in their studies the use of the multi method case study strategy to generate reliable and valid research findings (Yin, 2003; Bryman *et al*., 2007; Irani *et al*., 2008).

Table 4.4, provides a list of sources of evidence with comparative strengths and weaknesses provided by Yin (2003) and an example of the sources utilization in this study. The researcher uses the most accessible source of evidence to conduct data collection and does not solely depend on the strength or weaknesses of each individual source.

Sources of evidence	**Strengths (Yin, 2003)**	**Weakness (Yin, 2003)**	**Selected sources in this study**
Documentation	Stable can be reviewed repeatedly Unobtrusive – not created as a result of the case study. Exact–contains exact names, references and details of the events. Broad coverage–long span of time, many events and settings.	Retrievability - can be low biased selectivity, if collection is incomplete. Reporting bias- reflects (unknown) bias of author. Access - many be deliberately blocked.	• Business cases • Council constitution reports • Business strategy reports • Councillors guides • Annual plans • Manuals • ICT strategy report • Corporate procurement report • Websites
Archival records	[Same as above for documentation] Precise and quantitative	[Same as above for documentation] Accessibility for privacy reasons	
Interviews	Targeted-focuses directly on case study topic. Insightful-provides perceived casual inferences.	Bias due to poorly constructed questions. Response bias. Inaccuracies due to poor recall. Reflexivity-interviewee gives what interviewer wants to hear.	• Semi-structured interview • Unstructured interviews

Direct observation	Reality-covers events in real-time. Contextual-covers context of events.	Time consuming. Selectivity-unless broad coverage. Reflexivity-event may proceed differently because it is being observed. Cost-hours needed by human observers.	Direct observation during the visits to case organisations: • Payroll department • Finance Admissions and Transport
Participant observation	[Same as above for direct observation]. Insights into interpersonal behaviour and motives.	[Same as above for direct observation]. Bias due to investigator's manipulation of events.	Participant's observation through face to face interview meetings.
Physical artefacts	Insights into cultural features. Insights into technical operations.	Selectivity Availability	Electronic files

Table 4.4: Data collection methods: Strengths, weakness and employment in this research (Source: Yin, 2003a)

Interviews and document analysis has been evidently a stronger data collection method in the literature than has been most frequently adopted for interpretive case studies (e.g. Walsham, 1995; Lee, 1991; Maykut and Morehouse, 1994; Silverman, 2010; Voss *et al*., 2002). This study predominantly relies on interviews for interpretive qualitative data collection and uses other accessible secondary sources such as documentation analysis, participants' observations and websites). Nachmias and Nachmias (1996) suggest that 'The interview is a face-to-face interpersonal role situation designed to elicit answers pertinent to the research hypotheses' (Nachmias and Nachmias, 1996, p232). It allows taking into account the actions, events and interpretation of the participants, providing more perspective to data collection (Walsham, 1995b; Hannabuss, 1996). According to Hussey and Hussey (1997) interviews allows the researcher to find out how participants think or feel by eliciting structured or unstructured questions. Furthermore Silverman (2010) explains what constitutes an interview, any verbal confirmation or disconfirmation of observation, any formal or informal or casual answers to the questions posed to the participants. This allows collecting data in the most natural environment and true to the meanings attached by the participant regarding the phenomenon under investigation. Being present in the same environment as the participant gives the opportunity to feel, observe and understand the context more precisely. The main aim of conducting interviews is to pose direct verbal questions to the participants, however, there are different ways of conducting interviews: face to face, voice to voice, screen to screen or individual to focus group (Frey and Fontana, 1991; Maykut and Morehouse, 1994; Hussey and Hussey, 1997). The format of the interview can be pre designed which includes a set of questions to be asked, time allocation to each question and types of questioning, all according to a set priority. Table 4.5 presents the selected participants from the three case studies for the interviews. The strategy behind selecting the participants was to contact the policy makers first to understand how policies are made and through their references to contact IT staff that helped in identifying WfT users in the case organisations and to understand how adoption took place. Next, it was important to interview the users of the WfT in the case organisation so with the support of IT department users where identified and approached with references.

	Category	**Job title**	**Number of participants**
LGA_A	Policy makers	Policy and planning head Policy and planning manager	1 1
	IT	IT head	1
	User	Service manager Service officer	1 1
	Total		5
	Category	**Job title**	**Number of participants**
LGA_B	Policy makers	Policy and planning manager Policy and planning officer	1 1
	IT	IT head IT support manager Project manager	1 1 1
	User	Payroll manager	1
	Total		6
	Category	**Job title**	**Number of participants**
	Policy makers	Policy manager	2
LGA_C	IT	IT manager Project manager	1 1
	User	Admissions and transport manager	1
	Total		5
	Grand total		**16**

Table 4.5: Participants from the case studies

There are three types of interviews namely, structured, unstructured and semi structured interviews (Maykut and Morehouse, 1994; Hussey and Hussey, 1997; Denzin and Lincoln, 1998). The major differentiating factor between the types of interview is the questions and priority in terms of focus and timings. However, Frey and Fontana (1991) suggest that there is no optimal time for carrying out interviews. Structured interviews focus on predetermined, designed and specific questions, which the researcher strictly adheres to.

Unstructured interviews are informal interviews that are directed by the researcher at the time of the interview and no pre-defined specific questions are posed to the participant.

In this study the researcher has adopted semi-structured interview techniques for each case study allowing the participants to naturally express their understanding and opinion on the subject matter. Semi-structured interviews allow the researcher to follow a less tight and standardised format, therefore there is more room for interaction between the interviewer and interviewee and more complex issues and dynamics of the phenomenon can be better understood. Open-ended questions were asked from each case study to elicit data regarding the contextual and workflow functional perspectives that brings out all the important issues that are important to understand the phenomenon. Open ended questions are semi directive but open to all perspectives and opinions of the interviewees that highlight those issues that were not considered by the investigator initially. Interview questions were designed according to the components of the framework and these were as below:

- Contextual level factors for adoption of workflow
    - Technological factors
    - Organisational factors
    - Environmental factors
- Functional level factors for workflow adoption
    - Task characteristics
    - Technology functions

Interviews were conducted based on the structure of the case study protocol (see Appendix A). The case study protocol (section 4.6) guides the interview sessions and keeps it focused on the theme of the research study. It also provides background to each case study, an action plan for data collection and questions and reporting format for the case studies. There are three areas covered for interviews from each case study. These areas build understanding and collection of data more systematically and generate information covering contextual and functional perspectives.

Interview areas:

- General background: general information on each organisation, taking into account the size of the organisation, hierarchy, nature of organisation etc.

- Technical information: (a) to collect information on IT infrastructure and relating issues, (b) to identify workflow adoption solutions, (c) to identify the types of systems integrated, (d) to find technical factors that influence Wf adoption.

- Business information: to identify policy making processes; what are the stages involved and see how Wf technology can be beneficial for public policy formulation.

4.4.3 Data analysis

Data analysis is the third stage of research methodology as shown in figure 4.1. In this section of the research, data collected from the case study reports have been triangulated and analysed. One of the drawbacks of conducting an interpretive case study is the lack of statistical tests (Miles and Huberman, 1994; Cornford *et al.*, 2005; Fisher, 2004), however this study analysed interpretations and actions of the participants by cross case analysis and analysis within each case (Yin, 2009). According to Miles and Huberman (1994, p. 10), analysing qualitative data consists of three concurrent flows of activity: data reduction, data display and conclusion drawing/verification as presented in figure 4.1. This study adopts data analysis strategy presented by Miles and Huberman (1994) to generate appropriate findings and conducts cross case analysis as suggested by Yin (2009).

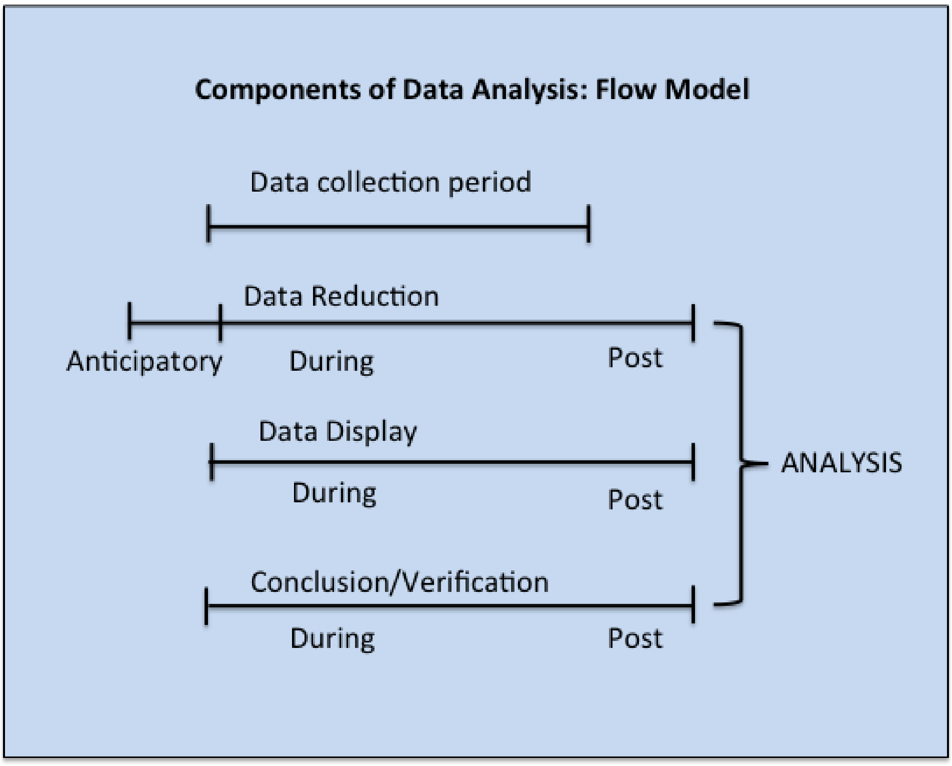

Figure 4.2: Components of Data Analysis: Flow Model (Source: Miles and Huberman, 1994)

4.4.3.1 Data reduction

Data reduction is a continuous process that starts before the data is actually collected and continues until the final output of the research is presented. While compiling the literature review and designing the conceptual framework, data reduction is taking place in the research process. According to Miles and Huberman (1994, p. 10) “data reduction is the process for selecting, focusing, simplifying, abstracting and transforming the data that appears in written up field notes or transcriptions.” Data reduction is generally done by coding, creating themes from the data collection, summarising or pattern matching (Miles and Huberman, 1994). In this study, the researcher has adopted coding scheme based on the conceptual framework components. This helps in organizing and extracting the right information from the large chunk of data into meaningful categories. By applying conceptual framework to reduce the data it also shows compliance to what Yin (2009) has suggested which is to use theory and well-structured research designed for data collection and analysis. Therefore, the study applied a conceptual framework and research questions to derive the themes for the data reduction stage. Handling large amounts of data can be a cumbersome and complex task. If precautions are not taken, some of the valuable data can be lost or misrepresented. Hence, "conceptual frameworks and research questions are the best defence against overload" (Miles and Huberman, 1994, p. 55).

4.4.3.2 Data display

Data display is the second part of the data analysis. It is the summarised and well-organized form of data taken from a large chunk that can generate meaningful conclusions. Display allows the reader to understand what the investigator knows and what is happening and provides to the investigator a clear picture for drawing conclusions. According to Yin (2009) using case study questions to generate categories, which can then produce taxonomies, and withholding themes is the preferred way and has been adopted in this study. Data display can be performed through developing matrices, graphs, charts and networks (Miles and Huberman's, 1994).

In this study, the answers to the case study questions are thematically and conceptually displayed using a matrices approach within and across cases for the contextual and functional level factors. Moreover, an iterative process of data display and analysis carried out to find relations, comparisons and any re-analysis requirements (Miles and Huberman, 1994). It is yet again data reduction because information is analysed and if it is found to be useful and important for display is kept while other information is discarded from the display. This stage is similar to the previous stage of data reduction, however in data display, categorisation strictly adheres to the research questions.

4.4.3.3 Verification

The last stage of the data analysis is drawing conclusions and verification. From the start of the data collection, the researcher is collecting information to extract relations, patterns, explanations, and suitable propositions. "Competent researcher holds these conclusions lightly, maintaining openness and scepticism, and openness but the conclusions are still there, inchoate and vague at first, then increasingly explicit and grounded" (Miles and Huberman, 1994, p.11). In this study, where data analysis is based on the conceptual framework that tends to predict explanation and relation, this thesis adopts the pattern-matching technique to draw conclusions (Saunders *et al*., 2009; Yin, 2009). Pattern matching is based on the rationale of matching theoretical predictions of the study to empirical findings that have been suggested as strengthening the internal validity of the case study by Yin (2009). Other than the pattern matching technique several micro actions were carried out to establish theoretical coherence.

Use of a software package to help organise thorough and transparent analysis of empirical data has been suggested by many researchers (Creswell, 2009, Miles and Huberman, 1994). This study used Nvivo 9 software to increase speed, quality and better representation of data. It allowed organising semi structured interviews, to create codes both deductively and inductively, transparency and revisit to data for better quality analysis. It also enabled to produce graphical representations of the analysis, which are present in chapter 5 of this thesis. Nvivo software helped in concentrating on appropriate chunks of data hence helped in appropriate reduction of data process. However, decision making, interpretations were mainly done by the researcher.

4.4.3.4 Within and cross case analysis

In order to strengthen data analysis this study considers within and cross case analysis. With respect to within case analysis, the research seeks to compare theoretical predictions and frame of reference and for cross case analysis synthesis technique is employed to find out similarities and make a robust understanding through cross case comparisons (Yin, 2009; Miles and Huberman, 1994). In order to do so, level 2 questions have been used for within case analysis as these seek to analyse data within the case with reference to the theoretical findings. Cross case analysis is conducted employing level 3 questions as mentioned in section 4.6 (case study protocol), findings from the answers to level 3 questions lead to comparison with theoretical underpinnings in this research.

4.5 Triangulation of Data

Another important issue to consider while conducting interpretive research is the reliability and validity of the findings. Triangulation is the term used for data validating in the literature (Denzin, 1978). There are four types of data triangulation that have been mentioned by Yin (2003):

- Data
- Investigator

- Theory
- Methodological

Data triangulation means using a variety of data sources in the study (Denzin, 1978). The second type is investigator triangulation that involves more than one investigator and evaluator. The third type is theory triangulation that is to analyse the data from the perspective of different theories. Lastly, methodological triangulation is the one that allows the researcher to use multiple methods for analysing the problem. Janesick (2000) added a fifth type, interdisciplinary triangulation, which is the investigation of issues using more than one discipline. From the given definition of the types of triangulation techniques, this study adopts data, methodological and interdisciplinary triangulations.

Organisation	Type of triangulation	Source
Case studies	Data	Business cases Reports Interviews Observations
	Methodological	Documentation Archival records Interviews Observations
	Interdisciplinary	Information Systems Management Culture

Table 4.6: Types of data triangulation in this study

4.6 Case Study Protocol

A case study protocol is an action plan that helps the investigator to stay focused on the research objectives for collecting the right data in the right manner. Yin (1994) described case study protocol as a tool for operationalizing research and collecting data according to rules and regulations. Many researchers have argued for the importance of developing a case study protocol for better focus and consistency in data gathering (Remenyi, 1991: Irani *et al*., 1999). Hence, the case study protocol is an action plan used by the researcher to schedule the data collection dates, means by which it is collected, steps to be taken and directs the questions to be asked. According to Yin (1994) a case study may have five levels of questions that have been presented in table 4.6. He also suggested an outline for the case study protocol that contains the following:

- The case study overview;
- Fieldwork research procedures;
- Questions addressed by the research and
- The research output format.

Level of Questions	Type of Questions	Section Reference
Level 1	Questions asked of specific interviewees	The interview agenda
Level 2	Questions asked in an individual case study	Section 4.6.1/4.6.2
Level 3	Questions ask across multiple case studies	Section 4.6.3
Level 4	Questions asked about the entire study	Section 1.3
Level 5	Questions about the recommendations and conclusions beyond the scope of the study	Chapter 7

Table 4.7: Levels of case study questions in multiple case investigations (Yin, 2003)

Yin (2003) also describes level 1 and 2 questions to be the most important ones and it is imperative to articulate level 2 questions well for data collection. Level 3 questions are designed if there is multiple case study method for data collection and this takes place once all the data from the single case studies have been analysed.

4.6.1 Overview of the case study

The purpose of this research is to identify the most favourable conditions under which the policy makers' decision to adopt workflow technology will be positively influenced. In this endeavour the author contributes to the limited extant literature on workflow adoption. The aim is to explore the public policy organisation context for the factors that the literature has identified for other IT/IS from the workflow technology perspective. In doing so, the researcher identified some issues that need to be taken into account for retaining focus during the interviews:

- To identify the application of workflow system among the departments within each case study.
- To identify the adoption process of decision making for workflow within each case study.
- To classify technological, organisational and environmental factors considered for workflow adoption.
- To classify workflow functional and task characteristics considered for workflow adoption within each case study.
- To explore factors appropriate for addition in the conceptual framework for workflow adoption.

4.6.2 Action plan for data collection

It is important to have an action plan for data collection before interviews are to be conducted. It helps by saving time and applying substitute methods in case there is a change in events. As mentioned in section 4.3.2, the case study is the research method for collecting data from the real life setting of the phenomenon. It means there is always the possibility of unforeseen changes taking place to the action plan for collecting data such as interviewees dropping out or lack of access to documents and information. However, interviews are scheduled and documents can be requested ahead of time, but interruptions do occur while collecting data from natural settings. Therefore, fieldwork procedures need to be designed to successfully meet unforeseen changes taking place during the data collection process. In this section, those actions have been listed which will be employed to encounter unexpected changes of plan during multiple case study investigations. These are as below:

- To specify who will be interviewed during the case study investigation. For the purpose of this study it is important to interview IT managers, Administrative staff and Policy makers in all cases. First of all it is important to interview IT managers in order to identify an appropriate workflow system deployment within the local councils. IT managers are also considered to be stakeholders who need to be interviewed due to their position in decision making for technology adoption. They will aid in exploring and identifying variables that facilitates workflow adoption. Then administrative staffs that are the actual users of the system are in a better position to help explore the usefulness of the system in equivalence to the task. Lastly, policy makers who can help in collecting in-depth knowledge about the policy making process, the requirements of each task and explore how workflow technology fits in the policy making process.

- The data collection method and line of inquiry: as mentioned in section 4.4.2 interviews were the primary method of data collection in multiple case studies investigation. For the purpose of staying focused and prioritizing questions during the interviews, a case study interview agenda was developed and used for controlling the direction and duration of interviews. These interviews were recorded and then transcribed later for analysis. Other sources for data collection as mentioned in table 4.4 were also considered such as websites of the councils and documents.

- As the data collection environment is set in the natural settings changes to planned interviews can happen. Examples are participants dropping out from interviews, participants arriving late to interviews and other unpredictable events. Hence, a timetable was developed to organize the data collection from each organisation. It contains date, time, location and role of the interviewees in each case study, in case the assigned participant cannot attend the interview session, perhaps someone else who is willing to participate who has a similar role can be interviewed. The timetable also helps the researcher in keeping a record of how many people were interviewed and how many interviews were cancelled. Apart from that, it allows reviewing the data collection and helps in deciding if any further data is required that can be fit into the timetable. With respect to the time allotment for each interview from multiple case studies, it was decided to allow 1 hour for most of the interviews.

- Ethical issues consideration is important and terms must be agreed before instigating interviews. Such as interviewees’ consent must be taken before any of the information provided by them can be published. Hence, before each interview, participants were informed about recording the interview for research purposes and all the information provided by them will be used for the purpose of this thesis.

Conducting productive interviews require some set of skills. Putting interviewees in the comfort zone, to allow maximum information flow and to steer back the focus of the participant to the interview agenda, who drifts away from the empirical inquiry. It is important to give the interviewee confidence in the interviewer to obtain controversial and confidential information. For this it is important to present a confidentiality agreement, which states that all the information provided by the interviewee will be strictly used for the purpose of the research without exposing the identity of the provider. It is also important to mention tape recording of the interviews, as any objections laid by the participant can be discussed prior to the start of each interview. To break the ice between the interviewee and investigator, each participant was asked to describe their role within the organisation. It allows the participant to be comfortable before the actual interview questions are asked and gives an opportunity for the investigator to understand how to put forward questions that participants can best answer. After this, an interview agenda was used to guide the structure of the interviews and to keep time as productive as possible.

4.6.3 Question in the case study

In order to keep focus on the right path for data collection, a set of four levels of question were developed. These questions are solely for the purpose of guiding the researcher and giving structure to the interview sessions and not to be presented to the interviewees. Essentially, the main purpose of the protocol questions is to help the interviewer in collecting data regarding workflow adoption in the policy making domain by presenting four levels of questions in each case study. These have been summarised in table 4.7 below.

Question no.	Questions
1	What are the factors applied by case organisation that influence decision- making regarding workflow adoption?
2	What are the organisational, technological, environmental and functional factors associated with WfT adoption?
3	What are the benefits, requirements and barriers associated WfT adoption?
4	What are the evaluation criteria used by case organisation for evaluating integration technologies and workflow solutions?

Table 4.8: Questions addressed by the empirical inquiry

4.6.4 Output format of the research

During the data collection process a huge amount of data is gathered especially when the case study type is multiple. To organize and present it in an optimal manner where the audience can extract useful and correct information is vital and requires an output format for the empirical data. In order to avoid complexities arising in organizing this huge amount of data, the researcher collected empirical data aligned with the research questions. Hence, the interview questions were linked to the research questions by having a productive format for collecting data. The case study structure that is present in the next chapter 5 is as below:

- Background and overview of the case organisation
- Application of workflow technology in case organisation
- Motivation for workflow adoption
- Contextual and functional level factors for workflow adoption

4.7 Conclusions

In this chapter the philosophical stance of the research has been explained in much detail and justifications have been provided. Keeping up with the ontological and epistemological positions held in this research, the author selects a qualitative case study approach as the preferred research strategy. Considering the complex and contemporary nature of the phenomenon under investigation, this study justifies applying the interpretive approach to investigate workflow through the meanings attached by the social entities. The following points summarises conclusions are derived from this chapter:

- Developing appropriate and concrete research design is important before the data collection stage can be initiated. The consistency between the ontological stance, epistemology and methodology is required and must best serve the research problem. Hence, this study clarifies the research problem first, which is the prevalence of insufficient support for policy makers in regards to decision making for workflow adoption. This requires understanding of the contextual and functional perspectives that has influence on workflow adoption. In order to investigate the research problem the interpretive stance is adopted to collect the meanings attached to the phenomenon by the social actors and, therefore, it requires studying the problem in its natural setting.

- The most important step before empirical data is collected is to prepare a case study protocol. In order to keep focus while conducting the interviews and not drift away from the aim of data collection prioritizing question, time duration and selecting participants can give structure to the interviews and data can be organized without losing the essence of conducting the interviews. Hence, section 4.6 presents the action plan for data collection for this study. It also gives the researcher a clear picture of the prospective interviews and allows preparing beforehand for any contingencies arising during interview sessions.

- Lastly, it is imperative to keep ethical issues in mind while carrying out empirical research. Hence the investigator must obtain approval from the participants for publishing the information, which they might regard as confidential to avoid ethical issues arising in later stages.

The following chapter applies the research methodology explained and justified in the current chapter. Therefore, the findings from the case studies are presented, organized and data is analysed according to the discussions in section 4.4.3.

CHAPTER 5:MULTIPLE CASE STUDIES: ANALYSIS AND FINDINGS

5.0 Introduction

In the preceding chapters the need to explore for contextual and functional factors influencing decisions to adopt workflow technology has been established. To fulfil the requirements, a conceptual model has been proposed in chapter 3 with technological, organisational, environmental and task technology fit factors to be explored in the case studies. Chapter 4 recognises the case study as an appropriate methodology to evaluate the model in real world scenario and explore for influential factors. Empirical data is collected from the three LGAs and the analysis is presented in this chapter. As mentioned in chapter 4, analysis of the data includes scrutinising interviews, documents and observations that are collected from the three organisations. Investigation of the workflow adoption phenomenon in public organisations enables understanding of the phenomenon in its social setting to interpret the meanings attached by the social entities to the phenomenon. The objective of the analysis is to study the phenomenon within each case study and to present findings in this chapter, which will support the revision of the proposed model in chapter 3.

5.1 Background to Local Government Authorities In The UK

Local Government Authorities (LGAs) have originated in medieval times and evolved during the industrial revolution that caused a huge increase in population and change in distribution of the population (LGA, 2011). In the nineteenth century, these LGAs started to evolve organisationally and functionally to enhance urban life and provide services for the urban population (Mellor, 1976). The Municipal Corporation Act was passed in 1835, which defined the structure of the LGAs and extended autonomy to each council for general administration of their areas (Johnson and King, 2005). By the end of the 20th century, power was delegated to the Scottish Parliament to exercise power over local government in Scotland, Northern Ireland Assembly for LGAs in Ireland, Welsh Assembly for LGAs in Wales and the UK parliament to exercise power over LGAs in

England. Nonetheless, being a significant part of the Central Government the LGAs have independent administrative authority over their principal towns and counties.

5.2 LGA Structure

The LGAs (councils) are made up of elected councillors for the period of four years and they represent their specific geographic area also known as wards. They are required to balance the needs and interests of the residents and other partners with council policies and vision. Councillors are involved in decision-making, representing their wards, engaging the residents in policy making process, planning budgets and setting the overall policy framework (RBWM Constitution, 2011). They also decide with a consensus to elect a Leader or Mayor of the council. It is one of the responsibilities of the leader to select among the councillors the members of cabinet and set directions for the council. Each member of the cabinet is responsible for the council services such as social care, housing, education etc. The councillors sometimes have the final policy making decision power and some require the cabinet's endorsements, which also depends on the constitution, taken up by the LGA. The constitution sets out rules and regulations on how the council will operate, how decisions will be made and services will be operationalized. All the policies must comply with the constitution of the council. According to the Local Government Act 2000, all the local councils must have an Overview and Scrutiny Committee. These are made up of non-cabinet councillors and people from outside the council such as businessmen, public members and other organisations (Councillor's guide, 2012). Their job is to scrutinize the decisions made by the cabinet members and hold them accountable. These decisions must be balanced in serving the residents' needs and the council's overall policies and budget while adhering to the constitution. Along with the political structure of the LGAs there is also an administrative side that carries out the daily tasks of running the council and advising the councillors on policy development and implementation. These are called council officers who are led by the departmental directorate and on top is the Chief Executive.

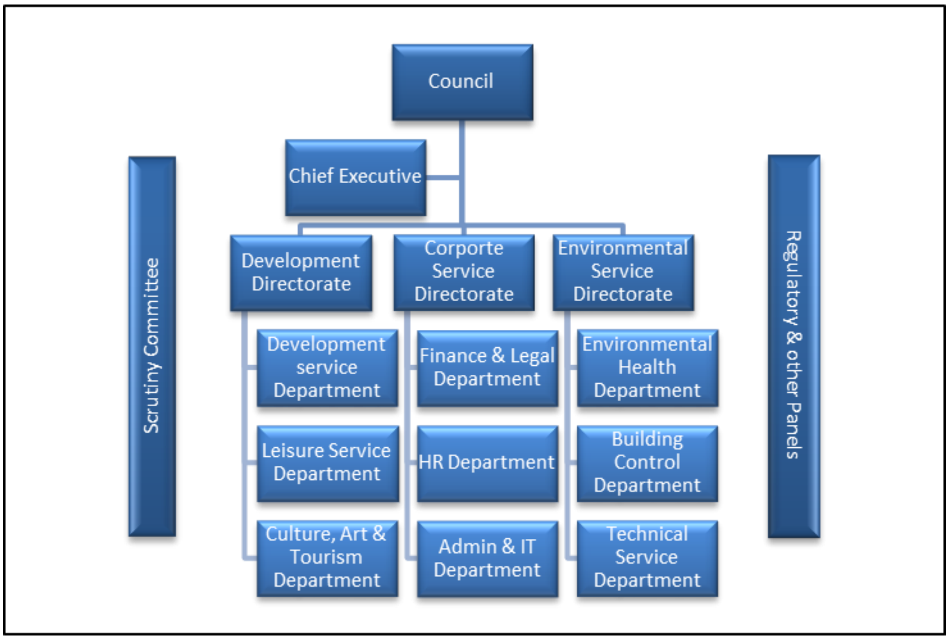

Figure 5.1: Council structure

Figure 5.1 illustrates the organisational structure of a local council and highlights departments operated individually under the authority of directorates. Council officers, executive members of the cabinet and councillors work along with partners to create policies that will benefit the residents of the council and will be in line with the budget and policy framework. The budget is always an issue for the LGAs and their income comes from Council Tax, Business rates and Government Grants. Wisely allocating budget to the different sectors is the responsibility of the full council, keeping in line with the central government mandates and constitutions. According to the CIPFA statistics (2011), the LGA net expenditure (excluding capital expenditure) was budgeted 122 billion pounds, with 38% budget allocation to education sector and 21% to social care. Table 5.1, illustrates the allocation of budget 2010-2011 to different sectors.

Sector	Total in £ bn
Education	46
Social care	21
Housing	19
Police, fire, rescue	14
Culture, environment and planning	11
Highways and transport	7
All other services	4

Table 5.1: Budget allocation according to the sector (CIPFA statistics, 2011)

5.3 ICT Adoption in Local Government Authorities

LGAs are becoming more technology dependant to reduce cost, increase efficiency and have closer engagement with the residents (Councillor's Guide, 2012, Corporate Strategy Report, 2011). They have been slow in transforming from paper-based organisations into fully modern and technology savvy public institutions, however, in order to be more closely engaged with the citizens and to modernise, it is benefiting from a new era of ICT. Evidence can be seen in the adoption of e-government by LGAs. For the fiscal year 2003/2004, the total spend on e-government in the UK was £12.2 billion out of which £2.9 billion was spent by LGAs. This rise in ICT investment shows LGAs are following in the footsteps of private industry to better meet their organisational needs and service utilizers. Some of the IT solutions adopted by LGAs are Social Care solutions, Education and Transport solutions, Customer Services solution, CRM, User Interfaces improvements, Infrastructure updates etc. (Capita, 2012).

ICT not only increases efficiency, such as optimal results with lesser resources and time consumed, but also enables productive and efficient collaborative work between the services, council and with partner organisations. Providing means for sharing knowledge, information and services is a new strategy to reduce cost and increase savings. This trend is predictable in the new business strategy of LGAs of appointing ICT shared services head, for trio-boroughs in city of London, for a single point of uniform service delivery (Andalo, 2013). Initiatives for IT adoption comes from two sources, one from the service department itself realising a need for IT and second from the suppliers suggesting a better solution to current problems with increased efficiency. In both cases, decisions are based on a meaningful business case, which evaluates the proposed technology for the business purpose. The report (business case) incorporates views and understanding from the concerned service department, IT department and finance, cost benefit analysis and the procurement standards. Depending on the budget of the technology it can be authorised by the head of the service department and IT without involving the senior management. However, if the budget is huge, a senior management is involved and the cabinet is approached for endorsement.

Workflow based technologies have been adopted to facilitate communication, collaboration and process structure efficiencies for services departments and corporate services in LGAs. However, adoption of workflow technology, particularly policy making, is lagging behind leading to a gap in the market place. The focus of the LGAs is on sharing, collaboration and utilization of IT and yet workflow technology has not been adopted for policy making. Thus, a deeper understanding of organizational, human and process oriented factors impacting decision-making is required.

5.4 Case Studies Analysis

This study adopts a 'within-case study' analysis approach by providing a descriptive analysis of the findings from individual cases (Yin, 2009; Miles and Huberman, 1994; Eisenhardt, 1989). This allows the author to analyse each case study in depth and provide a detailed write up on the findings by focusing on one case at a time. Moreover, Miles and Huberman (1994) also suggested that such an approach allows the investigator to provide a detailed background to each case study that will help in understanding the contextual elements for a better analysis.

The analysis carried out for each case adopted qualitative content analysis techniques and was based on Miles and Huberman (1994) strategy of data reduction, data display and conclusions. Hence for each case study, empirical data was first analysed using the codes generated from the conceptual framework and open coding method. This led the researcher to reduce the large data into meaningful categories and to draw valid conclusions. Important quotes from the interviews were selected and used where appropriate in the analysis process.

As mentioned in chapter 4, identity of each case organization and the participants have been kept confidential to maintain the anonymity. Analysis is presented by identifying organizations with pseudonyms names and participants by designations. Table 5.2, outlines the structure for analysing each case study.

1.	Background to the organization
2.	Application of workflow technology in case organisation
4.	Contextual and functional level factors for workflow adoption
5.	Summarising the findings

Table 5.2: Case study analysis format

5.4.1 Background to LGA_A

LGA_A is a borough council in the south east of England that serves a population of 144,560 according to the 2011 census. It receives approximately 1000-1500 queries via a call centre and 150- 250 queries face to face at the Council. These statistics are maintained by the team responsible for publishing integrated monitoring reports on the website and is measured with the help of the call centre team. There are about 1600 employees in the LGA_A excluding the teachers that are paid by the Council but are not considered employees of the Council. The services it provides to its area of population ranges from social and environmental services, property, housing, education and health etc. It converted to a unitary authority in 1998 from a non-metropolitan Council and is represented in the UK parliament by members of the Conservative Party. It is well positioned among other councils in terms of ICT utilization and providing wider services through e-government. The traditional and bureaucratic means of service provision to the residents that demanded face-to-face, telephone and by post interaction meant less convenience for the residents and more time spent and these have been replaced by online services with the help of ICT.

Five employees of varying hierarchal levels and from the three categories as described in chapter 4 were interviewed as shown in table 5.3. Apart from that, various documents were collected and some information was collected from the documents that could not be taken away and hence were only allowed to be seen in the organization. Also, the LGA_A website was also used for additional evidence and information. The multiple method of data collection allowed collecting richer data and drawing a better picture of the phenomena under investigation.

	Category	**Job title**	**Number of participants**
LGA_A	Policy makers	Policy and planning head	1
		Policy and planning manager	1
	IT	IT head	1
	User	Service manager	1
		Service officer	1
	Total		5

Table 5.3: LGA_A participants

5.4.2 Application of workflow technology in LGA_A

In order to deliver high quality services to residents, improve internal efficiency and transparency the council has made huge investments in ICT. Among the new changes adopting solutions with detailed workflow technology allows the Council to improve service delivery time, performance efficiency and reduction on cost. In LGA_A Council among the software adopted to serve different departments are EDMS, PARIS SYSTEMS, AGGRESSO, SharePoint and Education Module etc. One of the reasons for extensive utilization of workflow technology can be attributed to high demand from the Central Government on collaboration, improving information sharing, integrated service delivery and better coordination of business processes (Kamal and Themistocleous, 2007; Beynon-Davies, 2005; Lam, 2005), has increased utilization of workflow technology.

During the interview with the head of IT stated that:

“We are looking into workflow technology to allow service departments to collaborate within the council and among the councils and with other partners. We can see how it is benefiting the departments which are using at the moment and hope to integrate more into other departments where we want performance efficiencies.”

Agresso advantage with integrated workflows is the technology adopted by the finance department to enable effective financial management, planning, reporting and support. The system allows capturing, monitoring and manipulating vast information for financial needs. Agresso was adopted to reduce workload, increase efficiency, save cost and to rely on accurate and up-to-date financial information. With the large amount of information circulating in LGA_A it necessitated the adoption of Agresso for efficient information processing.

However, policy making is one department where technology has not prevailed as in other service departments. There is some ICTs involved in storing and organizing data but mostly tasks are paper based and decisions are boardroom based. Some level of ICT is involved in public consultations such as through council websites, online surveys and forums. But there exists no systems that will enable tracking of policies, allow collaborative work on building policies and directly involve citizens in policy making. A policy planning manager stated that there is a lack of technology that will allow them to work more closely and collaboratively on policy and he has initiated some new ways of working collaboratively by adopting Dropbox. However it failed to be beneficial due to its limitation in advanced work collaboration and for security reasons. SharePoint is one technology that they are looking into for working on documents and reports in a collaborative manner. The head of policy and planning expressed his desire for a system that will allow tracking of policies and technological sophistication in policy making and less paperwork moving around.

"… there is no system in the council at the moment for tracking policy which is something I'd like to see in the future. So at the moment, as I'm head of policy, I don't have in this council a clear idea about how many policies we've got or when I did one and what are the new ones. We will have to do a manual check and it's not ideal".

It appears from the interviews that similar perception exists between the interviews that workflow technology facilitates processes with higher performance, time saving, cost reduction and that the policy making department is one that is significantly left behind when it comes to utilizing workflow technology for collaboration tasks, tracking policies and improving processes.

5.4.3 Contextual and functional level factors for workflow adoption

An analysis of the interviews conducted in LGA_A and some documents collected from the organization, for triangulation of data, revealed some important contextual and functional level factors effecting the decision to adopt workflow technology. Following are the findings from Technology, Organization, Environment and Task technology fit perspectives.

5.4.3.1 Technological Factors

Technological factors have influence on the decisions to adopt IT and during the interviews it was revealed that some of these factors have impact on the adoption of workflow technology as well. Following are some of the factors from the technological perspective which were taken from the literature (section 3.2.1.1) and that have been confirmed via interviews and some emerged during the collection of data that are shown in figure 5.2.

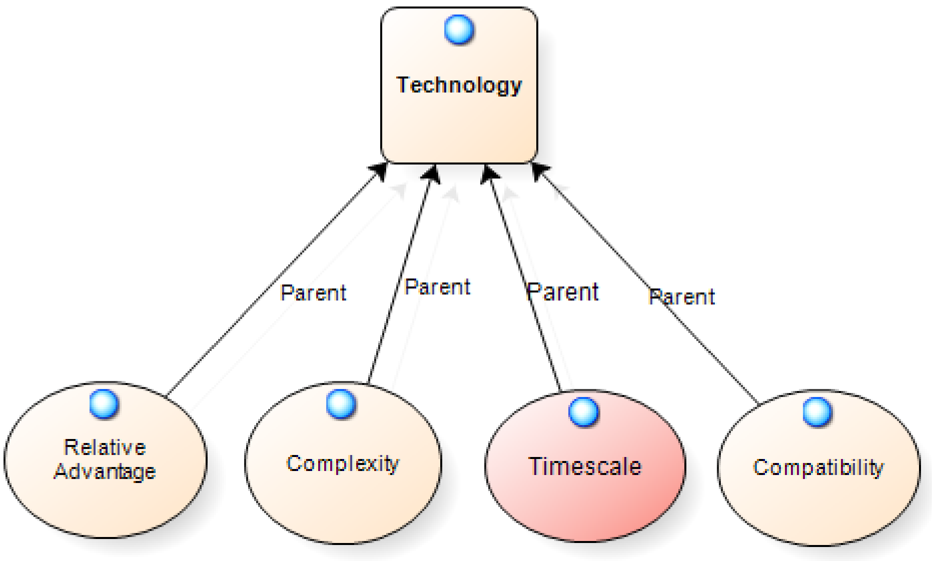

Figure 5.2: Technology factors LGA_A

i. Relative advantage

The analysis revealed that relative advantage was influenced by two elements, process efficiency and benefits, which together provided relative advantage to the organization. A majority of the participants expressed approval of IT utilisation for improving performance of their business processes. Workflow technology not only gave a firm structure to the business process but also enabled automated tasks which has improved performance overall in their department. According to the CRM service manager who commented on workflow technology adopted in his service area, which has helped the department in shortening response time to queries, in aligning work tasks and processing information. He stated:

Ref.1 "We look for IT solutions that can be effective for us and better for our residents. Something on the lines of saving us cost, increasing process efficiency and serving the residents as best it can be."

Seeking benefits through IT adoption for organization is common and this perception prevailed among the management of LGA_A as well. They opt for the technologies like workflows to gain benefits through IT efficiencies, which the non-conventional methods fail to provide. The policy and performance manager expressed this view as:

Ref.2 "Ultimately, it's about the benefits it will bring. If there were a desire to reduce paper due to regulations then one of the solutions would be to use emails instead of paper documents. They will print it out of their own expense. Hence IT will be one of the solutions. Same goes for workflow technology, if it can help us in policy formulation with some advantages and we can have better results compared to our current practices then it's seen as a sound solution and we'll implement it".

The IT head also emphasised the importance of benefits gained from using a technology as an important factor for any IT adoption. He stated:

Ref.3 "There are many companies out there that will sell the world to you but they won't actually deliver anything meaningfully advantageous to what you have already. Basically we end up seeing what benefits it can bring and how much that will cost, so cost benefit analysis something on those lines".

The findings from the interviews and business case report analysis revealed that relative advantage is a factor that is always present when decisions are made relating to any IT adoption. All the systems adopted with the workflow technology had ultimate aim of how much it will cost, how much it will save and what will be the benefits of having this solution as to what already exists within the organization.

ii. Complexity

Analysis of the data revealed that participants measure technology complexity on the basis of how much skills and training is required to optimally utilize the technology. The degree of training required determines the level of complexity associated with workflow technology that leads to impact on its adoption.

A majority of the participants and the business case report showed a consensus on the degree of training required as a determinant of how they see workflow technology as complex. When the IT head was asked to express his opinion on complexity issues with Aggresso systems for financial business need, he reported:

Ref.4 "I believe, to some extent decision makers consider the need of special skills requirements to operate a system, an example would be when we launched Aggresso for our finance department, one of the factors to be considered was how much training it will *require for the staff to effectively operates the system. After all, training cost both time and money".*

The findings revealed that the more skills and training workflow technology will require the more it will be considered as complex technology and the more it will create hindrance towards it adoption due to its associated training cost.

iii. Compatibility

In interpreting the empirical data, it appeared that IT and policy makers shared the same perceptions and views regarding workflow technology to be able to integrate with the existing IT infrastructure and to be compatible to work with collaborative systems they have. An insight was gained that new technology is not accepted easily if it requires replacements of old systems and the ways they have been carrying out tasks using technology.

IT infrastructure was one of the most frequently mentioned factors among the IT and the policy and planning departments. The senior managers at LGA_A mentioned that in every business case that is developed for the purpose of IT adoption, integration with IT infrastructure is mentioned as an important element before any decisions can be made. The policy and planning manager reported in this regard:

Ref.5 "Policy making is a collaborative task and for this we need input from many people. For instance, I was responsible to develop council annual plan and needed input from other departments. Head of policy department came up with an idea of using Dropbox, which was good idea to work collaboratively on a document. However due to Dropbox compatibility issues we had to drop the idea. Main reason was IT infrastructure in the council, which did not allow other users to download the software on their system as it can get into insecure network".

The IT head also emphasised the desire of the council to reduce costs by implementing technologies that are more compatible in long term. He reported:

Ref.6 "We have over 500 applications, so that's not compatibility that's what everyone buys what they need, but now the drive is to reduce that significantly. It's very important for any technology being adopted in LGA to be able to adapt to change, we are regulated *by central government, so rules change which affects the efficiency of the technology to serve the right purpose".*

Interview with the policy and planning head also highlighted the fact that new technology will be more readily adopted if there are no compatibility issues associated with legacy systems. However, nowadays suppliers do consider providing solutions that are more standard in order to reduce compatibility issues. He emphasised the significance of compatibility with the legacy systems by explaining with an example from the past:

Ref.7 "We're all using the Microsoft products, so we decide to use share point because to make savings, it will integrate with what we already got and it will enable other things to integrate with what we already got".

Considering the views and opinions of all the participants and documents it reveals that compatibility is one of the major factors that is considered by the decision makers for IT adoption and for workflow technology adoption it has the same influence.

iv. Timescale

The analysis of the empirical data revealed an IT adoption period as an emerging factor that plays an important role in decision making for any IT adoption. Most of the participants expressed their views on the time it takes to implement a technology and for it to be running, while results of implementation can be seen is an important perspective. The findings revealed that the timescale for the technology to be up and running is considered an important element of decision-making.

While collecting data through interviews some aspects emerged that were not mentioned in the literature, such as one of the participant mentioned implementing any new system consumes time and there is always a risk factor of how it will perform. Performance of the new system can only be seen after it has been implemented which means cost, time and resources have been incurred hence results are desired to be favourable. The policy and planning manager reported this point explicitly:

Ref.8 "Also roll out would be important and the length of time it takes to actually bed in new systems because again it is very easy to hand a check over and for them to deploy and give you access to a system but that system often takes about 12 months to go about *because the culture of the organization, it's something new there will be staff resistance and won't be familiar with it. All those sorts of things will then influence. So for instance you see a system and buy it but the benefit will be seen after 12 months then you won't go that route".*

Referring to workflow technology systems during the interview, the policy manager expressed his experience with Aggresso systems when it was deployed because it took 12 to 18 months to finally see the results. This was due to the time it took to integrate the system into the infrastructure and within the daily routine of the staff members in that particular department. Another service manager expressed his concerns, relating to deploying new technology, with resource allocation during the implementation process. Some staff needs to be taken off the job in order to implement the system which means making use of the staff in a productive manner. He reported:

Ref.9 "Funding is obviously important, but also what's important is being able to divide the time to take people off the job and to think what can we do for them and how can we allocate them to replacement jobs".

The adoption period can incur cost and wastage of time and money if the implementation time for a new technology is not calculated properly. Findings have revealed that the adoption period is as an important influential factor for decision making for workflow technology.

5.4.3.2 Organizational factors

During the interviews, the participants perceived organizational factors significant for the adoption of workflow technology in LGA_A. Some of the factors that have been confirmed through interviews were Managerial support, Cost, Information intensity, whereas Attitude and Organizational Structure did not have significant impact on adoption phenomenon. Stakeholders emerged as an important factor that has not been mentioned among the two theories selected in this study. Evidence and explanations for the organizational factors are presented below:

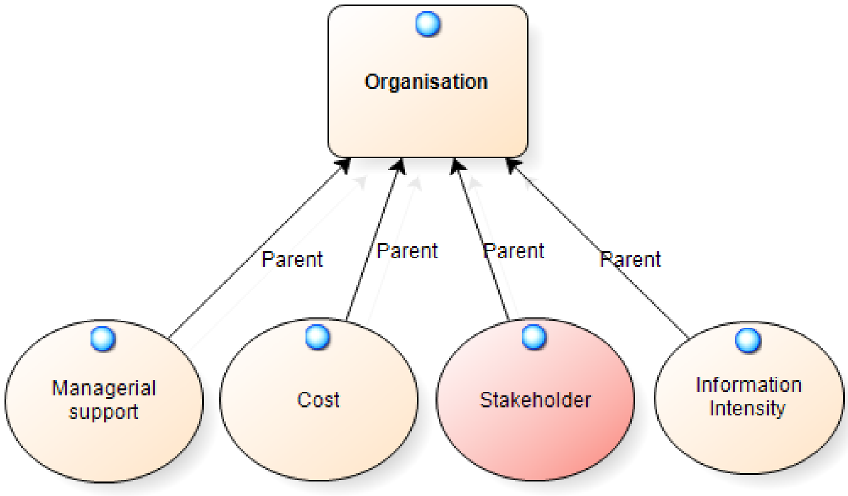

Figure 5.3: Organisation factors LGA_A

i. Managerial support

During the interviews it appeared that managerial support plays an important role in influencing decisions to adopt workflow technology. The majority of the participants from each category identified managerial support as a significant factor for workflow technology adoption. Expressing their views on Agresso systems adoption, managerial support acted as an impetus in the adoption process. Senior managers' involvement in the decision-making spurs the adoption phenomenon by communicating with top management, getting approvals faster and influencing budget allocation. Once senior management was convinced of the benefits of using Aggresso for the finance department they were able to refer to higher authorities and obtain endorsement. The policy manager said during the interview:

Ref.10 "… support from the management pushes projects from paper to reality, they lead the team working on a project and helps in getting all sorts of help and get the support that they might need for the project, for something that is crucial".

The findings revealed managerial support as a vital factor that influences the decision-making process. All the participants had a collective response to the significance of managerial support for workflow technology adoption. Responses from the participants also revealed similarity between the impact of managerial support on workflow adoption and other IT adoption. As reported by service manager at LGA_A:

Ref.11 “The role of the departmental heads and managers are important for endorsing IT adoption, like in any organisation for any project”.

ii. Cost

A mutual agreement can be seen among the participants on cost playing the most significant factor in determining the adoption of IT. The rational motivation behind the decision to adopt the Agresso solution for the financial department was mostly based on reducing the cost. While interviewing the user of the system and asking him the motives behind the adoption of Agresso as a financial solution for LGA_A, he expressed his view on the reasons behind the adoption of the technology as:

Ref.12 “One of the reasons why Agresso ERP solution was adopted was we wanted to keep the costs down and streamline procurement practices without sacrificing control”

The researcher investigated further to find out why it has led the LGA_A to adopt a modern and innovative technology to handle financial matters with the organization. It was found that the major stimulating factor behind the adoption was reducing cost. The IT head explained as below:

Ref.13 “... primarily change has occurred to the amount of money we are given to provide the services which meant we had to find new and innovative ways to deliver the services at a lower cost”.

This argument was further supported by the policy and planning manager who described his selection of solution depending on the cost of the technology. He reported:

Ref.14 “Within that what we do on quarterly basis is how the council performs. We call that integrated performance monitory report. That is produced via Excel. It’s a complicated excel system that we have, series of macros and series of formulas and worksheets which are linked together. We could automate all of that and purchase an IT systems which will cost us about 40,000 pounds. We don’t have forty thousand pounds, the excel systems costs about three thousand pounds, so in terms of barriers cost is one of the biggest factors”.

All the participants reported cost as a major deciding factor for IT adoption and it has the same influence on workflow technology adoption. Findings from the documents also revealed significance of cost as a decision making factor. The LGA_A council constitution document also supported cost as a major factor as it mentions one of the procurement standards to be reducing costs and making savings. It was also reposted in the document as a key factor in executive decision-making.

iii. Attitude

The characteristic of attitude was revealed in employee's resistance to change. Their behaviour viewed as in acceptance and rejection of a change in the organization led to the analysis of attitude as a factor that might influence the decision for the adoption of technology. The findings revealed that attitude was not accepted as an influencing factor in the context of LGA_A.

During the visit to the organization it was observed that the majority of the departments were dependent on technology for their daily tasks. Facilitating routine tasks through utilization of technologies such as up-to-date desktops, laptops, scanners, i-pads, digital printers etc. This also showed that people working in LGA_A are accustomed to using technology and there exists computer self-efficacy. Moreover a review of the constitutional document affirmed the ICT trend in the council, which stated that all the members of the council are authorised to use an ICT allowance worth £250. The service manager reported:

Ref.15 "There is a lot of new blood coming to the organisation, which is already technology savvy, and they adapt easily, keen to learn and accept changes in the organization".

The participants mostly expressed their views and opinions on how management supports and communicates change to the employees that fades resistance to technological change. Within the premises of LGA_A it was observed by the investigator that some of the meeting rooms were booked with staff being trained on different programs. Along with the workshops, training materials were handed out to the staff to support them in feeling comfortable with the new program. The policy manager highlighted how communication and management support removes resistance to technological change, he report:

Ref.16 "Colleagues sometimes are resistant to new stuff, but as long as you have a process to take them through it such as training, to make sure they are familiar with it, *workshops and briefings to make sure they know it's happening and what's going to be required of them. Ultimately we need to save money and we need to see what level of benefits we are getting from a certain technology. Then there is not really a choice, staff might not like it but they are expected to cooperate. But we do like to take employees with us rather than forcing upon them new technologies, but having said that employees are expected to learn and grow rather than show resistance".*

Analysis further revealed that the management of LGA_A does not see its employees resisting technology but that their job status that can create hesitance. The IT head explained:

Ref.17 "… is there resistance to technology change or is it the resistance to social change? The answer to that is people don't resist technological change it's the social change. If I am going to get a new laptop for the old one, what's going to happen to my job? Am I going to be able to do the same things, will my job be at risk? So it's the social change and it is down to how the management articulates the change and take people with them".

iv. Organizational structure

The majority of the participants did not recognise organizational structure as an influencing factor for workflow technology adoption in LGA_A. They see their organisation to be flexible enough not to create any hindrance in the decision making process.

Most of the participants suggested that LGA_A had a flexible organization structure. Decision-making is not usually hierarchically dependent and the process is fairly fast. One of the reasons attributed to such level of flexibility in the structure of the organization is that each department has its own individual budget for providing services and IT infrastructure. Hence, making them decentralised and more independent in decision-making regarding IT procurement. The service manager commented on this point as:

Ref.18 "… it depends how much is being spent, our organization is very flexible. The only constraint we have is the procurement, so if something is up to £50,000 or less than a conversation between the managing director and me is required, we can make a decision on it. So it's the only constraint by the decision making process. Most things tend to go *reasonably quickly, not lot of debate, we put things in and they go through the process. It's faster".*

A similar view was collected from the policy and planning manager who stated:

Ref.19 "Organizational structure is not necessary important. So if you have senior management commitment then it does not matter what is the structure of the organization. So there are some things which are more important".

v. Information intensity

Analysis of the empirical data collected from LGA_A suggested that all the participants shared the same views and opinions on the adoption of technology for processing large information. LGA_A is a public service organization, which provides services to the local residents. This implies a large storage of data is required to provide the right services to the right residents of the community. Processing a plethora of information produced by data entry of the residents and hundreds of daily queries put forward by the residents requires technological help for accurate and efficient information processing to deliver quality services. The service manager expressed a similar view and he suggested:

Ref.20 "So 60,000 household multiply that by 2.5, you will get 150,000 people. And if you want to ask them a question you get anywhere from 0 to 150,000 responses to process that and make anything meaningful actually you need some kind of technology to do that".

It was observed that LGA_A operates as a public service provider to the residents of the community, which generates information both internally due to the large size of the organisation and externally through its residents and thus demands technological support. The policy and planning manager expressed his opinion on the rationale behind the motivation for adopting technology by stating:

Ref.21 "There is a workforce of 6000 that is hired by the council, excluding the teachers, which raises the number higher. HR and payroll departments are regularly collecting staff information, their holidays, sick leaves, salaries and much more. All this cannot be done efficiently and timely without the help of ICT".

vi. Stakeholders

From the interpretation of data collected from LGA_A, stakeholders emerged as a favourable factor. Stakeholders were mentioned by several participants when they were asked to indicate who were the people involved and responsible for decision making when it comes to IT adoption.

During the interviews with the participants a new theme was highlighted when explaining their view of the importance of the roles involved in decision-making. When a new technology is adopted a business case is prepared for the endorsement of the project. This report incorporates the views of all those who are somehow involved or are effected by the adoption of the new technology. It is in the stakeholders' interest that their needs are echoed in the business case, which forms part of the negotiation to endorse the IT project. The policy and planning manager expressed his view in this regard as:

Ref.22 "It really depends who the stakeholders are involved. If it's on a bigger scale then IT head will be involved, council head will be involved and department head will be involved. So for instance any decision that the council make over the SharePoint adoption will involve the head of IT, managing director, policy manager and policy and performance head will be involved because that's specific to this department".

5.4.3.3 Environmental factors

Data collected from LGA_A indicated competition was not a significant factor in terms of adopting a technology. Instead a new factor emerged which is imitative pressure, which was not present in the initial conceptual framework. Environmental factors that have impact on workflow technology adoption as perceived by the participants of LGA_A are government regulations and imitative pressure.

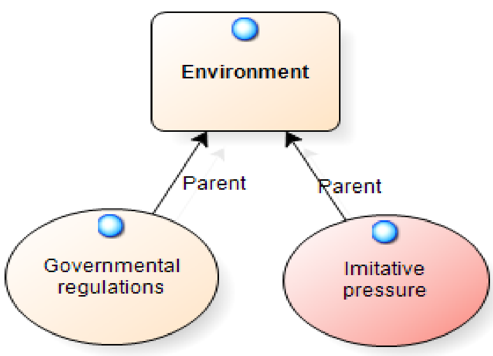

Figure 5.4: Government Factors LGA_A

i. Competition

Interpretation of data suggested that competition in the public sector does not exist as seen in the private sector. LGAs are responsible to deliver services to their principal areas only, which does not create any competition among the LGAs on service delivery to the residents. When the policy and planning head was asked to give his view on what makes public sector different from the private sector, he stated:

Ref.23 "… what also makes LGA different than private sector is we are not into competitive race like the private sector. Local residents can only come to us to avail services. Like if you are the resident of Windsor Borough then you can only go to Windsor council not Slough council. So there is no competition between the councils but we do influence each other in some ways.

The level of influence created by LGAs on one another could be seen on quality of service delivery. This sort of influence enhances the standards of each LGA and promotes efficient service delivery to the residents. LGAs can be rated among their own domain, which can create some level of competition, but business wise there exists no competition.

ii. Government regulations

One of the influencing factors found from the analysis of the data collected from LGA_A was government regulation and decisions to adoption IT in general is affected by the legislations and regulation.

The participants reported in the interviews that central government does not have direct control over the LGAs, however cuts in budgets allocated to LGAs, improving quality of services being delivered to the citizens, promoting environmental protection etc., all at the end has an impact on what they procure, how they utilise technologies and quality of services delivery standards. The policy and planning manager elaborated on this point by reporting:

Ref.24 "We are directly influenced by the central government and the legislations which requires us to deliver the services in a certain effective way. Like keeping citizens data protected, minimizing the amount of paper being used, increasing transparency, and service delivery times. So certain legislations set out our standards too".

Similar views were expressed by the IT head, explaining government can initiate the need to adopt technologies by allocating ICT funds and reduction in funding can lead to lower cost and improved savings, which sometimes requires LGAs to optimise on what already exists and sometimes take help of new technologies. He reported:

Ref.25 "We get our funds from the central government and big cuts from the government side effects our services and we have to find innovative ways to lower cost".

iii. Imitative pressure

Interestingly enough empirical data revealed imitative pressure as an emergent factor from the interviews conducted in LGA_A. Decision to adopt Agresso was partly influenced by its productive utilisation among other neighbouring LGAs.

LGAs tend to consider how a specific technology has proven to be useful in other LGAs to help them decided on technology adoption. Participants generally agreed on the existence of neighbouring council's influence on some of their decisions seeking to improve a business process. However, some believed that it might influence but in the end the decision is made on what best suits their organization only. The policy and planning head explained as follows:

Ref.26 "… if you see something other council has adopted, and that has been beneficial, then we would certainly consider it. So if it's a good idea, and it's working elsewhere, then you will definitely look at it. It does not pressurize us, but influence in a way that it has been beneficial and works in one council might do the same in other".

5.4.3.4 Task Technology Fit

Technology's capability to meet the task requirements in the best possible way is a fit, which was expressed by the participants during the interviews. The findings revealed the importance of task technology fit for decisions to adopt workflow technology.

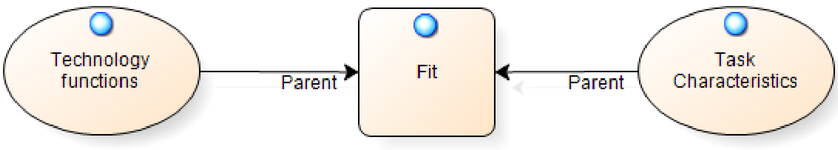

Figure 5.5: Task Technology Fit LGA_A

Participants echoed frequently task technology fit as one of the major factors to positively influence the decision to adopt IT. To explain the importance of the fit between the technology and the purpose of use, the IT head who is directly involved in decision making and procurement of IT in the council, expressed the importance with an example:

Ref.27 "... silly example, mobile phone, should we go with Blackberry, should we go with iPhone, should we go with Samsung, should we go with Android or or or... if they are all the same price what will be the decision process, then the decision process comes down to what's the best phone for need of the business . . . it's a little bit chicken in egg".

Similarly the policy manager supported views when he was asked to comment on workflow adoption in the LGA_A. He defined the process of IT adoption and how task technology fit makes an integral part of the decision making process and is one of the factors that is considered for all the technologies adopted in the council. He reported:

Ref.28 "At that stage we then go through a formal tendering exercise. Invite bids in, you will write a specification of council needs and companies will then say we can provide you all of that and this is our price level. We then short list companies that can provide solution that meets best the council needs and make decisions on that basis".

5.4.3.5 Task characteristics

For the purposes of the analysis task characteristics were investigated first to find out what are the different tasks involved in the finance department and to find out tasks involved in the policy and planning department for later discussions. Four major factors were revealed from the interviews in support of task characteristics, generation, choice, combination and collection as shown in figure: 30.

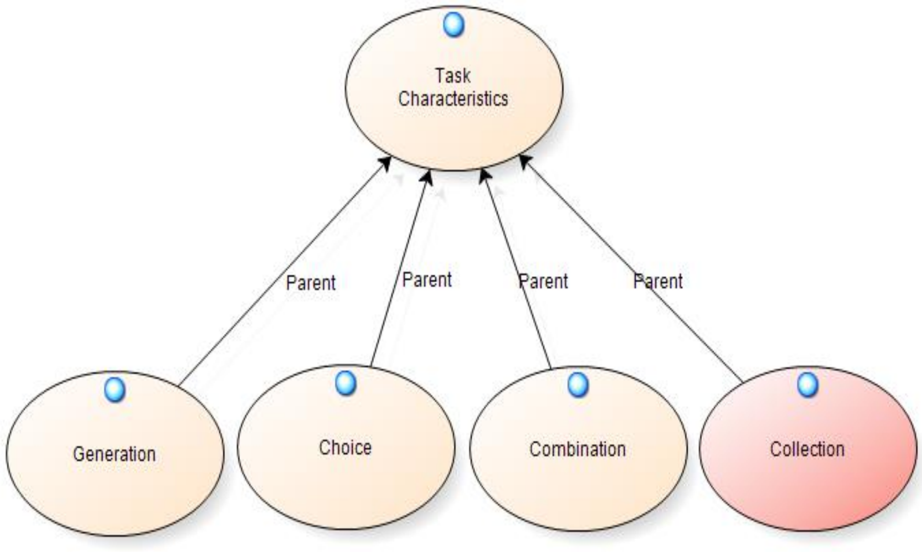

Figure 5.6: Task characteristics LGA_A

i. Generation

In investigating the characteristics of tasks involved in the finance department, the findings revealed that there is an exchange of information taking place. It was observed that reports are generated and distributed among the departments on a regular basis. This highlights involvement of tasks in the finance department where information is generated. During the investigation of the characteristics of tasks in the finance department of LGA_A, the service manager reported:

Ref.29 "On a regular basis it's about planning and budgeting. We have to generate reports, figures (early bird) to be distributed among the departments, share appropriate financial information with senior managers. It's, about communicating with the organization about expenses, budgets, savings etc., …".

Similar views were found in the policy and planning department for the characteristics of tasks that revealed the generation of ideas, options and reports for policy formulation. Policies are made after different views and opinions are generated among departments within the LGA, partner organisations and residents. These are reviewed, and appropriate policies are selected and published for the members of the organisations and residents. The policy manager at LGA_A explained the generation characteristic of policy making process as:

Ref.30 "... he will be then responsible for developing that area, liaising with all the relevant agencies, any other person in the council that will be interested in this, looking out what other councils are doing, looking out what think tank says, what government says and then once you are done with all that kind of research, you will then be writing a paper the paper will set out a series of recommendation to say, we want to adopt this policy, the policy says x,y,z, and it entails this this this .. it will deliver this this this and this is how the local residents will benefit".

ii. Choice

The choice characteristic represents tasks involving decisions and concerns selection among the alternatives. When the participants were asked to describe the tasks they described them as activities involving decision-making and making selection among the options that refer to task characteristic choice.

Findings from the interviews revealed that decisions are made regularly in each department about its specific business needs. Policy makers are making decisions on policy options to match the best policy to the right purpose. Similar tasks where decisions are made from a collection of options exist in other departments such as in finance the finance manager reported:

Ref.31 "... there are many important decisions we have to make in terms of budget, how financial resources are allocated across the organisation which got to be accurate so using Agresso that helps in processing information for us accurately and we can have a better control how resources are moving around the organization".

A similar scenario in policy and planning department mostly exists, where policy alternatives are selected and appropriate decisions are made at the management level and in the cabinet. The policy head explained:

Ref.32 "... cabinet reviews all the options, the benefits it has for both the council and the residents and a series of decision making then it will endorse that paper or not, as the case may be taken differently they endorse it then that becomes the formal policy of the council and in of that stage we have to start thinking about how we are going to deliver".

Thus, analysis of the interviews, documents and observations indicated that selecting options and making decisions in different roles in the LGA_A, defines choice as one of the characteristics of the task.

iii. Combination

Findings from the interviews revealed that some tasks exist in LGA_A that require the generation of ideas and decisions are made. Such a case exits in policy making when from the consultation residents views are generated and selected ones are used for decision making on policies. Similarly, in corporate departments of LGAs information is generated on the basis of collected feedback from the departments and analysed to develop reports. Such activities within a business process describe task characteristics as combination.

Analysis revealed that participants from different departments expressed similar views on having analysis and reporting tasks within their business processes. A service manager reported from his department’s perspective as:

Ref.33 “… part of the job is to analyse change, advice colleagues and support for sound business decisions. It includes collecting information, doing some research, analysing the information, drawing some valid options and help in making concrete decisions”.

Further interviews revealed that creating options/ideas and using them to make decisions plays an important role in policy formulation in LGA_A. The policy and planning head reflected on this and reported:

Ref.34 “We need to communicate our policy and changes with the residents and for that we require a mechanism to share information and collaborate on policy formation. Policy formation is a collaborative task, between the residents and council and between the departments within the council. We are analysing, controlling and monitoring policies continuously to develop policies that will work for both the council and the residents”.

iv. Collection

Analysis of the data and the observations revealed that there is an extensive activity of collection of information in LGA_A through public consultations residents and partner organizations’ feedback are collected to be used for policy formulation.

Collection is a task that is vital for information processing and making valid decisions was the perception of most of the participants. All the reporting and analysis is based on the meaningful information collected from departments, residents and other parties involved with LGAs. The service manager expressed his view on how significant collecting of information is by reporting:

Ref.35 "We have to collect and collate a wealth of information across the service departments, corporates, partners, suppliers, all the payments, invoices etc. to have a better analysis and to create financial reports…"

The findings revealed that in policy formulation citizens' opinions are collected for formulating policies that would best suit them and work along with the council's vision. The head of the policy and planning department noted:

Ref.36 "… So that is, you do have instances like that when you are developing a policy, where it's relevant to engage local people there's usually a consultation that takes place. And that's sort of 30 days consultation, seeking the views of the local residents in that process".

5.4.3.6 Technology functional support

Technology functional support describes the capabilities of the technology that can serve different task purposes. Analysis of the empirical data collected from LGA_A revealed communication support, information processing support and process structuring support as workflow technology functional characteristics as shown in figure 31.

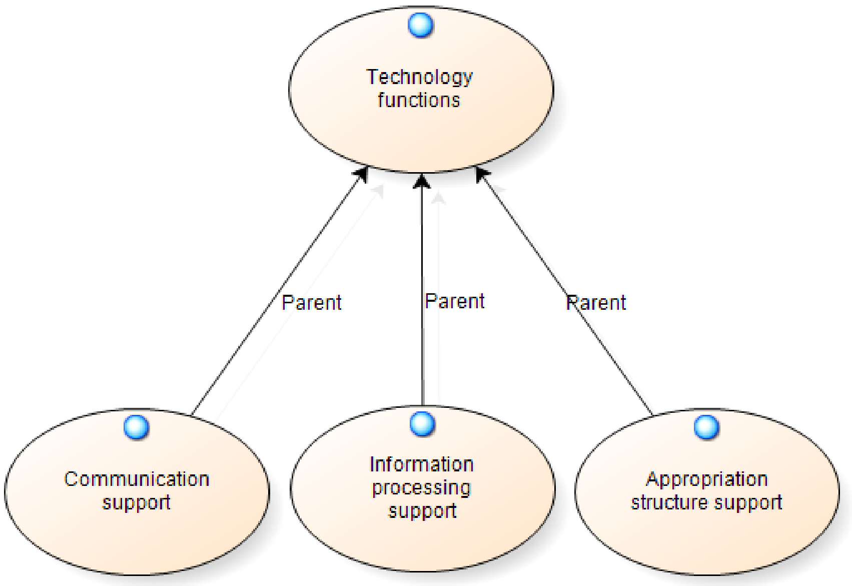

Figure 5.7: Technology functions LGA_A

i. Communication support

Findings from the interviews, documents and observations at the site suggest workflow functions allow participants to work collaboratively on tasks and share information across the LGA and outside the organization with residents and organisational partners. Participants perceived information sharing and collaboration capabilities of workflow technology to support the communication function of the technology.

It was observed that the IT head was able to share information on his mileage claims through workflow technology with the finance department. This information was sent to the finance manager, who approved the reimbursement of the claim and sent approval to the payroll department that will reimburse the IT head for his claim for mileage in his next salary payment. The IT head shared his view on flow and sharing of information and reported:

Ref.37 "… things that allow effecting information sharing and communication between the finance and HR department with the rest of the service departments is Agresso that allows us to enter data and collaborate from multiple sites. Efficiency in information sharing and collaboration makes effective communication, which is quite vital for any organization to have".

The documents such as Agresso business world and Agresso business case study further reinforced the ability of the system to allow users to collaborate on processes and documents from various business units. The LGA_A constitution document, also promotes the concept of collaborative work and sharing information and it states:

Ref.38 "... to encourage joint working and promote the sharing of information, resources and skills between public, private and community sectors".

ii. Information processing support

In investigating the information processing support in workflow technology it was found that large information was collected and processed using IT that was workflow technology based. LGA_A is a public service provider, which makes it information intensive operationally. Hence, information processing is a function of workflow technology, which is proven to be a useful function for working with large information.

Apart from the information flow from the residents and partners for policy formulation, there is large information generated by the employees and job applicants. The policy and planning manager reported:

Ref.39 "In our council we have about 6000 employees with a lot of paper work going on. Agresso HR and Payroll systems help in processing large amount of data relating to existing employees such as staff salaries, over time, tax deductions, holidays, appraisals, and information relating to applicants for jobs".

The IT head expressed some of the benefits of using workflow technology and he reported:

Ref.40 "The system has what you call user defined built-in-workflows, so it's an employee self-service option that basically allows employees to accurately put in information relating to HR and payroll. So something like holidays, sick leaves, reimbursing claims... something like that".

iii. Process structuring support

Investigation into the functions of workflow technology used in LGA_A revealed that workflow technology has functions that allow users to have control over information and automation of process-oriented tasks. The finance officer elaborated on the useful function of Agresso technology that not only allows control but also qualifies users according to authority level. This also decreases security related issues for handling confidential information. He further explained:

Ref.41 "… currently we have got Agresso for Finance, HR and Payroll. There are workflow systems involved in that which outlines who approves what, enforces limits on approvals and sets a number of people required to authorise something critical in nature. If for instances, I want to reimburse a claim made and my manager is on leave, this can be authorised by another colleague whose name exists in the system to authorise certain tasks and actions".

The IT head had similar views on the adoption of Agresso technology and he reported:

Ref.42 "The HR department has seen improved communication, monitoring, control and delivery of HR functions with the adoption of Agresso HR and Payroll system, having embedded workflows in the solution which makes it possible. An example I can give you would be.. HR department can control the information flow from department to department and also how much information is appropriately shared, who are authorised to view the information…"

5.4.3.7 Summarising the findings from empirical data LGA_A

Examining and analysing data collected from the case study LGA_A it was revealed that the majority of the factors selected from the literature were confirmed by the participants, however, some were not found to be significantly influential for decisions to adopt workflow technology and some new factors emerged from the data. Investigating technological factors, the data revealed timescale as an emerging factor. Timescale for IT adoption determines how resources will be consumed and how much will be stand-still incurring cost and loss and vice versa. A longer time taken to implement IT can delay service delivery and impede connected processes leading to dissatisfied customers. Hence, considering timescale during the decision-making process for workflow technology adoption is an important factor for saving time and cost. Analysis of organisational factors revealed that attitude and organisational structure were not significant enough to influence the decisions for workflow technology adoption. Through effective communication employees are motivated, benefits are highlighted and proper training provides a comfort level to use the technology. Such methods have reduced negative attitude towards new technologies among the employees. Moreover, it was found that a flow of employees possessing sound knowledge of IT has also reduced resistance to IT adoption in LGAs. Organisation structure was found to be non-influential due to decentralised decision making and individual budget allocation to the departments. Flexibility and autonomy among the departments allow decisions to adopt IT faster and without hindrances. Stakeholders appeared to be important for decisions to be effectively taken as all the views of the effected parties could be taken on board before decisions are made. Corporate implementation of IT would involve more stakeholders as the scale of the IT project affects a wider range of the staff in LGA_A. Investigation of environmental factors revealed competition to be non-influential and imitative pressure emerged as influential for workflow technology adoption. Due to the nature of the public service provider of LGA_A, it eliminates competition among the LGAs significantly but on the other hand LGA_A considers what technologies are adopted by other LGAs for reference sake and to confirm beneficial utilisation of IT. The decision to adopt Agresso technology was also influenced by other LGAs successfully utilising and reaping benefits from it. Lastly, collection emerged as a new factor from the data for task characteristics. Analysis showed collection of information in terms of reports, applications, requests, consultations with users and residents creating an influx of information in LGA_A. Table 5.4, summarises the findings from case study LGA_A for a holistic understanding.

No.	Factors		Interviews	Documents	Observations	Confirmed	Emerged
1.	Technology	Relative advantage	Ref.1, 2, 3	✓		✓	
2.		Complexity	Ref. 4	✓		✓	
3.		Compatibility	Ref. 5, 6,7	✓		✓	
4.		Timescale	Ref.8				✓
5.	Organization	Managerial support	Ref. 9,10			✓	
6.		Cost	Ref. 11, 12, 13	✓		✓	
7.		Attitude	Ref.14, 15, 16	✓	✓	X	
8.		Organizational structure	Ref.17, 18			X	
9.		Information intensity	Ref. 19, 20		✓	✓	
10.		Stakeholders	Ref. 21	✓			✓
11.	Environ	Competition	Ref. 22			X	
12.		Government regulations	Ref. 23, 24			✓	

13.		Imitative pressure	Ref. 25				✓
14.	TTF	Fit	Ref. 26, 27			✓	
15.	Task	Generation	Ref. 28, 29		✓	✓	
16.		Choice	Ref. 30, 31	✓	✓	✓	
17.		Combination	Ref. 34, 35				✓
18.		Collection	Ref. 32, 33	✓	✓	✓	
19.	Function	Communication support	Ref. 36, 37	✓	✓	✓	
20.		Information processing	Ref. 38, 39			✓	
21.		Process structuring	Ref. 40, 41			✓	

Table 5.4: Summary of findings from LGA_A

5.4.4 Background to LGA_B

LGA_B is a unitary council located in the north of Wales with 59 councillors and 38 wards (local areas) to cover and with a total population to serve of 115,200 according to 2011 consensus. LGA_B employees approximately 6000 people, who are working in the service area of health and social care, environment and planning, education and learning, housing, leisure and culture, transport and streets and business. The council has a set guideline known as a constitution which outlines how the council should operate, how decisions are made and what procedures are taken to make sure the council operates with transparency, efficiency and is accountable to the people (The Constitution, 2012). The council sets its budget and policy frameworks by conducting meetings with the council members and the cabinet. LGA_B receives queries through telephone calls, walk-ins and via a web site on a daily basis, which is facilitated by ICT.

To collect data from LGA_B interviews, documents and observations were the multi-method of data collection. There were six participants from different levels of the hierarchy and belonging to policy making, IT and service departments as shown in table 5.5. Other means of collecting information was through LGA_B's website and IT suppliers' websites for additional evidence. Hence, the multiple methods of collecting data from LGA_B improved the quality of data collection and provided richer information to analyse.

	Category	Job title	Number of participants
LGA_B	Policy makers	Policy and planning manager Policy and planning officer	1 1
	IT	IT head IT support manager Project manager	1 1 1
	User	Payroll manager	1
	Total		6

Table 5.5: Participants from LGA_B

5.4.5 Application of workflow technology in LGA_B

LGA_B is investing resources in IT to provide better and more efficient services to its residents and maintaining its pace with the e-gov trend increasing in the public sector. In its pursuit of being an IT efficient organisation, LGA_B has won the best IT service provider award from the Society of IT Management over 650 public sector organisation in the UK. The IT department of the organisation is responsible for providing a full range of IT services to all its departments which also include adoption, implementations, research and development in IT. The department is divided into four domains to cater productively to all the needs of IT in the council which are IT services, IT systems, IT support and e-government.

LGA_B has adopted a range of IT throughout the organisation that is based on workflow technology. Such technologies are Electronic Data Management Systems for recoding and managing data, PARIS systems for social care services and iTrent which is a business solution for HR and payroll functions. These technologies have been adopted for achieving efficiency in performance, saving costs and gaining benefits. Due to its information intensive business nature, IT is adopted to facilitate information processing. The IT head described the need to have iTrent for its large number of employees working in the organisation and generating a huge quantity of information by commenting:

"It is a very big system and we have about 6000 people who get paid every year, so it's a big system that has many workflows to suit particular requirements".

iTrent technology is provided by the suppliers as pre-configured to a certain degree with areas that are maintained and developed according to the user needs and requirements, which the IT team in the organisation is well, trained to provide. The previous version of iTrent was Trent which was a corporate workforce information system implemented in 2005. The reason to adopt the upgraded version of Trent version 6 was due to the previous version's inability to meet the modern business requirement of transformation across the authority. Business needs changed and evolved which required the technology to match at its best. Another reason was that Trent version 6 was not compatible with the server upgrade that was supported by Microsoft. Therefore, iTrent was adopted to meet the business needs and compatibility with the other systems. The project manager for iTrent implementation commented on the reasons behind the adoption of the new version as:

"There were a few reasons really why we adopted iTrent. Firstly, we wanted to modernise the way we work really. As I said, some of the processes were very paper based. They were also not going to support the server that the old system was on. So there were sort of practicalities around why we need it. And we decided to go for iTrent because there were many other authorities that were using iTrent as well and it just seemed a natural progression really. Also, if we need to work collaboratively with other areas, we are on same system really".

The major benefits perceived for adopting iTrent was gaining benefits, achieving efficiency in processes, greater communication capabilities, increased security through role resolution functions, potential to support collaborative work and supporting the green agenda by reducing paper and travelling claims.

However, these benefits have not been realised in the policy making context of LGA_B. Much of the process is paper based and lacks technological efficiencies. Empirical data collected from LGA_B suggests participants believe adoption of IT to facilitate policy making can add efficiency to the process along with benefits and savings. However, due to limitation of solutions catering to policy making needed in the market, it has not yet flourished in the policy making domain. The policy manager at LGA_B commented:

"… there is not any system for policy making in the market that we could buy in and put it in so there's no system out there to help us. You know iTrent helps us with payroll and HR, and have EDRMS for paper storage but we haven't got any system out, which I am aware of, that could help us with policy making like routing task, assigning responsibilities etc.. like workflow automation does. I think there is a gap in the market and that's the issue".

5.4.6 Contextual and functional level factors for workflow technology adoption

Exploring for factors influencing workflow technology adoption in LGA_B comprised of a multi-method technique that included interviews, documents review and observations. These methods have allowed the investigator to draw some findings for technology, organisation, environment and task technology fit factors that confirm the proposed conceptual model and extend through implications from practice. Analyses of these factors have been presented as follows:

5.4.6.1 Technology factor

Findings from the empirical data collected from LGA_B shows participants perceived Relative advantage, Complexity, Compatibility and Timescale out to be influencing factors for workflow technology adoption in the policy making domain as shown in figure 5.8.

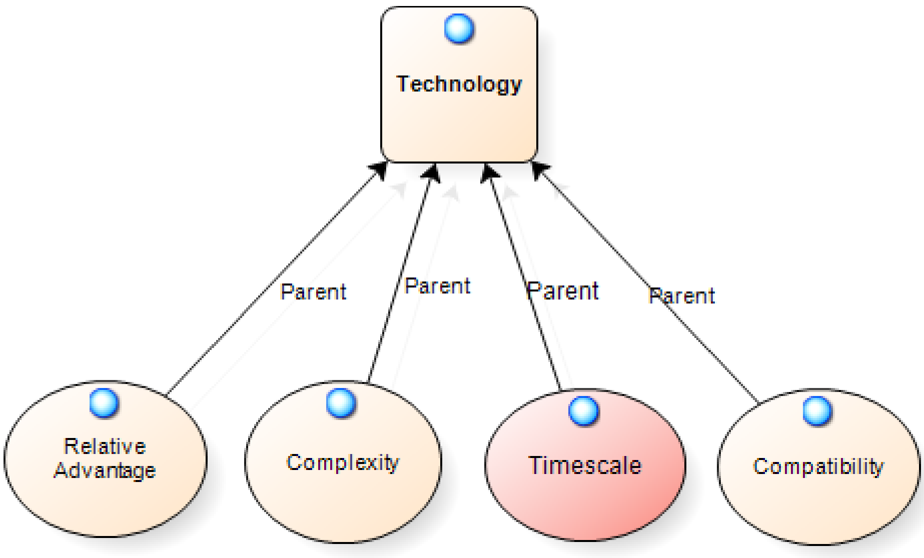

Figure 5.8: Technology factors LGA_B

i. Relative advantage

Two items stood out as important themes indicating relative advantage perceived by the participants in LGA_B. These are benefits and process efficiency, which were mentioned in the interviews by the participants that lead to relative advantage and which has influence on the decision-making process of workflow technology adoption.

During the decision making process, one of the factors, which is given utmost consideration, are the benefits. Participants perceive benefits to be justifying the cost incurred in IT adoption. Another element seen by the participants in LGA_B was the adoption of technology for achieving efficiencies. Together they were considered to increase relative advantage for adopting the technology. The head of the IT department responded to workflow technology adoption factors by reporting:

Ref.43 "What we usually have is a project initiating documents, a business case, it says what we are going to do, what the system will do and usually there's a post implementation review so we will map what we were planning to do with the system and what the system has actually achieved. We don't do every time cost benefits analysis, but mention what the budget is and what the benefits are and how it will improve the performance and efficiencies".

An analysis of the business case document for iTrent adoption revealed an aim to achieve efficiencies in the performances of HR and Payroll, which the prior system was not able to deliver. Most importantly, one of the benefits of adopting iTrent was that it was seen to be far better than the older version.

ii. Complexity

Complexity has influence on decision making when it comes to workflow technology adoption and this phenomenon prevailed in the interviews conducted in LGA_B. Participants perceive a need for IT training as a source of complexity of workflow technology and its impact on decision to adopt.

When adopting workflow technology in LGA_B, training needs were considered during the decision making process and an assessment was made of how much training will be required for the staff to benefit from the utilisation of the technology. The project manager responsible for implementation of iTrent expressed her views on training needs as a positive influence on adoption due to its least requirement of training and she reported:

Ref.44 "It's very straight forward it's little bit like when people started using banking, buying online, it's that simple. Literally, I have a screen with few buttons only. Click it, its self-explanatory. I guess in that way the benefit was that they felt that training on that side of thing for the users was minimal".

It was observed that staff members were being trained on iTrent to eliminate any level of discomfort in using the technology to its optimal potential. As the majority of the respondents thought IT training was an important factor indicating that the technology is complex but on the other hand interviews also revealed that IT training was not a barrier for adoption. The IT head at LGA_B reported:

Ref.45 "I think it's important to see if the users require training as we want them to be comfortable to use a system but then again it's not something that we will consider to reject a system".

iii. Compatibility

On investigating the compatibility factor in LGA_B, it was found that participants perceived it to be an important factor for workflow adoption. They described compatibility as an important factor to be able to integrate with legacy systems and IT infrastructure.

In order to save cost and make use of existing systems, technology compatibility with legacy systems is perceived by the participants as an important element in decision making. Every business case prepared for decision making makes sure it highlights the compatibility issues, if any exists, with the legacy systems. For iTrent to be adopted it was reported in the business case its compatibility with electronic document record management systems (EDRMS) which existed already in LGA_B as a big decision making factor. The project manager for iTrent reported:

Ref.46 "There is some sort of criteria, we check obviously what's currently used at the moment, is it cost effective to use it, is it viable, does it interact with the other system that we got should it need to".

Analysing the iTrent initiation project report, it reveals the main reason for iTrent to be adopted was to replace its former version due to compatibility issues with the upgraded database system. On the other hand there were views on how suppliers are playing their role to minimise compatibility issues as an added benefit. The IT head reported:

Ref.47 "... nowadays systems are very standardised. Suppliers are always looking to provide the market with standardised solutions as a benefit to its customers. So I would *say compatibility is not such a big issue but yes we do consider how much it is compatible with existing system.*

iv. Timescale

Timescale has some influence on decision making for workflow technology adoption in LGA_B. Analysis of the business case and interviews revealed that participants believed it is important to consider the time period of the technology implementation to reap benefits, as a deciding factor for technology adoption.

Time is part of the organization's vital resources, which need to be productively consumed for business success. The same view prevailed among the participants who perceived time as a vital factor that can incur costs on the organization and waste of valuable resources if not managed properly. The project manager expressed her view as:

Ref.48 "And also the cost and time to some extend like going out and looking at something totally brand new, so to change totally was more about investment in time and effort as well.

5.4.6.2 Organisation

On exploring organisational factors in LGA_B for workflow technology adoption, it revealed managerial support, information intensity, stakeholders and cost as major factors affecting the decision to adopt workflow technology. Analysis and discussion of these factors are presented below:

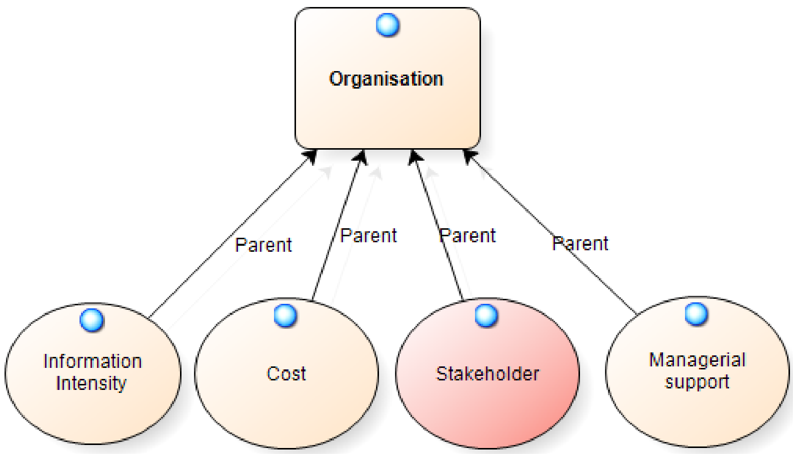

Figure 5.9: Organisation Factors LGA_B

i. Managerial support

On investigating the managerial support factor for workflow technology adoption in LGA_B, it was revealed that senior managers play an important role in new technology adoption. Managerial support is important for any technology adoption, project implementation and major decisions in the organisation. It acts as a stimulant and spurs the process of an event. In terms of workflow adoption in LGA_B, managerial support facilitated the adoption and implementation of the technology, using its influence over the team to speed up and guide the direction of the workflow technology adoption process to completion. The project manager who was the in-charge of the iTrent project expressed her opinion on the importance of managerial support for successful implementation of technology by reporting:

Ref.49 "... for our project, top management has clearly said where they want the project to go, they've taken a corporate view, they haven't let the department say what we'll do and what we won't. So that's been quite a positive experience for us as a project team. We've had a clear steer, it's going cross services. And they were also very clear about time scales when they want to implement, by so again, the driving force and asking people you know either to do things, who'll be involved quickly, that was positive as well. So definitely that's a key".

ii. Organisation structure

Another factor that was explored during LGA_B data collection was organisational structure. The results of the analysis showed that organizational structure did not have much influence on the decision to adopt workflow technology. Effective arguments can be seen in the involvement of senior managers who are taken on board and the individual *budget allocation* to departments fades away the rigid influence of organisational structure.

The head of IT at LGA_B, believed that due to its own budget the organisational structure failed to have a significant influence on workflow adoption. iTrent was adopted without any facilitation or hindrance caused by the organizational structure and he reported:

Ref.50 "Usually we have our own budgets so we are not affected by the organizational structure in terms of IT adoption. So it's more flexible

On the other hand a policy manager explained his views on the degree of influence organizational structure has over decision in LGA_B by reporting:

Ref.51 "... there is an organizational structure but you know majority of times, as long as you get the feedback from the actual end users, the employees themselves and you've consulted top management within that, I think that's more or less done. The last thing you want do is going through each different layers and I believe that organizational structure plays somewhat role, but it's probably not going to play as important role.

iii. Information intensity

Information intensity is one of the major factors for organizations to adopt IT. It allows the processing, storing and exchange of large data with ease. These benefits of adopting IT have been acknowledged by LGA_B that sees information intensity as a major factor for iTrent adoption for HR and Payroll services. It was observed that the payroll department was collecting large information and most of the information was being processed with iTrent's assistance.

Analysis of the interviews conducted in LGA_B revealed information intensity as the influencing factor for the organisation to adopt iTrent in order to process information in an efficient and faster manner. The IT support manager elaborated on the use of iTrent for information processing by expressing his views as:

Ref.52 "I think iTrent has made things easier because the payroll service in LGA_B is not exactly overwhelmed with staff. So the more they can send out to the services for self-service and its repetition anyway, often people will do checking on paper and hand it out to someone else, same thing on and on which seems silly and if the system does it then it's got to be beneficial".

iv. Attitude

Attitude has been a major factor for IT adoption as mentioned in the most popular technology acceptance theories. However, the analysis of interviews conducted in LGA_B revealed that attitude does not have so much significance as it used to have in the past. The main reasons for attitude to lose its strength over decision making stood out as the current economic situation and extensive effective communication through various means.

Communication is a big factor in reducing resistance to technology and in changing the negative attitude of employees into a positive one. It was observed that people had a positive attitude towards using the technologies in the organisation to carry out routine tasks. Participants believed that showing the benefit attached to technology eliminates resistance and individuals are more ready to use the technology. The project manager described how they changed the attitude problem associated with iTrent users into productive gains. She reported:

Ref.53 "... but what we have done is we made sure that we discuss and communicate as much as possible. So from the beginning we've been involved with the unions you know making clear while we're on with them, we got councillors which is our sort of lead cabinet members. So obviously, keeping members involved and up to date with what's going on. And as I said we communicated through various means, we also tried to cross service for people who are positive about it, we asked them to be the champions, spread the message and liaise with people who are a bit cautious about going sort of more electronic. So we've done all of that".

Some participants believed that nowadays IT has percolated in different ways into our lives. We are bound to interact with technology more compared to people in the past. Hence, people are more comfortable with interacting with modern technologies and are less hesitant in using them. More awareness and greater comfort level reduces resistance towards IT. The IT support manager at LGA_B also highlighted how with the advent of technologies people have feared losing their jobs and hence, in turn, it has caused resistance to some minor level. He reported:

Ref.54 "The only thing it can be as an issue is that people in current economic climate are fearful of their jobs, so there is less resistance. But in the past, in local government, we were not quite so ready to say we are putting the system and that means we are going to lose jobs because usually you find other things for people to do because we always have more to do then people we have. I think now you might start to see a bit more because *people have made redundant and people are worried why is this coming along and what is that mean to me, am I going, you will get little bit of resistance".*

v. Stakeholders

Exploring for the organisational factors that affect the decision to adopt workflow technology, stakeholders were mentioned as an important factor. The analysis of the interviews and documents (iTrent business case, iTrent Project Initiation document) revealed stakeholders as an important factor in decision-making. Technology's impact on stakeholders and their interests were considered during the evaluation of the iTrent project.

Greater emphasis was laid on involving members of corporate services, senior management, users and external groups in the iTrent adoption and implementation process. Participants believed it was important to involve such groups to hear their views, evaluate the impact on them and predict future benefits. A project manager mentioned some of the stakeholders involved in iTrent adoption and she reported:

Ref.55 "... generally they tend to get a group together and that group would be HR, Payroll, IT and a couple of users you know the people who are out in the departments. So we need to make sure they are on board as well. And they are part of project team as well. Apart from the form of project team we have sub groups as well that we set up to deal with the different phases of the project. And there are more involvements again in there from the users, external parties and then we hold monthly meetings that we call dip logs, who are key departmental people who deal with HR and Payroll or within their own services. So they definitely need to be involved and signed up to it".

vi. Cost

Findings from the interviews conducted in LGA_B revealed cost as a major factor for workflow technology adoption. Participants believed in adopting IT to reduce cost and increase savings. Cost is a big decisive factor for IT adoption in LGAs. Business case document for iTrent mentions cost analysis to help in the decision-making process. The policy manager also emphasised the importance of cost factors in decision making; he reported:

Ref.56 "First to see how it will benefits the process, is it time saving, reducing cost, are we gaining process efficiencies, is it generating the information we need that will ultimately help us in making decisions. If it's very, very, expensive we won't be able to purchase that, we have a budget like any government organizations. So budget is important".

5.4.6.3 Environment

Investigating environmental factors affecting adoption of workflow technology revealed government regulation and imitative pressure as among the major factors to influence the decision to adopt. Competition, however, did not have any significant influence on LGA_B when they considered workflow adoption.

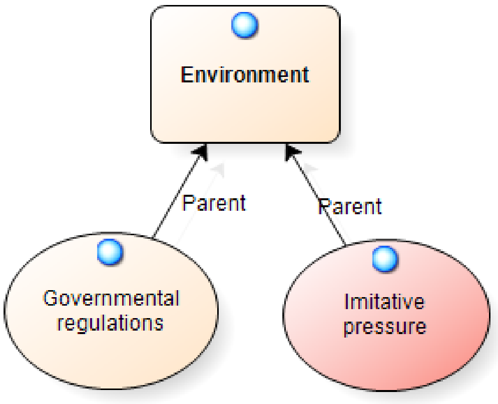

Figure 5.10: Environment factors LGA_B

i. Competition

The findings from the data collected from LGA_B showed that competition did not exist on the departmental level of the organisation. Participants did not perceive themselves to be competing with other organisations' departments at service level. Competition might exist for the overall organisational performance but it did not affect the decision for IT adoption.

Observations collected during the interviews showed that participants in LGA_B demonstrated least interest in competition and disregarded it as not applicable to their context. When a policy manager was asked to comment on competition as an environmental factor he commented:

Ref.57 "No, I don't believe there's any competition among us, really. We don't see us competing in regards to what other council is doing or not necessarily in regards".

ii. Government regulations

Analysis revealed government regulations have influence on the decisions of LGA_B to adopt IT. Government influence on LGAs is mostly through budget cuts or increases that ultimately affect the buying power of LGAs.

Government influences LGAs through legislation such as a requirement of transparency, going green, influencing through funding etc. Sometimes IT is purchased due to government funding and LGAs do not want it to be reduced, hence spending is made compulsory. Other times, cuts in budget allocation to the LGA can act as a hindrance to the adoption of IT. Pay to purchase is an automated purchase system which the Welsh government mandated all the LGAs in Wales to have instead of the traditional method, buy to purchase. The policy manager expressed his view on government regulations' influence on decisions to adopt IT and he suggested:

Ref.58 "I believe any decision that the government takes probably would impact the council. You know, in regards to budget cuts. So maybe we want to adopt top of the range new technology, but if you have a large budget cut then obviously that's not going to happen. The national government comes out with a number of policies that affects us in number of ways. And yes of course, everything that the government does, probably will somehow affect the council.

iii. Imitative pressure

One new factor emerged during the analysis of the interviews conducted with the participants at LGA_B. Imitative pressure that influences decision making from the other LGAs was seen as a new environmental factor. One of the factors to influence the adoption of iTrent in LGA_B was the success story of other councils. For LGA_B, it seemed a natural progression to move from version 6 to iTrent and to be on similar systems for future collaboration. Participants reported that there was a regular dialogue taking place between the LGA_B and the neighbouring authorities regarding IT adoption. A project manager expressed her view on being influenced by other LGAs for decision-making support as:

Ref.59 "... yes, I wasn't involved in the original version 6, it's the old version, but I believe we're one of the first authorities that went in ... to some extent they hit all the problem snacks, because they were the first. So this time the local authority definitely stood back and waited for the other authorities to go on to iTrent, let's see how it performs for them and then if they were happy then we tried and tested it. Lots of good reviews came and then they said yes".

5.4.6.4 Task Technology Fit

Participants at LGA_B perceived that the fit between the technology and the task requirements as an important factor for IT to be adopted as shown in figure 35. iTrent was adopted after analysing how well it would serve the task purpose and hence fit played an important role in the decision making process.

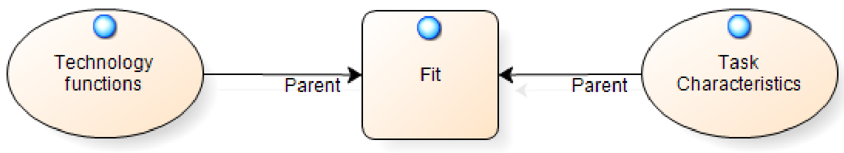

Figure 5.11: Task Technology Fit LGA_B

Technologies are adopted to achieve process efficiency, save costs and gain benefits, however, before all these relative advantages can be gained, it is important to rate technology's functional capabilities against the task activities involved. A project manager for iTrent revealed that it was adopted after analysing it for task technology fit, she reported:

Ref.60 "We saw how it can better meet the requirements of the services because if it can't deliver any better than without it, then you don't need to spend a lot of money and implement the system. So it's about how it will serve the service process requirement".

5.4.6.5 Task characteristics

On investigating task characteristics in LGA_B it was discovered that in both the policy making and the human resource departments four major characteristics of tasks exist. These were generation, choice, combination and collection as shown in figure 36, for tasks in policy making and HR/Payroll.

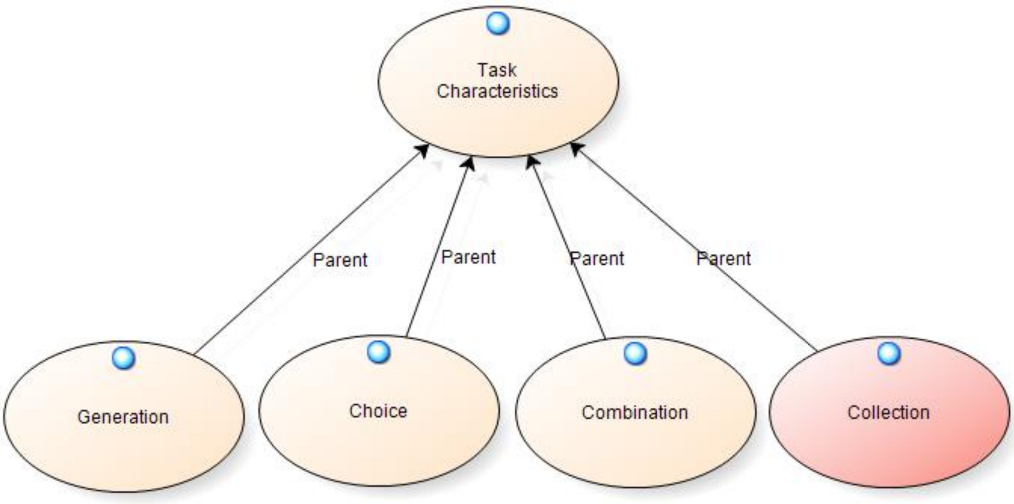

Figure 5.12: Task characteristics LGA_B

i. Generation

Analysis of the empirical data collected from LGA_B revealed generation as one of the major task characteristics in the organisation. A generation task requires an individual to generate ideas or alternatives.

During the analysis of the interviews it was revealed that members of staff from different departments generate information in various forms. Such information is about absence from work, holiday requests, travel claim etc., which are used by the HR and payroll department for preparing reports and finances. The payroll manager presented his view on the iTrent system to allow the generation of information from within and outside the LGA. He reported:

Ref.61 "... its convenient for the staff members to type in the details of their millage claims, holiday request or anything similar to that, while sitting in their departments. It also reduces unnecessary paper work going around the building".

The business case report also revealed adopting iTrent for generating e-payslips, e-recruitment and self-services for expense administration. Such functions allow users to generate information that is required by certain processes.

Interviewing a policy manager revealed that the consultation stage takes place before a decision on policies is made. In this way, the citizens and the affected parties generate ideas and alternatives, which are collected by the policy making team to use in the decision task. He reported:

Ref.62 "Majority of the decisions before they are made, I mean there's always the consultation, so residents are involved in the consultation. Residents are informed of any new policy being implemented, obviously before policies are implemented we always notify the residents".

ii. Choice

All the participants identified a second major characteristic of task as decision-making and selecting options. Most of the task in the LGA_B is about taking decisions on policies, concepts, budgets, approvals for staff requests etc. Findings from the interviews showed there were many tasks involving decision-making representing choice characteristics in the LGA_B and from the department of payroll, the payroll manager reported:

Ref.63 "… like any service in the council, in payroll too, we have to make important and calculate decisions. For instance, when staff request for a holiday through iTrent, it's not that we will respond to it by authorising it just like that, it's more about looking at the circumstances of the service department if its ok to authorise and also considering the request put forward by the individual. So decisions are made after proper consideration".

The policy making process also includes a task of decision making, selecting from various policy ideas produced by the member of the council and residents through consultations. The policy manager elaborated on policy formulation by reporting:

Ref.64 "… in terms of any new initiative or any new idea, it comes from the council. Projects in the council comes from variety of sources, anybody could have a good idea so if it's a good idea and if it's going to be helpful, we will discuss that and will make a decision to whether or not to implement the decision".

iii. Combination

Some tasks in LGA_B have activities that require generating ideas and making a decision by selecting from given options. Such a task is characterised as combination and such instances appear in the policy making and corporate services of LGAs.

Analysis of the interviews conducted in LGA_B revealed that in every department ideas are being generated and decision makers are making decisions by considering the ideas. For instance the payroll manager expressed that in the HR department many decisions are based on collection of information, generating options and making decisions, he reported:

Ref.65 "…If there is a new starter for instance then the employee department will put the employee information on iTrent in HR system within the recruitment part of it that generates a letter in form of an advert in the paper or job centre. They then record all the people who come in who have applied for that job and they then go for the interview process via HR and then finally pull on to the system with Pay details and final commons points as we used to identify how the person should be paid per hours and we attach them to payroll run and this is all created by workflow now"

Similar instances of the combination characteristic prevail in the policy and planning department where policies are formed by collecting the opinions of citizens, filtering them and using the information for informed decisions. The manager of the policy and planning department at LGA_B explained:

Ref.66 " In other words, if the residents get a petition signed up, sometimes residents can request certain things, so if it hits a certain amount of figures it can actually be brought into full council to be debated by them and to take a decision".

iv. Collection

Findings from the data collected at LGA_B showed that there is large amount of data, which is collected and processed in both policy making processes and corporate processes. Such activities where information is collected from internal employees or external customers show collection as a task characteristic.

Various means of information collection was seen in the organisation in different departments. Information flow is high due to the information intensive nature of the organization as LGA_B is public service provider, hence recording information, collecting information from various areas and storing it requires IT help. The payroll manager explained the use of iTrent to facilitate the flow of information and he reported:

Ref.67 "Citizens can apply for jobs using our e-recruitment service, which is supported by iTrent, and at the HR end all the information provided by the candidate is received and after that they decide to invite the candidate for any preliminary interview".

The majority of information flows are from residents and partner groups (police, fire rescue, neighbouring councils etc.) that populate LGA_B's database. Consultations take place on a regular basis and collecting residents' feedback and opinions are vital for effective policy making. The policy manager at LGA_B explained:

Ref.68 "We have got a data base that holds all the consultations from the general public. Database is populated and we know consultations have happened between the residents and the council. Sometimes we will just target proportion of the citizen and we won't target everybody depends on what we are trying to find out. That database is then used to help us informed decision-making".

5.4.6.6 Technology functional support

The technology function refers to the features of the IT adopted by the LGA_B to serve task purposes. Analysis of the data revealed that there are three functional features of iTrent that help members of the LGA_B to carry out tasks efficiently. These are communication support, information processing support and process structuring support which are explained further below:

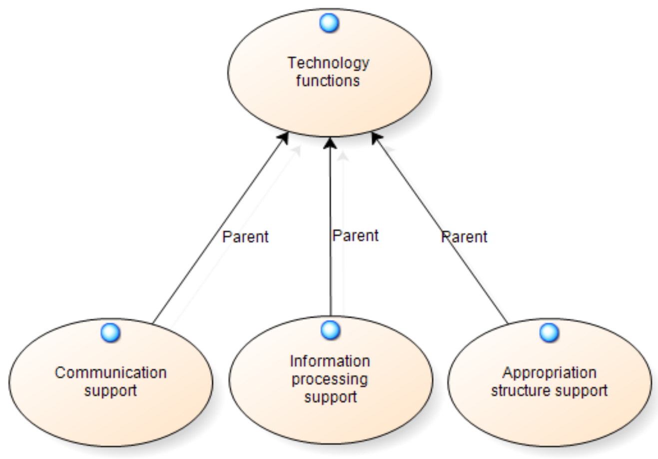

Figure 5.13: Technology functions LGA_B

i. Communication support

Communication is one of the vital functions of IT to enable users exchange information efficiently between the departments within and outside the LGA_B. Findings from the data also revealed the importance of communication support for daily tasks accomplishment.

Communication support allows the sharing of information between individuals or departments and access to information for collaborative tasks. Participants perceived iTrent to enable them to share information and work with its built in workflows that move information from one point to another and enable input from various locations on a similar task. The IT head reported:

Ref.69 "So it helps people in booking leaves in rather than having to take a card to my boss, I can just fill it online, once he approves HR is notified and hence payroll gets information on how many days I will be on leave and so on. So it's sleeker and quicker and collaboration is faster".

Participants believed collaboration is an important element for productive output and time saving by allowing richer information processing from multiple sites. The payroll manager who explained a similar opinion, reported:

Ref.70 "… there is a lot of collaboration even more now since we have implemented iTrent. A time sheet, if an employee does claim overtime pay, its sent to their managers *and managers send it to us we then check details and apply the correct rate depending on the type of employee is and enter into the payroll system obviously that has been calculated and there is correct pay to employee at the right time".*

ii. Information processing support

Information processing is an important function for an organization rich with information flow. Data collected from LGA_B revealed huge amount of information is gathered, stored and processed to deliver services to the residents.

Workflow technology is optimally utilised when information processing is required and efficient use of information for decision-making. Findings from the empirical data revealed LGA_B is an information intensive organisation and a large quantity of information is processed manually and with the help of IT regularly. With over 6000 employees in LGA_B, processing information relating to employees' demands for efficient IT such as iTrent for the HR and payroll departments. Similarly, in the policy formation department there is an influx of information from the consultations and research carried out for informed policy making. The policy manager expressed his view on the gap of not having IT support for processing information in the policy department and he reported:

Ref.71 "We collect a lot of information from citizens and we use that to inform a lot of other things we do, so yes, we use feedback quite a lot. So something that can process information, store it and direct it to right person or department would be good and something that allow service members to collaborate on same policy formulation would be good".

iii. Process structure support

Process structure support was found to be one of the workflow technology functions in iTrent. The findings from LGA_B on iTrent revealed that the technology not only helps in communication and information processing but also supports process structuring with its in built workflows.

iTrent helps in routing tasks to the right person by qualifying through the roles defined in the conditions that are attached to the workflow definitions. Such conditions direct the next step for the system to process and authorise users to work on a task. The IT head at LGA_B explained the use of iTrent as the most efficient mechanism in the council for process structuring. It authorises users to access information, which helps in monitoring and controls flow of information to the relevant employees. He explained the role resolution ability of iTrent with an example:

Ref.72 "… so it's sleeker and quicker and collaborations are faster. Also if my boss is not around it will route it to second person who is authorised to approve leaves, so it saves time and makes things faster".

From the policy making perspective the manager expressed his desire to have a technology that will allow qualifying residents to participate in consultations automatically, process information and structure the policy making process. He reported:

Ref.73 "… we have got a data base that holds all the consultations with the general public that data base is populated and we know consultations have happened between the residents and the council. Sometimes we will just target proportion of the citizen and we won't target everybody, depends on what we are trying to find out. That database is then used to help us informed decision-making".

5.4.6.7 Summarising the findings from empirical data LGA_B

Investigating factors influencing the adoption of workflow technology in LGA_B revealed that most of the factors selected from the literature were observed in practice, some did not exist to a level to cause any significant impact and some factors emerged from the empirical data. Participants perceived relative advantage, cost and task technology fit as the most important factors of all. Analysis of the findings relating to technology factors revealed complexity, compatibility and relative advantage as important factors to influence workflow adoption in LGA_B. Empirical data also highlighted that participants perceived time as a valuable resource of the organisation and its optimal utilisation and minimising its loss is given utmost priority. Timescale can incur cost, loss of time, underutilised resources and delays if not considered properly during the adoption of IT. Hence, timescale is a technological actor influencing decisions to adopt workflow technology. Exploring organisational factors in LGA_B confirmed managerial support and information intensity as influential factors for workflow technology. The data did not confirm organisational structure to be an influential factor as LGAs have a high level of managerial support that aids impetus to decisions due to their decision making authority and secondly, individual departments are allocated their own budgets which increase autonomy in those departments. Attitude was another factor that was not confirmed as one of the organisational influential factors category due to the current economic climate that has created a scarcity of jobs and redundancies have pushed employees to work harder and take more responsibility. Participants in LGA_B also perceived that enough training and effectively communicating the importance of the new technology fades out negative attitudes and motivates employees to adopt new IT. One new factor emerged from the empirical data collected from LGA_B which suggested involving people in decision-making whose interest might be affected by IT adoption. These are the people who are influenced by the adoption of IT (users) and who can influence the decision to adopt IT (corporate management). Stakeholders were involved for iTrent adoption for effective decision making in LGA_B. Investigation of environmental factors revealed that government regulations influence decisions to adopt IT through funding which increases the purchasing power of the LGA and cuts can impede procurement of IT. However, competition did not come out as an influencing factor. Participants in LGA_B believe competition might exist for the overall organisation but does not exist at departmental level to influence decisions. On the other hand, imitative pressure exists as an environmental factor to influence decisions in LGA_B. The decision to adopt iTrent was also influenced by a neighbouring LGA who were using iTrent and gaining benefits from it. Regular communication between the LGAs also creates imitative pressure on an LGA’s decision to adopt IT. Further analysis confirms the influence of task technology factors in LGA_B and an additional factor emerged for task which is the collection characteristic. Being an information intensive organisation in nature, LGA_B’s public policy department and services are bombarded with information which is collected and recorded for information processing. Hence, the collection task exists at various levels in LGA_B and participants perceived it to be an important and the most frequent task in the organisation. Table 5.6, summarises the empirical findings from LGA_B that shows factors that were confirmed and rejected through the findings.

No.	Factors		Interviews	Documents	Observations	Confirmed	Emerged
1.	Technology	Relative advantage	Ref.42,	✓		✓	
2.		Complexity	Ref.43, 44	✓	✓	✓	
3.		Compatibility	Ref.45, 46	✓		✓	
4.		Timescale	Ref.47	✓			✓
5.	Organization	Managerial support	Ref.48			✓	
6.		Organizational structure	Ref.49, 50			X	
7.		Attitude	Ref.52, 53		✓	X	
8.		Cost	Ref.55	✓		✓	
9.		Information intensity	Ref.51		✓	✓	
10.		Stakeholders	Ref.54	✓			✓
11.	Environment	Competition	Ref.56		✓	X	
12.		Government regulations	Ref.57			✓	
13.		Imitative pressure	Ref.58				✓
14.	TTF	Fit	Ref.59			✓	
15.	Task	Generation	Ref.60, 61	✓		✓	
16.		Choice	Ref.62, 63			✓	
17.		Combination	Ref.64, 65			✓	
18.		Collection	Ref.66, 67		✓		✓
19.	Function	Communication support	Ref.68, 69			✓	
20.		Information processing	Ref.68			✓	
21.		Process structuring	Ref.69, 70			✓	

Table 5.6: Summary of Findings from LGA_B

5.4.7 Background to LGA_C

LGA_C is a public organisation operating as a unitary council in the south east England region of the United Kingdom with a population of 140,200 with census 2011. The organisation has approximately 1440 staff members on its payroll, working in wide range of services, catering to the needs of residents. These services include planning and building control, housing, school and learning, roads and streets, business etc. Residents of the council can make their inquiries through telephone contact, walk-ins and via a web site and the council deals with over 120 inquiries per day with some peaks and drops in inquiries. LGA_C provides a different means for consultations such as through public meetings, the web and mails. The council believes in strong governance and using ICT help to provide better services and to serve the needs of the residents optimally.

To investigate the factor proposed by the conceptual model and explore for emerging factors from the fieldwork 5 participants from the organisation were interview as shown in table 5.7. The participants fulfil the requirements of the analysis as mentioned in chapter 4 by participants being selected from three main categories (policy, IT and user). Apart from collecting opinions and views of the participants through interviews and documents, observations have been taken into consideration for robust analysis. The website of the LGA_C was also used to find additional evidence and information.

	Category	**Job title**	**Number of participants**
LGA_C	Policy makers	Policy manager	2
	IT	IT manager Project manager	1 1
	User	Admissions and transport manager	1
	Total		5

Table 5.7: Participants from LGA_C

5.4.8 Application of workflow technology in LGA_C

LGA_C is committed to providing local residents with a range of high quality services, ease of access to information and transparency. The ICT strategy of LGA_C is aligned with Government ICT strategy for stronger governance and maintaining the standards expected by the government and the residents (ICT strategy, 2012-2015). The ICT strategy adopted by the LGA_C is based on five principles that state simple, consistent, secure and reliable processes with ease of access and fit for purpose services. In LGA_C workflow technology is adopted through EDMS, PARIS SYSTEMS, SharePoint, Education and Transfers module and transport module technologies.

The admissions and transfers module is a workflow based technology that allows users to allocated school admissions and transfers with ease which can be quite challenging during annual admissions when over 6000 applications are required to be processed. With its built in workflows it allows automatic school allocations according to a set of preferences by the applicants and which works according to LGA’s policies. It increases the admissions process efficiency, compliance with government regulations and greater accuracy. One of the reasons to adopt the admissions and transfers module was that the older version was not capable of meeting the functions of the admissions team efficiently and it was not user friendly. Also the software required an update and the technical support for the technology was terminated (Report of Strategic Director for Children Services, 2011). When the project manager was asked to comment on the motivation behind the adoption of the Admissions and Transfer module, she reported:

"The system we had was not updated version and it did not serve well to admissions functional needs. We were looking to have online application process that will help the residents and the staff to perform admissions procedure. This on line application process is supported by the provision within the new update version of the software module"

Nonetheless, advances in technology can be seen in the service department of LGA_C and not the policy making department. Not much effort has been reported by the participants nor documents collected from the organisation that would suggest IT adoption for policy making processes. However, a keen desire has been shown by the participants for workflow technology support for policy formulation, if there exists any such solution in the market.

5.4.9 Contextual and functional level factors for workflow technology adoption

Investigating LGA_C for contextual and functional factors of workflow technology adoption necessitated exploring factors from technology, organisation, environment and task technology fit perspectives. Multiple methods for collecting data have been adopted to gather rich information relating to the factors for analysis. Further discussions and evidence have been presented below to support the respective statements.

5.4.9.1 Technology factor

Analysis of the data collected from LGA_C confirmed relative advantage, compatibility, complexity and timescale as an emergent factor from the data as technological factors that influence decisions to adopt workflow technology. These factors are exhibited in the figure 38 below and discussed further in the following sections.

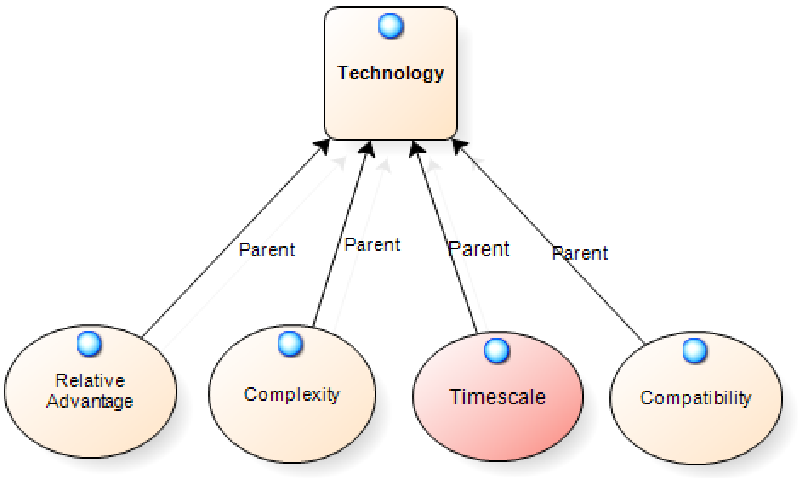

Figure 5.14: Technology factors LGA_C

i. Relative advantage

Findings from LGA_C revealed that relative advantage is seen through benefits and process efficiency. Participants in LGA_C expressed their opinion on relative advantage as an important deciding factor for workflow technology adoption. Benefits and process efficiency promotes relative advantage of workflow technology which positively affects decisions to adopt.

The head of IT, a policy manager and an admissions officer were asked to comment and illustrate the important factors affecting the decision to adopt workflow technology. The interviewees agreed on benefits and process efficiency to be vital contributors to adoption. For example the policy manager explained that the benefits were the deciding factor and a relative advantage over the existing system. He reported:

Ref.74 "… if technology works we're willing to adopt it but it depends on the benefits, so like again with the HR service which is a self-serving service which we're just starting that will really help us and then we'll take the pressure of the line managers and things like that".

ICT strategy 2012-2015 report suggested the adoption of IT to increase savings by improving public sector productivity and efficiency. Similarly, the IT head explained the importance of efficiency for a technology to be adopted in LGA_C. He explained how efficiency has become important with the decrease in funding from the government and he elaborated on this significance as:

Ref.75 "… at the moment they are tight on the budget and council is getting less money as they used to before so their spending on IT department is low but they want to use ICT to reduce overall cost and gain process efficiency at the same time. So I believe, adopting right ICT can save cost and reduce workload and improve efficiency if adopted correctly, ICT should improve performance and save cost".

ii. Complexity

At LGA_C participants perceived complexity of a technology through how much command they could have optimally over using the technology. IT training was linked to a measure of the degree of complexity of using a technology. Hence, the IT training requirement defines the complexity of a technology for participants and affects their adoption decisions.

While investigating factors of adoption in LGA_C, it was observed that participants demonstrated desire to adopt technologies that are user friendly and the project manager for the Admissions and Transport system explained:

Ref.76 "So certainly cost of training employees for the new system and how much skills are required are important factors to be taken into account when making decisions on IT deployment. Like climb house publisher, which is something where we could set tasks we can say actually for this document that we're producing I need info from finance to do, for this I need info from planning. It was really difficult nobody wanted to use it".

The findings confirmed the impact of complexity on decisions to adopt workflow technology and that the more complex a technology is perceived to be by the adopters the less are the chances of its adoption.

iii. Compatibility

Analysing the compatibility factor of workflow technology there was a general agreement between the participants that compatibility significantly affected the decision to adopt. Participants associated compatibility with the ability to integrate with existing systems in

LGA_C and are able to update it with current market versions. Another interesting factor that was found to be the supplier's influence that can act as a monopoly in the market for LGAs and persuade them to adopt technologies that is compatible with their products.

Maintenance and integration with existing system were two elements dictating compatibility of technology in LGA_B. For example the policy manager explained due to cost and lack of funds LGA_C is looking to invest in technology that will incur a one-time cost with a long period of usability, he explained:

Ref.77 "… how it's going to integrate with the existing system and in the future proofing of it. If it's going to be upgraded every year or it's something that's going to have shorter life then we need to seriously think before we can invest in it".

Analysis of the documents (ICT strategy 2012-2015) highlighted significant failings in government ICT and among the listed causes was lack of interoperability. When the project manager at LGA_C was asked to comment on compatibility of workflow technology he explained how sometimes LGAs are bound to adopt technologies that are compatible with their supplier's products in the organization. To elaborate further he explained through an example:

Ref.78 "Larger scanner systems was replaced with higher mapping solutions that worked with the capita, we went out to the market place and bought that. Because we are Capita authority and they have got a higher mapping solution to move over that, scanner seized to be maintained".

iv. Timescale

Investigating the technological factors in LGA_C revealed timescale as an important element that can influence adoption of workflow technology. It is the time period when a technology can be implemented and the time it takes to provide productive use of the technology. Participants perceived timescale to be a technological factor that impacts decisions to adopt a technology.

Participants from the IT department in LGA_C commented on the significance of the time it takes to roll out a new system. They explained that if a technology is implemented throughout the organization it needs planning, scheduling and roll out piecemeal rather than all at once. Further the project manager elaborated on the adoption of technology with an example suggesting adoption should take place when the time is right for the technology. She reported:

Ref.79 "… for instance we are using older version of admissions and transport system, so we can do year in admissions. But would we want to adopt new version at this time, no. Because yesterday was an offer day for primary school, so, 7,200 odd letters were sent out on that day. There were 700 odd calls about primary admissions yesterday, so is that the day we would choose no. Would we do it three weeks before, no. The letters take about two three weeks to pack. So, when we would do and answer is you do it some months previous so you can actually use it for the process. There will be key points milestones when you can introduce that. And if you can't get it in place till then, you use the earlier one".

5.4.9.2 Organisation

Analysis of the data collected from LGA_C revealed managerial support, information intensity, stakeholders and cost as important organisational factors that influence the decision to adopt workflow technology. However, organisational structure and attitude were not confirmed to be one of the important organizational factors in LGA_C.

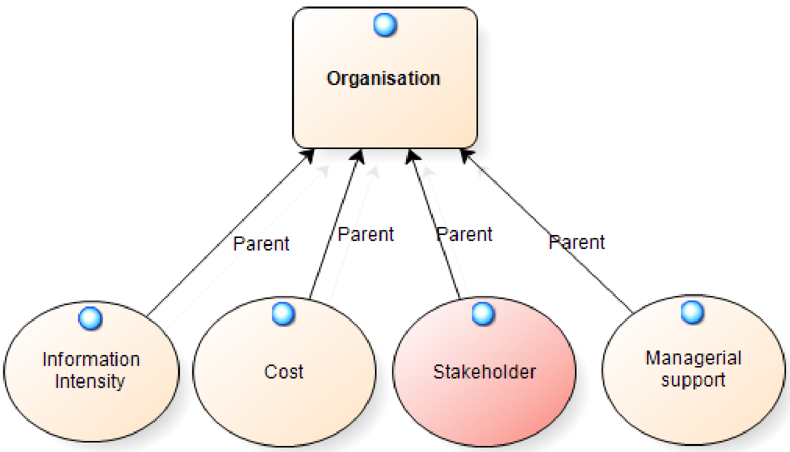

Figure 5.15: Organisation factors LGA_C

i. Managerial support

Managerial support plays an important role as an organizational factor to influence workflow technology adoption. Results from the data collected from LGA_C suggest managerial support is influential in rolling out technology faster and as an important organizational factor that influence decisions to adopt workflow technology.

Managerial support is significant in the timely adoption of IT and it is not involved in the decision making only but also in persuading staff to utilise the new systems. The IT head at LGA_C explained the same phenomenon and elaborated on how IT adoption is made quicker when staff is involved. Reducing the burden on the staff in daily tasks and communicating the benefits of using the prospective technology can facilitate the IT adoption process. He presented an example to elaborate on the significance of managerial support as an important organisational factor for IT adoption, he reported:

Ref.80 "To be fair to the services they have got really busy job, if it's the environmental services, they are doing the bins and they are under lot of pressure to deliver the service. Then we simply say we have got this new HR system for you and we want you to use that instead and they are busy with the public call all day. If their top boss or head of services is not supportive of the new system and telling them to still answer the calls now. You know they won't just take it up, so it's key to get them on the new system. Here in this system that has always a problem. So if the head of the system ask them to make sure they use the new system and manage to maintain a fair number of calls at the same time so it will be adopted faster".

ii. Organization structure

Analysing organisational structure as an organisational factor to effect the decision to adopt workflow technology in LGA_C showed minimal impact. Participants perceived the main reason behind it is that each service in LGA_C is allocated with their budgets and due to high managerial support the organisational structure creates no hindrance for workflow technology to be adopted in LGA_C. The organizational structure resulted as an insignificant factor of the organisational factor to influence decisions to adopt workflow technology in LGA_C.

The project manager at LGA_C explained inflexibility in organisational structures used to create delays in the past, however, with progress of time, organisations are becoming more flexible to enable efficient flows of information and decision-making. She reported:

Ref.81 "… culturally organization, I think has changed and moved on from rigid structures into self-sufficient departments and we have to accept that you know there are systems out there which are going to make our life easier and that is what we aim to communicate to our employees …".

iii. Information intensity

LGA_C was observed to be highly information intensive also due to the fact it is a public service provider. Participants believe the higher the degree of information processing in the organisation the more IT is needed to effectively and efficiently process that information.

When a policy manager was asked to comment on what factors in her opinion influence IT adoption, it was revealed that not only the service departments seek IT help for processing large information but for policy formulation too, IT can be beneficial. Further to explain this significance the policy manager commented:

Ref.82 "… I said about deprivation and sometimes I am looking at large complex data and doing it in excel takes forever and but if I have that kind of software available then it will be much quicker. And also it just looks a bit nicer and you can present it, it just saves time, it's more efficient so sometimes yeah I would on a personal level like to have some kind of software available".

The intensity of information flow necessitates IT adoption and the admissions department collects and processes large information on a regular basis. An admission and transport manager explained the significance of adopting Admissions Module technology for processing admissions through an example and he commented:

Ref.83 "We have a year group assigning this year so about 7000, 8000 coming now. So it's a lot and there are 11 people in the admissions team. So all the admission will go through those 11 people. There would be no way all those admissions can be done without the help of ICT".

Participants believed that to reduce workload and increase efficiency in processing information, IT is adopted and hence information intensity plays an important role as an organisational factor which influences the decision to adopt IT in LGA_C.

iv. Attitude

Employees' attitude is depicted in their positive or negative behaviour towards the change in the organisation. Participants perceived resistance to adopting IT as a negative behaviour and it is reduced by perception of benefits and effective communication by the management.

When the admissions and transport manager was asked to comment on attitude towards new IT, he explained that changes are bound to occur and people are expected to adapt to change. He further explained:

Ref.84 "This is a working environment not a social platform. So people might be resistant to change but tough luck they are going to accept it. We don't actually have to win people's approval we support them by talking about it. If you are working in the area I'm in, there are changes all the time and it depends on the benefits of ICT and we have to go with that particular flow".

It was also observed while exploring for organisational factors in LGA_C that employees' ease and comfort in using technologies also signified that they were well trained and had a positive attitude towards IT utilisation.

v. Stakeholders

Investigating for organisational factors that influence the decision to adopt IT in LGA_C it was found that participants perceived stakeholders to be an influential element for IT adoption. Stakeholders emerged as an organisational factor influencing the decision to adopt IT in LGA_C.

Participants perceived stakeholders as anyone who is affected or will be affected by adopting IT. A policy manager, an IT manager and an admissions manager agreed mutually on the role of stakeholders and explained that stakeholders are involved when making decisions and they can facilitate the decision-making process leading to faster adoption. The IT manager at LGA_C explained how affected entities are involved when adopting IT by commenting:

Ref.85 "In a perfect world, a service manager initiates the requirement for a system. Then they contact IT department to discuss possible implementations. So basically the solution or potential ICT solution comes from the service itself, when they feel there's a need to reduce workload, cost or improve processes, which then involves IT department. If the project is on large scale then higher management is involved for endorsement. Usually for smaller projects it can be endorsed by the head of the departments, so anyone being affected by it will be involved".

vi. Cost

Due to budget constraints cost is the most important organizational factor to influence IT adoption. Data analysis revealed that cost is considered as a primary decision making factor for adopting IT by all the participants in LGA_C. When a project manager was asked to comment on the most important organisational factor to influence IT adoption, she said:

Ref.86 "There will always be a budget constraint, I mean if you look at the market for products like workflow based, our corporate governance group would ask us to find out what is around to help with the monitoring policy, updating and communication of it to people. We had someone who wanted to charge, I don't know the name, it was like £40,000 and it was ridiculous for something that you could, if you really need to do, on excel and spread sheets, this is a lot of money and I think we don't have a lot of money as an authority".

Analysis of the documents (business case, LGA_C constitution report, ICT strategy 2012-2015) also highlighted cost as a major influential factor for IT adoption. Documents suggest IT is adopted with evaluation on the lines of cost benefit analysis and budget constraints which increases the significant role of cost as an organisational factor for IT adoption. Similarly, an IT manager expressed his view by acknowledging cost as the major deciding factor for IT adoption by reporting:

Ref.87 "In all cases we would expect a business case to be prepared but that would be for any system, any ICT. Depending on the scale of IT cost will be broken down to see what sort of efficiencies will be delivered, what benefits will be achieved, so it's more like cost benefit analysis".

5.4.9.3 Environment

On investigating environmental factors for workflow technology adoption in LGA_C, the findings confirmed government regulations as an important environmental factor and competition does not significantly exist to influence the decisions to adopt IT. Moreover, imitative pressure emerged as a new factor from the data collected from LGA_C as shown in figure 40

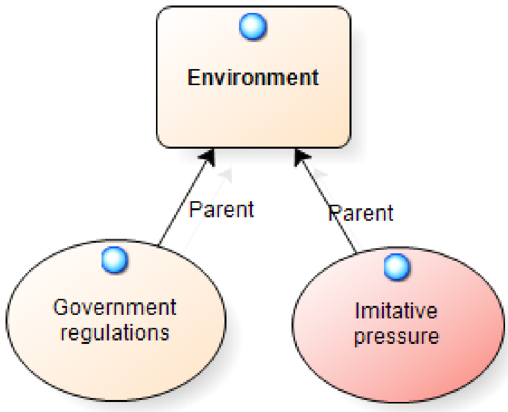

Figure 5.16: Environment factors LGA_C

i. Competition

Findings suggest competition does not play an important role in affecting decisions to adopt IT. LGA_C is a public organisation, which does not compete to provide services to residents. IT is adopted to reduce workload, achieve efficiency, benefits and deliver quality services.

When asked to comment on environmental factors impacting decisions to adopt workflow technology, participants commonly agreed that services are not competing with other LGAs and competition has no influence on IT adoption. Their body language suggested they did not feel competition to exist in the context importantly enough to be discussed in detail. IT is adopted to improve service output and LGAs are responsible for services within their own principle areas, hence competition does not exist in providing services. Nonetheless, competition might exist among the LGAs as an overall public organisation within a county but that does not affect directly decisions to adopt IT for service delivery. A policy manager expressed his view when asked to comment on environmental factors influencing the decision to adopt workflow technology. He commented:

Ref.88 "… it's not a competitive pressure. And as a unitary council we do work in partnership with the local authorities, we would not compete and make decisions considering what's important for us only".

ii. Government regulations

Findings from the data collected revealed government regulations as an influential environmental factor for workflow technology adoption in LGA_C. IT adoption is influenced by government promotions to increase e-government and extending funds for implementations.

Government does not have a direct influence on decisions being taken in LGAs, however, documents (council constitution, ICT strategy 2012-2015) suggest it has a great deal of influence through funding, government ICT strategies and government technical standards for LGAs. An admissions and transport manager explained how government influenced the adoption of Admissions and Transport technology in LGA_C by commenting:

Ref.89 "The government pushed this online admissions policy and huge amount of money was spent to implement the online admissions process. It essentially makes it easy for the residents to use it and for us to use raw data".

iii. Imitative pressure

During the investigation of environmental factors influencing decisions to adopt workflow technology it was revealed that imitative pressure exists which influence the adoption of IT in LGA_C.

Participants perceived imitative pressure to exist in LGAs however decisions to adopt IT are not solely based on what other councils possess. What works for others may or may not work for them but LGA_C does consider finding out how a certain process is carried out best using IT among other LGAs. As there exists no competition, sharing such information is common among the LGAs for improving service deliveries and achieving process efficiencies. A policy manager expressed his view as following others' footsteps to gain benefits yet keeping under consideration the organisation's own policies and what works for it. He reported further to elaborate on imitative pressure as:

Ref.90 "… we would consider if neighbouring council has got a better way of doing business and they are Capita authority as mostly systems are with Capita systems and then we may adopt their approach if it looks like it's a better one. But then if everyone is using version 3 then the questions that come to mind are why they are still sticking to version 3, why they are doing that. They don't have a mapping solution and how they will do business. Some authorities do not have what we have got. They don't have the activated footpaths and network, which means they will spend more money because they will not be able to do those functions accurately about home school transports".

5.4.9.4 *Task Technology Fit*

The findings revealed that participants perceived a technology to be useful and would adopt it if they can see that the technology functions are able to best serve task requirements.

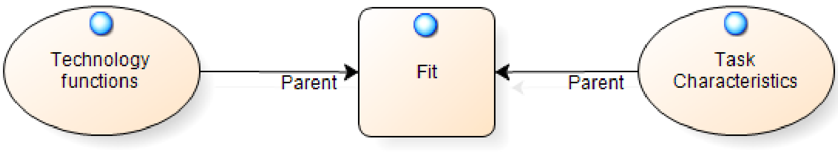

Figure 5.17: Task Technology Fit LGA_C

Analysing documents (ICT strategy 2012-2015, Report of strategic director for children services) revealed the importance of technology appropriateness to the task means creating value for money through its adoption. Participants agreed on fit between the technology function and task requirements as a deciding factor for technology to be adopted. The policy manager explained before adopting a technology among the important steps for procuring IT, which is fit for purpose, has to be checked. He elaborated with an example and reported:

Ref.91 "… the project team sets what we need a technology to do, these are going to be key functions, this is what IT must do and so we used that before we go around and look for what's in the market. So we got clear idea what we need and then it's up for the suppliers to say what actually you can have, all of that and some, it has to be matched and see what the technology function is doing, may be in the past we were cash rich and able to do that but not anymore. It's going be completely fit for purpose".

Task technology fit was found to be an important factor for workflow adoption as during the interview with the admissions and transport manager when he was asked to comment on fit between the technology functions and task requirements he commented:

Ref.92 "Well, I think technology would only be adopted if it is meeting task requirements optimally otherwise why implementing such a system. Considering the admissions and transportation service in the council, I think it's doing a great job. I would say it would have been impossible otherwise. So we are very happy with the results it produces. One of the reasons for the success of admission module technology is that it is better matching the everyday service related tasks. So yes, I think it's very important for any technology to be adopted it must be able to serve at best the work requirements".

5.4.9.5 Task characteristics

Data was collected from LGA_C to find out what major tasks exist in admissions and policy making departments and findings revealed generation, choice, combination and collection as major task characteristics, as shown in figure 5.18.

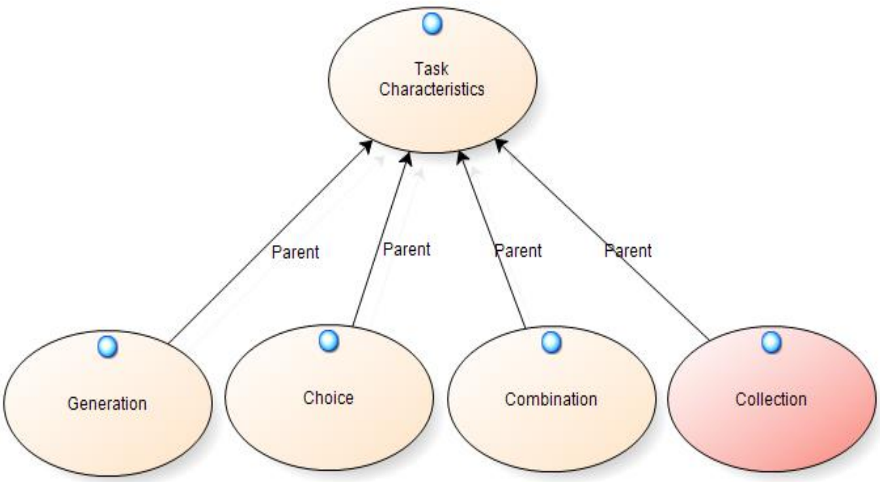

Figure 5.18: Task Characteristics LGA_C

i. Generation

The generation task characteristic was found to be commonly present in every department of LGA_C. Information is being generated as a result of a business process and participants are constantly involved in generating reports, data and information for different processes. Participants explained that for decision making, relating to policies for the residents, it necessitates having a pool of ideas and suggestions that are created by the department and residents through consultation for effective policy formulation. She further explained the scenario by presenting an example:

Ref.93 "If we think around something like planning policies that's probably where the public have more of involvement for example we are looking at our local plan which is really how we are going to use our land and where we are going to build houses up until 2031. We have a series of events for the public to come along, share and generate ideas that gets fed into our policy making".

An Admission and Transport manager provided a similar comment with regard to generation as a task characteristic. He noted:

Ref.94 "Admissions module system uses information provided by the parents and based on that information it sends out letters to the parents regards the options of schools they have for their children to go to. All this information is generated through admissions module technology and information is sent out automatically".

ii. Choice

The choice task refers to a decision-making or selection task that findings from the data collected in LGA_C have confirmed. Participants stated that among the routine tasks, making decisions and selecting from options are the most common task types they perform. Several participants explained how technology is helping them to organise vast amounts of information and making the right decisions using it. The policy manager responsible for admissions explained how large information provided by over 7000 applicants is analysed and decisions are made using the Admission module technology and assigning applicants with the right school admissions. Further, he explained by commenting with an example to elaborate on how decisions are made by reporting:

Ref.95 "Basically we need to have policies in place, it's about differentiating and assigning who can go where. So we have series of issues, as there are limited places and assignments are big. Just like hospitals and filling beds. If you fill every bed in the hospital all the time then there will be a problem for new patients. So there has to be flexibility in the system. And you need to put the places in the right way where people need them, possibly where they might want them to be bit different then where they need it".

In the same manner, the policy manager elaborated on how making policies is full of decision-making and selecting options to form policies, he commented

Ref.96 "We would consult with the public and what we usually do using u-engage and sometimes we also do workshops things like that to get peoples' views, on what we're about to do, especially if it's particularly high level so you can see that that's how we go about making a policy or making a stand on things".

iii. Combination

Some tasks reported by participants involve combination of choice, generation and collection as part of a process. The findings show that policy making involves decision-making based on the collection of information and selecting among the potential policies for final policy formulation. Similarly, services like the admissions department collect applications full of information from the residents for the purpose of schools admissions and based on this information the Admissions module software assigns schools to potential students.

The admissions manager at LGA_C suggested that the use of IT to support information processing and helping residents make efficient decisions through the Admissions module technology. He emphasised how large information is collected, analysed and distributed on a regular basis through the help of IT. He reported:

Ref.97 "… So we can process large information, which comes from the residents, and ICT helps in processing it. Not only we collect information from residents we also provide them with information, which can help them in decision making. It would not have been possible with tiny group of people running this system without ICT help".

On inquiring of a policy manager about the tasks involved with combination characteristics of task he elaborated:

Ref.98 "Consultation tracker does not help you make the policies but helping you consult, collect and filter useful information for policy making. It facilitates the process and helps you collect information for analysing and organizing information".

iv. Collection

Analysis of the data and observations revealed collection as one of the major task characteristics existing in policy making and service departments in LGA_C. Participants perceived collection as an unavoidable task in LGA_C, considering all the departments from corporate services to public services and policy making. All decisions in the organisation are made by collecting information through research, surveys, consultation etc. When the project manager was asked to comment on collection as a task characteristic, he noted:

Ref.99 "To maintain parks we have different sort of levels within that obviously, we have our customers we collect information about them, like how sort of satisfied they are with the services and that would be fed in how we deliver our services".

On similar lines the admissions and transport manager, responsible for implementing changes to policies expressed his opinion on how large information is collected in the admissions department using IT help. He reported:

Ref.100 "Then there are essentially legal requirements about consultations on admissions and indeed on transport. So we have to consult with the period of at least eight weeks from beginning of November and first week of January. So we have to consult with schools and local authorities, the schools neighbouring borders with us, Church of England schools and we also consult with parents using IT, if there are major changes then we have public meetings".

5.4.9.6 Technology functional support

During the investigation for technology functional support in LGA_C communication support, information processing support and process structuring were confirmed to exist in the organisation.

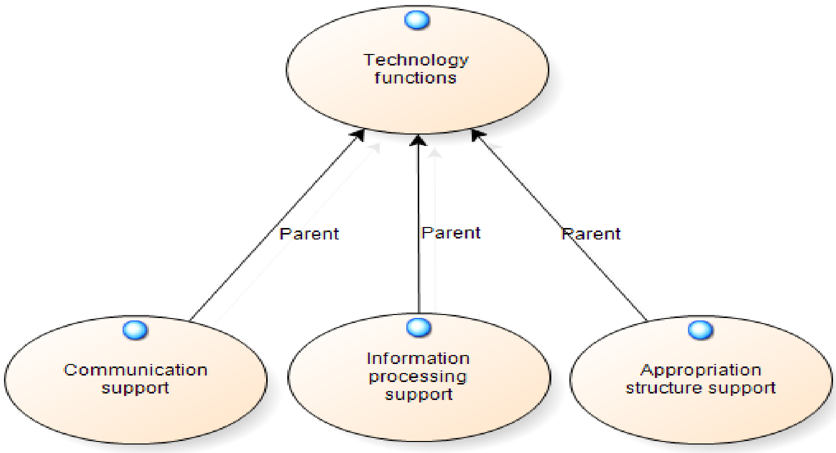

Figure 5.19: Technology functions LGA_C

i. Communication support

Results from the data collected in LGA_C showed information sharing and collaboration allows efficient communication support. Participants perceived information that can be exchanged between individuals or systems through technological functions as an important feature to be utilised in the organisation.

LGA_C shares large information with residents and other organisations though its website and promotes transparency and ease of access to information for the public. The admissions and transport department are constantly communicating changes to policies, new policies and other admissions related information with the residents though IT. An admissions manager explained how communication support of technology is utilised to share information with schools in the county by reporting:

Ref.101 "Most people apply online like 9/10 applies online. But when it comes to consultation, we have something it's called consultation tracker. We have policy and we want to send it out for school consultation and we send it to every school in the county. Their responses can come back electronically and we get notified if they have received the policy for consultation or not. So it's much quicker, consistent, organized and clear".

The policy and planning department in LGA_C is not any different in considering efficient ways of communicating with the public or within the organisation. The policy manager expressed his desire to have a technology that allows collaboration in performing a task and sharing information efficiently. He commented:

Ref.102 "We are also looking at share-point for collaborative tasks within the councils and an outside the council. There is high demand for collaborative work among the councils".

ii. Information processing support

Participants perceived that information processing support is a vital function for an information intensive organisation like LGA_C. Data suggests that for large information IT is adopted to process the information efficiently.

During the investigation it was observed that participants in the Admissions and transport services department were bombarded with information and it happens regularly throughout the year. There was flow of information coming from applicants for the year's intake with many queries through telephone lines as well. An admissions and transport manager elaborated the necessity of adopting Admissions module technology for timely, efficient and error free processing of information. He explained the significance of technology to be able to process information efficiently leading to less administrative time to process applications through an example and he commented:

Ref.103 "We have a year group assigning this year so about 7000, 8000 coming now. So it's a lot and there are 11 people in the admissions team. So, all the admission will go through those 11 people. There would be no way all those admissions can be done without the help of ICT".

Similarly, it was found in the policy making department that information is gathered to produce productive policies and when the policy manager was asked to comment on the significance of information processing, he reported:

Ref.104 "For child support and wellbeing, we need to collect, evaluate and record all the relevant information about the children and then it is used to inform and shape policies."

iii. Process structure support

Analysis of the data collected from LGA_C revealed that process structure support is one of the major functions of workflow technology that is adopted for the Education and transport department, which helps in gaining process efficiency, reduces costs and saves time, among other benefits.

Analysis of the documents (business case, Admissions and Transfers manual) and interviews with the participants revealed that Admissions and Transfers technology enables automatic allocation of schools and transfers to other schools according to the applicants' preferences and the local authority's criteria and polices. A project manager responsible for admissions and transfers technology adoption explained that automation and control performs tasks in admissions optimally allowing staff to be productive in other matters and she further commented:

Ref.105 "Admissions module technology provides ease of access to information, sharing with parents and other schools, automatic allocation of transportation service and school to pupils within their preferred vicinity. As mentioned there are many schools and large number of students applying for admissions which means a large amount of information is stored, organized and processed, so it helps with all that.

The policy manager also mentioned how automation, control and role resolution helps in policy making. Such functions of workflow technology reduces workload and saves time by routing tasks to the appropriate person, allowing notifications and tracking of tasks in the process. He further explained how technology is helping policy making by describing the use of the technology as:

Ref.106 "…for all our decision making, modern gov system gets all our reports to get approval about things and to share information. The matter compliance will do that, so we can set it up at different levels such as to send an alert, sign post where it is, sending a summary and sign to comply or creating a survey element so there's lots of different levels of functionality for that. Because it's not just one side it's all the policies that we have, so it will allow us to do that and also to track, control and follow up".

5.4.9.7 Summarising the findings from empirical data LGA_C

Findings from the empirical data collected from LGA_C shows that the majority of the factors selected from the literature for influencing workflow technology adoption have been confirmed through interviews, documents and observation. Some new factors were found to have an impact on decisions to adopt workflow technology and some did not qualify as being influential factors.

Technological factors were explored in LGA_C and it was found that relative advantage, compatibility, complexity and timescale were influential factors. Timescale emerged as an important emergent factor from the data that participants perceived to be effecting significantly the adoption of IT. The upgrade version of the admissions module, which allows the automation of the admissions process, was adopted with delay due to the longer timescale it required for implementation. Participants perceived timescale as utilisation of resources, which means cost and time consumption that can lead to delays in subsequent processes.

Analysis of the data collected for organisational factors revealed that managerial support, information intensity, cost and stakeholders are the important influencers, however, stakeholders turned out to be an emergent factor from the empirical data. Participants perceived stakeholders as to be important entities that are affected by the IT adoption and hence their involvement in decision-making can incorporate their opinions, which are vital for productive decision-making. The participants did not see organisation structure as an important influencing factor. They reported that flexibility in the organisational structure has mitigated the impact of organisational structure on decision-making. Communication is faster and decisions are made without bureaucratic hindrances. Moreover, they reported that individual budgets are allocated to departments, which promotes fewer interventions by top management. The participants also saw attitude as being not important enough to influence decisions to adopt IT. The findings revealed that employees are expected to perform better and adapt to a changing work environment hence leaving less space to accommodate negative attitudes. Resistance to change is overcome by effective communication of benefits and the rationale behind the change that influences employees' perception of IT adoption.

Environmental factors were analysed by the investigator and it was found from the results that government regulations have influence over decisions to adopt IT and competition does not significantly exist. One reason for competition's nonexistence is attributed to the fact that services are not competing for customers in LGAs. Each local authority is responsible for their principal area and residents will only be using their services. Also participants believed there is a lot of collaboration between the LGAs that allows sharing information for effective decision making relating to IT adoption. Competition was perceived to exist for the overall organisation and not at service level among the LGAs. The findings also revealed imitative pressure to exist and influence the decision to adopt IT. In the absence of competition between the services of LGAs there is sharing of information and systems without any hesitation.

Lastly task technology fit was investigated in LGA_C and the findings revealed that most of the data confirmed fit, technology functions such as communication support, information processing and process structuring and task characteristics which were generation, choice and combination. However, collection emerged as a new task characteristic from the findings. Participants perceived collection as a major task that prevails in every public service and corporate service of LGA_C. Information is collected through means of research, surveys and consultations and used for policy formulation and decision making in the organisation.

Table 5.8, illustrates the findings of the analysis conducted using data from LGA_C for a more complete comprehension.

No.	Factors		Interviews	Documents	Observations	Confirmed	Emerged
1.	Technology	Relative advantage	Ref.71,72	✓		✓	
2.		Complexity	Ref.73		✓	✓	
3.		Compatibility	Ref.74, Ref.75	✓		✓	
4.		Timescale	Ref.76				✓
5.	Organization	Managerial support	Ref.77			✓	
6.		Organizational structure	Ref.78			X	
7.		Attitude	Ref.81		✓	X	
8.		Cost	Ref.83, 84	✓		✓	
9.		Information intensity	Ref.79, 80		✓	✓	
10.		Stakeholders	Ref.82				✓
11.	Environment	Competition	Ref.85		✓	X	
12.		Government regulations	Ref.86	✓		✓	
13.		Imitative pressure	Ref.87				✓
14.	TTF	Fit	Ref.88, 89	✓		✓	
15.	Task	Generation	Ref.90, 91			✓	
16.		Choice	Ref.92, 93			✓	
17.		Combination	Ref.94, 95			✓	
18.		Collection	Ref.96, 97		✓		✓
19.	Function	Communication support	Ref.98, 99			✓	
20.		Information processing	Ref.100,101		✓	✓	
21.		Process structuring	Ref.102,103	✓		✓	

Table 5.8: Summary of findings from LGA_C

5.5 Conclusions

In chapter 1, the research problem was presented that states that there is a lack of a theoretical framework for WfT adoption. The aim of the research was to develop and evaluate a recommendation framework for WfT adoption in the policy making context. Chapter 3 presented the conceptual framework based on the literature review. Therefore, in this chapter the analysis of the three local government authorities is conducted to evaluate the framework. The number of cases has been limited to three, as mentioned and justified in chapter 4. Further case analysis would create theoretical saturation and no further benefits of investigating an additional case was found to be useful. The three cases have provided the necessary and relevant data to analyse and draw evidence to support or reject proposed factors for WfT adoption in LGAs and further development of the framework.

The majority of the factors proposed in the conceptual model have empirically confirmed the influence on workflow technology adoption by conducting data collection from the three case studies (LGA_A, LGA_B and LGA_C). Additionally, the data revealed some new factors that influence workflow technology adoption and some that were proposed by the conceptual model but were not empirically confirmed. The following chapter uses factors from the findings in this chapter to revise the conceptual model presented in chapter 3 and to present cross case analysis. The main conclusions from the data collected from the case studies have been presented as follows:

- Workflow technology adoption is influenced by factors of technology, organisation, environment and fit for purpose reasons. The context of the phenomenon provided human behaviour and organisational behaviour for study. Workflow technology with its functional capabilities has influence over adoption decisions when evaluated with task requirements.

- Some factors emerged from the empirical data to influence the decision to adopt workflow technology, which are timescale, stakeholders and imitative pressure from the contextual setting. These factors are not specific to any one type of technology but cover all the IT and results have shown its impact on workflow technology adoption in all three case studies. The findings have also revealed collection as an important function of workflow technology that allows users to gather information to be recorded and used for information processing. These new factors add strength to the conceptual model by incorporating concepts from practice.

- Evaluating the conceptual model through empirical data also revealed organisational structure, attitude and competition to be insignificant in affecting the decision to adopt workflow technology. The findings suggest that due to the nature of the unit of analysis, competition does not exist. Hence, competition was perceived by the participants in the three organisations as insufficiently important to affect the decision to adopt workflow technology. It was found that due to changes in economic and social conditions organisational structure and attitude has had little impact on decision making. The findings from the empirical data inform the literature of such changes in the context of the phenomenon that has necessitated the revision of important influential factors of workflow technology.

- Fieldwork evidence from the three case studies confirms application of the proposed conceptual framework to be appropriate and useful for analysing factors influencing workflow technology in local government authorities. Analysis also confirms conceptual framework as a recommendation framework for managers in public organisations to anticipate factors impacting decisions to adopt workflow technology from a complex contextual and functional perspective and prepare a business case accordingly.

CHAPTER 6:CROSS-CASE SYNTHESIS AND DISCUSSION

6.0 Introduction

This research aims to understand the contextual and functional factors that influence decisions to adopt workflow technology (WfT) among local government authorities. Particularly, to propose a recommendation framework that the public policy makers can adopt to analyse factors that influence decisions to adopt workflow technology.

As highlighted in chapter 2, there is a need for understanding what factors influence the decision to adopt WfT. Much of the technical issues have been discussed in the literature relating to WfT, however, management and behavioural issues have been neglected (Storh and Zaho, 2001). Hence, there is insufficient research from the WfT adoption perspective and there is a lack of an empirical framework for WfT adoption (chapter 2 and3). Among the IT adoption theories, discussed in section 2.6, Technology, Organisation, Environment (TOE) theory and Task Technology Fit (TTF) theory were selected to explore for factors identified within the literature and emerging factors from case studies. Chapter 3 developed an initial conceptual framework for WfT adoption by arranging TOE and TTF factors identified within the literature, which provided a holistic view and greater explanatory power, and this framework was evaluated in chapter 5.

The preceding chapter presented a within-case analysis and a detailed case write-up for each of the cases selected in this research. The detailed write up allowed incorporating the context of the phenomenon while each case study was analysed for influential factors of WfT adoption. Data analysis revealed some new factors that influence WfT adoption and a few factors that were identified from the literature, which was not confirmed by the empirical data. Mostly, due to the context of the case studies (LGA) that has altered the impact of these factors, which also highlights the importance of considering TOE theory to investigate for influential factors in a different context. As the literature suggests context influences the phenomenon under investigation (Alajoutsijärvi and Tikkanen, 2002).

The present chapter presents a cross case synthesis and a discussion to provide a more holistic and comprehensive understanding of the factors that influence decisions to adopt WfT. Cross-case analysis also enables the study to highlight significant issues and details about the multiple cases under investigation in the research. According to Miles and Huberman (1994), cross case synthesis provides a more sophisticated description of the analysis under multiple case studies rather than to analyse data from a single case. It will also bring out contrasts and similarities among the cases studies with respect to the factors analysed (Hartley, 2004). Moreover, in doing so, under each cross-case finding a theoretical discussion is provided which enables the study to link up the emergent themes with theoretical outlooks.

The chapter is divided into four sections, including section 6.0 that is the introduction to chapter 6. The next section 6.1 presents the cross-case synthesis and discussion on the important factors influencing WfT adoption among the three case studies. Section 6.2 offers a revised conceptual framework for workflow technology adoption. Next, section 6.3 focuses on the applicability of the framework to the policy making domain, justifies through logical linking and highlighting similarities that exist among the task requirements, between the practicing departments and potential adopters (policy making department). Lastly, section 6.4 presents the conclusions derived from chapter 6.

6.1 Factors Impacting Decisions to Adopt Workflow Technology

To strengthen the analysis of the research, this study conducts a cross case analysis after analysing the proposed framework within each case study. Carrying out cross-case analysis allows this research to identify major similarities and emerging themes among the case studies. According to Yin (2003), to demonstrate high quality analysis, however, techniques or strategies have been adopted, it is important to address all the relevant evidence, rival interpretations, most significant aspects of the cases and analysis imbued with the researcher’s own expert knowledge.

Cross case analysis supports the high quality of the analysis through strong argumentative interpretations. The analysis has been divided in order to study the contextual perspective to delineate and highlight the key dominant contextual factors under technology, organisation and environment themes. Next, analysis of the functional perspective (Task Technology Fit) provides twofold supports, one for analysing factors relating to the task and technology fit and the other to further abstract similarities between the units of analysis. Contrasting the two units of analysis supports this research in proposing a framework for workflow technology adoption in the public policy making domain.

6.1.1 Cross-case synthesis and discussion of factors impacting WfT adoption

As highlighted in chapter 3, the literature is lacking in studies identifying influential factors for determining decisions to adopt WfT. This study selected TOE and TTF theories to identify IT adoption factors from the literature and to be able to include both contextual and functional levels of perspective for the investigation. Tables 2.16 and 2.17 in chapter 2, lists most of the studies undertaken to analyse factors from TOE and TTF theories that influence IT adoption. It also demonstrates a gap analysis that signifies lack of application of the two theories in the workflow technology context.

Common technological factors identified from the application of TOE theory in table 2.16 are complexity, compatibility and relative advantage as the set of technological factors. To study the organisational factors managerial support, organisational structure, attitude and information intensity were selected. Environmental factors that were driven from the table 2.16 as most commonly mentioned in the literature were competition and government regulations. TOE theory enables the study to explore for influential factors from the internal and external context of the phenomenon. It is important to include the contextual perspective because of the influence of the context of the phenomenon, which affects business processes and consequently the outcomes (Hughes, 2006; Self *et al*., 2007; D'Ambra and Rice, 2001). The researcher argues not to neglect the functional perspective of the phenomenon and creates a synergy by incorporating TOE and TTF theories into the WfT framework. The two theories have greater explanatory power and allow the researcher to investigate the phenomenon in its complex domain and analyse technology's utility effect through task technology fit. Therefore, this research identified generation, choice and combination as task characteristics and communication support, information processing support and process structuring support as functional factors of the phenomenon. Fit between the task characteristics and technology functions leads to IT adoption and this theory is evaluated in the LGA domain in order to have a holistic view of WfT adoption.

The following sections present the contextual (TOE) and functional (TTF) set of factors, which impact workflow technology adoption. The proposed framework was applied to three local government authorities in the UK to explore for the factors impacting the decision to adopt workflow technology. After, the empirical data was collected from the case studies, an individual case analysis was conducted to highlight the significance of influential factors. Next, a synthesis of the three case studies revealed factors that influence WfT adoption. The synthesis of the three cases for Technological, Organisational and Environmental factors are summarised in table 6.1, which provides a cross-case reference to the three case studies that is adopted for the research. Next, Task Technology Fit factors are cross-case synthesised and influential factors are discussed to present a functional perspective. Table 6.2 exhibits the evidence from the three case studies to indicate the impact of the proposed factors.

Factors		LGA_A	LGA_B	LGA_C
Technology	Relative Advantage	Benefits, costs savings, process efficiencies are some of the RA that is the ultimate deciding factors.	Relative advantage is used to justify IT adoption and related cost.	Due to budget restraints investment in IT is focusing to reduce cost, gain relative advantage by in.
	Complexity	Greater training required to operate a IT defines level of complexity that hinders adoption of IT	Minimal training infers less incurred cost and less complexity of a technology that is easily adopted.	Complexity of IT impedes decision making due to training cost and skills required to operate optimally.
	Compatibility	Technology integration with IT infrastructure and legacy systems is vital element for IT adoption.	Standardisation commonly practiced by the vendors that lead to less compatibility issues.	Compatibility with legacy systems and software updates encourages IT adoption.
	Timescale	Longer time period to adopt WfT will reflect negatively on decision-making due to incurred cost due to delays.	Technology adoption time means benefits will be reaped in later time and resources underutilised.	Longer timescale for IT adoption can impede related processes and can leaves some processes ideal
Organisation	Managerial support	Managerial support endorsed WfT adoption by accelerating decision-making process.	Managerial support is a driving force for IT adoption.	Senior managers persuade staff members to use new IT and rolling out the technology faster.
	Attitude	Managerial support through communicating benefits and training reduces resistance to change and enhancing positive attitude.	People show less negative attitude towards IT adoption due to poor economic conditions, higher awareness of IT and greater managerial support.	IT benefits to the organisation enforces employees to adapt to the changes. Also, communication and training eliminates negative attitudes.
	Organisational structure (OS)	Flexibility, individual budget and managerial support minimises influence of OS on decision-making of IT.	Autonomy and individual budget allocation increases flexibility hence reducing impact of OS	LGAs are more inflexible organisation, which allows smooth flow of information and decision-making.
	Information intensity (II)	Information intensive nature of LGA_A demands IT support.	Greater information intensity creates need for IT support for processing information.	To reduce workload and improve performance IT is required to process large information efficiently.
	Cost	Limited funds and increasing demand for cost reduction and savings makes cost an influential factor.	Due to budget limitations, greater cost will hinder IT adoption.	Budget constraints increases the impact of cost on IT adoption in LGA_C.
	Stakeholders	Opinions of effected parties and interest groups are considered while making decisions to adopt IT.	Stakeholders have impact on decision-making process for WfT adoption.	Stakeholders are involved to facilitate decision-making process and to have effective outcomes.
Environment	Competition	Each council is responsible to provide service to its own principal area and LGAs do not compete.	Competition is disregarded at service level in LGAs and does not impact IT adoption decision	Competitions might be at the overall performance of the council but non at departmental level.
	Government regulations	Central government budget cuts and promotional activities effects decision to adopt IT.	Government legislations, policies and budget allocations effect decisions in LGAs.	Government influence through technical standards and funding decisions to adopt IT.
	Imitative pressure	LGAs have certain level of influence on IT adoption for improved service deliveries and relative advantages.	IT success stories of LGAs influence decision to adopt IT among the LGAs.	LGAs share information to improve services but also focus on what works best for the organisation.

Table 6.1: Cross-case synthesis of contextual factors (TOE)

6.1.1.1 Technology factors

Data analysis suggests that all the three cases found technological factors (Relative advantage, Complexity, Compatibility and Timescale) to influence workflow technology adoption. *Relative advantage* was found to have significant impact on the decisions to adopt WfT. All the participants, from the three cases, believed that benefits and process efficiencies are perceived as a relative advantage of IT, which justifies its cost and means to enhance process outputs. Due to budget constraints relative advantage has become an important factor for LGAs to consider for IT adoption. Workflow technology was adopted by all the three cases based on relative advantage as one of the factors to justify decision making. If the organisation perceives a technology to provide better benefits than its precursors, technology adoption will have positive results. Similar findings were found in the study by Thong (1999) and Premkumar and Ramamurthy (1995) who found that businesses which used new technology to carry out tasks with relatively greater benefits had a positive attitude towards adoption.

The findings for technological factors also revealed that if the *complexity* of the technology is high, it will have a negative effect on decisions to adopt workflow technology. All the three cases reported complex technology requires special training skills and knowledge, which means increased cost and timescale of adoption. Also, lack of required skills and knowledge can impede the adoption process by creating resistance towards usage of the technology. Therefore, complexity of IT has to be lowered to reduce one of the obstacles to IT adoption. Thong (1999) suggested reducing inadequacy of knowledge and skills for IT usage to increase chances for its adoption. Hence, promoting IT culture in the organisation and hiring employees with IT skills will reduce the level of complexity seen by the users and promote a positive attitude towards new technologies. Reduced perceived complexity also infers that the timescale for new IT to be adopted will be influenced positively and the system will be running sooner.

Collectively, data from the three case studies revealed that *timescale* is an important factor to consider during decisions to adopt workflow technology. When the new technologies take longer time to implement and to be adopted, it will incur extra costs and wastage of time and resources. The findings related to timescale are consistent with the research findings by Kamal, *et al*., (2012), which state that timescale is an important internal pressure factor for adoption of IT. It can be explained as users of the technology will be underutilised due to technology implementation by assigning them to indirectly related tasks. Moreover, for interrelated tasks the subsequent task will be delayed leading to unsatisfied outcomes. Cost will not be justified through output as the task will be put on hold till the new system is integrated into the IT infrastructure of the organisation. Therefore, it is important for decision makers to know the timescale required to implement and adopt a technology before decisions are made. Additionally, managers should reduce the gap between the strategic planning and realistic execution of the IT projects. Lastly, technologies which are compatible with existing systems and work procedures of the organisation will reduce the overall timescale of technology adoption.

The forth factor in the set of technological factors is *compatibility*. The majority of the participants in the three cases reported that compatibility was an issue that decision makers consider during IT adoption. It is important for the new technology to be able to integrate with legacy systems in the organisation. Technologies that are unable to integrate fully with the existing systems will not be adopted, as on the contrary, it will demand replacement of existing systems that will incur heavy cost. Moreover, technologies that require frequent upgrades will also cause problems and hence such technologies are not favoured for adoption. Technological compatibility is not only an issue with existing systems, but as well with values and practices of the organisation (Zhu *et al*., 2006). However, during the data collection, participants mentioned compatibility issues with existing systems only. One of the explanations abstracted can be due to management support, users are provided with training and through technology champions the benefits of the technology are communicated to employees. This helps in turning the negative attitude of the users towards the new technology to being positive and reduces conflicts arising with the values and practices of the employees. It is also consistent with the suggestion by Goodhue *et al*. (1992) that states that high compatibility leads to acceptance of technology in the organisation. One of the case studies reported that the supplier’s approach towards standardisation has reduced impact of compatibility issues on decision making. However, concerns of compatibility are always there because ignoring compatibility issues before adoption will cost financially and productive loss.

Therefore, it can be argued that if a new technology is easy to use, consistent with the organisation’s practices and systems and can yield better benefits than its precursors it will have a shorter timescale of adoption. Collectively these factors will affect the attitude of the employees and decision-makers positively towards adoption of technology.

6.1.1.2 Organisational factors

Organisational factors are the second set of contextual factors analysed in this study. Empirical findings from the three case studies revealed *Managerial support, Cost, Information intensity and stakeholders* are among the organisational factors that have impact on decisions to adopt workflow technology in the policy making context.

The first factor belonging to the set is *managerial support* that the participants and the data have been revealed to have significant influence over workflow technology adoption in LGAs. Managers with the relevant IT skills and knowledge regarding the new technology are co-opted to act as champions to help in promoting the benefits of using the new technology. Better communication of the technology’s relative advantages to the users will influence their perceptions towards the technology and promote a positive attitude. Such an approach for persuading the organisation to use proactive decision modes, for new technology adoption, acts as a catalyst for a faster and smoother decision making process. It was the common perception among the case studies to see managerial support as a driving force behind the successful adoption of new technologies.

The empirical findings are in line with many studies that highlight managerial support’s impact on effective adoption and deployment of the new technologies (Thompson, *et al*., 2006b; Chatterjee *et al.*, 2009). This study indicates that the managers and senior managers of the organisation should have adequate knowledge and skills of the new technology before they implement it with the users. Hence, the top managers should have a clear understanding of the benefits and drawbacks of the workflow technology to encounter resistance from the users and eliminate their fears about the adoption of the new system. Moreover, managerial support can accelerate the decision making process by communicating to the decision makers the scope and nature of the technology with reference to business goals and task requirements. Hence, this study is supportive of the notion that managerial support is vital for faster and optimal adoption of workflow technology by the users and that managerial skills and knowledge play an important role in communicating the significance of technological change within the organisation.

Empirical findings from the case studies reported *organisational structure* as a less significant factor to impact decisions to adopt workflow technology in LGAs. Participants reported as the organisation has moved from rigid structures to more flexible ones, it has eased the decision making process relating to IT adoption among the departments. Also, as long as the managerial support exists in the organisation, the structure of the organisation does not affect decision making. Each department is allocated with individual budget and much of the autonomy is given to the managers of the departments, hence decision making has become decentralised. Most of the formal and informal processes are removed from the decision making process which used to delay decisions due to slow flow of information. Allocating separate budgets encourages responsive decision making and makes it easier to involve users' opinions and other effected parties.

The empirical findings relating to organisational structure in this study was not confirmed by the cases as an important factor for workflow technology adoption. One of the explanations can be presented as that LGAs are moving away from rigid hierarchies, structures, processes and attitudes and are now encouraging flexibility in the organisational structure. Research studies by Goodhue *et al*. (1992) and Barua, *et al*. (2004) also suggest that flexible structures do not impede deployment of innovation they facilitate decision making. Moreover, LGAs are embracing e-government culture that has promoted autonomous IT decisions and IT solutions based on individual department requirements (Di Natale, 2003; Aldrich *et al*., 2002). It can be concluded from the analysis of the three cases that the organisational structure in LGAs does not impact negatively on the decisions to adopt workflow technology due to its flexible structures encouraged by e-government culture.

Another factor that belongs to the organisational set is *cost.* There was a mutual perception among the three cases for considering cost as the most important factor to influence the decision to adopt WfT. Central government influences LGAs through funding and big cuts in budget which in turn lays pressure on cost savings and increase in benefits. Cost primarily is used for cost-benefit analysis that propels organisations to either adopt a technology or reject it due to the high associated cost and low benefits.

It appears from the empirical data that there is immense pressure on LGAs to reduce their costs, which also motivates organisations to adopt IT. For example, LGA_A adopted Agresso technology (WfT) to keep the cost down in the finance department and streamline procurement practices. The findings relating to cost are also in accordance with the past studies that suggest LGAs often seek IT to reduce cost and increase benefits (Beynon-Davies, 2005; Kamal M. , 2006) and that cost is a barrier to IT adoption (Ebrahim and Iran, 2005). Cost can be justified through the relative advantage of the technology, however, it requires managers to understand the technical benefits and to be able to communicate with the stakeholders effectively for a favourable decision. On the contrary, sometimes IT can incur post purchase costs such as training users to optimally utilise the system and maintenance and upgrade costs. Hence, user friendly technologies may not incur extra cost or hiring staff members with IT knowledge and skills can also reduce post purchase costs. Compatibility of the technology can also reduce maintenance and upgrade costs.

Lastly, *stakeholders* were revealed as a significant organisational factor. Among the participants and from the supporting data it appeared that stakeholders play an important role in effective decision making and influence WfT adoption in LGAs. Stakeholders were described by the participants as peer groups and any associated entity that is influenced by the technological change in the organisation. For this research, the stakeholders were mentioned by the participants as mostly the users, managers, IT department and for high scale IT projects top management are included as well. Stakeholders' involvement can influence the decision making process by endorsing decisions to adopt IT and can impact negatively if they are not convinced of the use and benefits.

In this study it can be argued that for WfT adoption in LGAs stakeholders can act as an impetus if they are informed properly of the benefits of the technology. As seen in LGA_B scenario of iTrent (WfT), stakeholders from corporate services, senior managers, users and external groups were involved to produce a decision with the best solution for the organisation. This was to safeguard the organisation from future issues relating to integration with the legacy systems, practices and values of the organisation. The emergent factor is also aligned with the findings from a recent study conducted to analyse empirically Enterprise Applications Integration adoption in the UK LGAs (Kamal, Hackney, & Ali, 2013). Stakeholders' self-interest should be matched with other stakeholders to avoid conflict of interest and delays in the decision making process.

The third set belonging to the contextual dimension is *environmental factors*. Empirical findings from the three case studies identify *government regulations and imitative* pressure as important influential factors for WfT adoption in LGAs and *competition* as an unconfirmed factor. Analysis of the data revealed that participants from the three case studies believed there is no *competition* among the LGAs. It also differentiates the public sector from the private sector where competition is a driving force behind many strategic decisions. Public organisations do not compete for market share in the same fashion as the private sector does, especially, when LGAs are allocated with principal areas with residents confined to those areas.

This study argues that market based competition does not exist between the neighbouring LGAs and it is seen as a context specific factor which will have a different impact based on the domain of the phenomenon under investigation. The findings complement literature asserting that competition is a domain specific factor (Kamal, Hackney, & Ali, 2013). On the contrary, it can be argued that there is indirect competition existing in LGAs to deliver services of higher quality in order to secure funding from the central government. Since funding is limited and budget is mostly under pressure, LGAs have to demonstrate their eligibility to acquire funds from the central government, through indirectly competing with neighbouring LGAs on aspects of service quality (Kamal M. , 2008). Additionally, central government's pressure to advance in innovation and e-government can create an unprecedented competitive atmosphere for LGAs. Another indirect impact of competition on IT adoption comes from hiring IT staff and LGAs have to compete with the private sector to attract IT skilled people which will facilitate IT adoption (Ebrahim and Iran, 2005). Prior studies on IT adoption in the public and private sector should consider investigating competition from domain specification which will bring forward different perspectives of competition and its role in IT adoption.

Government has influence over both private and public industry through regulations and policies. Among the environmental factors *government regulations* has a significant effect on WfT adoption in LGAs. Empirical data from all three case studies asserts government regulations have affected their decisions to adopt IT. Case studies reported that through budget cuts, ICT funding, e-government targets and emphasis on information sharing and better service deliveries have influenced their decisions to adopt IT.

Prior studies highlight impact of government regulation on IT adoption, which supports the findings of the research (Kaun and Chao, 2001; Zhu *et al.* 2006b; Pan and Jang 2008; Ebrahim and Iran, 2005). Financial resources determine capacity of the LGA to invest in

IT and government regulations cutting budgets makes the decision to adopt IT harder and needs more convincing from the managers. Central govenrment funding has been mentioned in the literature as acting as a major barrier for IT adoption in the public sector (Ebrahim and Iran, 2005; Ho, 2002). Policies that require public organisations to be transparent can push IT adoption for better control and sharing of information between residents and the organisation, and between organisations.

The third factor to form the set of environemtal factors is found to be *imitative pressure*. It was found among the case studies that participants mutally agreed that there is inter-organisational influence on decisions to adopt IT because of the external pressure created by other organisations to pursue similar strategies for enhancing service quality and working procedures for better results.

Imitative pressure is an emergent factor in the LGAs domain, which has been mentioned in prior research as mimicking other organisations' success strategies (Soares-Aguiar and Palma-Dos-Reis 2008). However, in the public sector domain there is insufficient research on the impact of imitative pressure on IT adoption. Imitative pressure has been highlighted by well-grounded theory, the institutional theory of DiMaggio and Powell (1983), which highlights the impact of imitative pressure on IT adoption decision making in organisations. The three case studies have mentioned that their decisions to adopt WfT were influenced by success stories of neighbouring councils. As the government encourages information sharing between the LGAs it allows learning of strategies that enhances service delivery. Participants reported that there is a regular dialogue between the LGAs and discussions over what works best for them that can be imitated by other organisations. This also highlights that there does not exist competition among the LGAs and service improvement strategies are openly discussed.

6.1.1.3 Task Characteristics

Potential technology is evaluated against the characteristics of the task it is meant to serve. Therefore, to understand the fit between the technology and the task it is important to first identify the task characteristics. Empirical findings of this study revealed *generation, choice, combination* and *collection* are the task characteristics that affect decision to adopt workflow technology.

Data from the three cases revealed that both the service departments and policy making entails tasks that require generating information. Information and ideas are generated to develop reports, policies, documents, results of planning and budgeting etc. *Generation* is a common task that prevails in every department in the LGA. Communicating information between the departments and within the organisation is a frequent task, which requires ICT for effective communication of the information.

Findings of the study suggest that information is exchanged and shared frequently in the LGAs. The sharing of information defines the task characteristic as generation of information in formats of reports, ideas, policies etc. In the admissions department of LGA_C information regarding schools admissions is generated in the form of letters to the residents who use this information to make effective decisions relating to admissions of their children. The idea or information generation is an important task characteristic in any business environment (McGrath, 1984). Dennis *et al.* (2001) suggests that for tasks that produce ideas should be categorised as generation tasks and require communication support. IT allows information to move from one point to another without getting distorted. Hence, information can be efficiently transferred and shared if appropriate technology is utilised.

The second element that defines task characteristics is *choice.* Among the case studies it appeared that the majority of the tasks involved decision making and selection activities. Selecting what policy options are best to represent public needs, making decisions on budget allocations, approving holidays, selecting candidates for job applications. Choice is defined as selecting and decision making which makes it an important determinant for workflow technology adoption in LGAs.

Findings from the analysis of the case studies confirm Choice as a task characteristic. Polices are made after selecting from options generated through research and consultations. Similarly, (Straus and McGrath, 1994) has defined tasks as intellective and judgemental task, which describes the activity of the task that chooses between the options. Such tasks are involved in decision making which can be seen in the majority of functions in LGAs. It is supported by a research study by McGrath (1984) who explains that choice is a task activity commonly found in group tasks, hence, demanding coordination and collaboration functions.

The third characterisitic of task is *collection* in the set. Findings from the empirical data suggest there are activities among the tasks that store, receive and gather information in different forms which identifies collection as one of the major task characteristics. Collection is a task charactertistic that mostly exists in LGAs, which determins adoption of WfT by seeking a match between the function of the technology and collection activities.

From the empirical data, collection emerged as a task characteristic that prevailed commonly among the service departments and policy making. Whether it is strategic decision making, budgeting, policy making or planning, it all requires collecting relevant information from different entities to make sound decisions. LGA_A mentioned in the finance department that large information is collected from across the service departments and partners and later analysed and reported. However, collection of information and collating it is an important aspect of financial functions. On the other hand, public policy making is a process that involves identifying solutions to the issues effecting public life. Therefore, an effective policy is created by collecting information through research and that collecting residents' opinion via consultations. The collected pool of information is fed into the decision making process to generate polices. Past studies have discussed generation as a task characteristic, however, collection has been ignored (McGrath, 1984; Straus and McGrath, 1994; Dennis *et al.*, 2001). It can be argued that there are tasks that generally generate information which is then stored at some point for retrieval at a later stage. However, it reduces the importance of the collection characteristic of the task that is responsible for gathering information from different sites.

Combination is the fourth characteristic of task in LGAs. Analysis of the data showed significant evidence for activities that require combination of generation, choice and collection activities in a task. The findings suggest that combination is a characteristic that is influential in determining WfT adoption in LGAs.

Results of the study shows that there are some tasks that require a combination of task characteristics which is in line with the findings of Dennis *et al.*, (2001). Processes like the analysis require a combination of task characteristics to produce outputs, such as generating options and selecting for decision making. LGA_A mentioned that corporate departments produce reports by collecting feedback from departments of the organisation and producing a report. In policy making analysis it is a vital stage that gathers options collected from consultations and research and from these options draft policies are produced and sent for approval. In LGA_C a consultation tracker is adopted to collect feedback and filter useful information for policy formulation. This shows that the policy making process entails a task that uses the combination characteristic to produce effective policies.

6.1.1.4 Technology Characteristics

Technology characteristics are the functional capabilities that a technology has to carry out task requirements. The set of technology characteristics of WfT, which the data has revealed includes *communication support, information processing support and process structuring support*.

One of the most general reasons to adopt IT is to facilitate communication processes in the organisation. *Communication support* of workflow technology has been mentioned among the three case studies as significant functional support for sharing information. Communication support such as collaboration and coordination allows sharing of information between the users who may be present at various sites.

Findings suggest that through communication support of WfT case studies have managed to coordinate and collaborate effectively. LGA_A highlighted that a lot of information is generated from service departments through Agresso for Finance and HR departments. Policy makers expressed their desire to adopt IT for effectively transferring information on new policies and any changes that have been made to old ones, to the residents. Inappropriate use of communication support can also take away focus from relevant information if too much information is shared with irrelevant people (Dennis, Information Exchange in Group Decision Making: You Can Lead a Group to Information, But You Can't Make it Think, 1996b). For instance, in the case of LGA_B admissions policy it should not share too much information with the residents relating to the admissions policy otherwise it makes things confusing for decision making. This will push people to revert to traditional face-to-face information seeking ways rather than from ICT.

Information processing support is the second characteristic belonging to the set of technology functions. Participants believed that information processing is a vital function for LGAs due to the information intensive nature of the business. It is one of the factors that are considered during the decision-making process to adopt WfT.

The findings suggest that IT necessity is increased when information intensity is higher. Hence, LGAs that serve a large population through services require IT support to carry out tasks. For instance, in LGA_C when it is school admissions time, they receive information from over 7000 applicants which needs to be filtered, organised and stored. With a small number of people handling information it becomes imperative to adopt IT to process information efficiently. The Admissions department utilises WfT for information processing tasks such as information sharing between the residents and associated agencies and schools, analysing information for allocating schools to the right applicants and help in effective decision making. A similar perception has been expressed in the literature by Georgakopou and Hornick, (1995) and Mentzas *et al.*, (2001) who suggest WfT is adopted for its automation capability to process large information efficiently. On the other hand, policy makers from the three cases suggested that policy formulation is an information intensive task that gathers information from various sites and that aggregating and processing requires IT support for better policy outcomes.

WfT information processing support has enabled the three cases to increase performance efficiency, reduce run time errors, shorten processing time and enable richer information sharing. The findings conform to the literature that suggests information processing support improves performance by enabling synergies through information sharing and reducing incomplete task analysis by aggregating information and evaluation (Nunamaker, Dennis, & Valacich, 1991).

Lastly, *process structuring* support makes the third functional factor of the technology characteristic set. The findings suggest that participants see process structuring support as an important function of WfT for better information sharing, control, monitoring and role resolution. Analysis of the data revealed that the process structuring support function of WfT is an influencing factor for decisions to adopt WfT in LGAs.

The Process Structuring support function is vital for achieving efficiency in performance and achieves better control. Task requirements among the LGAs, such as decision making, evaluating and information sharing, requires allocation of roles to the employees to perform certain sets of activities and authorisation of access and control of information to the staff members. For instance, in LGA_C admissions department can automatically route information to the right applicant without delays and extends access to the residents to the information regarding admissions policy. The Admissions module technology (WfT) allows structuring of the admissions process and task activities to be carried out efficiently in the organisation. Hence, Process Structure support enables proficiency in the flow of work with designated tasks, paths and control for higher performance outputs. The Process Structure support capability of WfT has been mentioned in the literature as a functional support to enhance final outcomes (Sell and Braun, 2009). Stohr and Zhao (2001) have expressed similar perceptions on the WfT's capability to provide a structure to the business process and allow automated information flow for important tasks in the organisation.

Policy makers from the three case studies have expressed their desire to automate policy formulation tasks where information can be controlled and tasks can be routed to the right department. Since policy making is a collaborative process it requires better control, coordination and monitoring for quality purposes and therefore obligates WfT support.

6.1.1.5 Task Technology Fit

Fit between the task activities and technology functional capabilities determine the adoption of IT. Empirical evidence collected and analysed in this study suggested that WfT would be adopted readily if the technology's functions match the task characteristics. Fit is one the most important factors for evaluating adoption of a potential technology, for it to bring value for money to the organisation.

Findings suggest that technology's functional capabilities to carry out a task efficiently were major reasons to adopt WfT. An example from LGA_C highlights Admissions Module technology (WfT) adoption which brought value for money and enhanced task performance. Performing a task with large information processing activities in the admissions department was only possible due to WfT adoption. As the number of staff members for processing the information was far smaller than the amount of information to be processed, utilising WfT enabled them to process information with less resources and better results. In this scenario the functional capabilities of the WfT matched the task requirements that led to better results than it would have without one and encouraged its adoption.

Evidence from the data collected shows fit between the task characteristics and WfT functions. For instance, the communication function of WfT supports generation tasks such as giving out information to the residents in LGA_C or employees in LGA_A and

LGA_B. Mentzas *et al.* (2001) explains that WfT allows exchange of information through coordination and collaboration functions of the technology. For simple tasks such as generating or collection of information, WfT‘s communication support fits in best to serve the purpose. These geographical capabilities of WfT allow the distribution of information across different locations (Zhao *et al*., 2000 (e); Salimifard and Wright, 2001) and from case study LGA_C, it is evident that the admissions department shares information electronically with residents and every school in the county. Similarly, the generation and collection of information exists in the policy making context and these simple tasks require effective communication that will allow information to be shared so that collaborative activities can take place.

For task activities like choice where information is selected and decisions are made, both verbal and electronic communication along with information processing support of the WfT is required to serve the purpose of the task well. The payroll department of LGA_B adopts iTrent (WfT) to make decisions on an employee's holiday request or financial claims. The tasks involved have a choice characteristic that is best served through WfT's of information processing and then communication support to forward the approval or disapproval of the request to the employee in the organisation. In this manner, information is not lost on the way, neither are there any delays due to moving information manually around. The literature supports WfT's capabilities for information processing and analyses to enable decision makers to evaluate options and make effective decisions (Aguilar-Saven 2004; Bae, *et al*., 1999). In the policy making context in LGA_B, decision makers select an appropriate policy from a pool of alternatives collected through research and consultations and this decision is communicated with the residents and the council members. Workflow technology's capability of processing information, coordination, collaboration and sharing information fits with the purpose of the decision-making tasks in the policy making context.

Lastly, the *combination* characteristic that involves either generation or collection and choice characteristics requires all the three functional characteristics of WfT. Communication support is to collect information, information processing support to gather, analyse and make decisions and process structure support to route information and activities to the right person, control, automation and monitoring activities. Organisations adopt WfT for its ability to automate tasks and business process modelling (Basu and

Kumar, 2002). Findings from the empirical data suggest that WfT is adopted to achieve performance efficiency, better control and flow of information. LGA_B highlighted that WfT helps the HR department to have a structured flow of task activities. For instance, the hiring process in LGA_B utilises all three functional characteristics of WfT, which allows the department to collect applications, organise, analyse, short list candidates, and provide them with relevant information. The hiring process is information intensive due to a large number of applicants applying for jobs in the council and hence requires an efficient information processing mechanism. Process structuring support has also been mentioned by LGA_C as functional fit for policy making tasks. Adoption of Modern-gov technology provides access to information through authorisation mechanisms, routing activities, sending notifications and tracking services that promotes better control, time-saving and reduced workload. Rule based information transitions qualify staff members to access information from different locations and to contribute based on authorisation (Stohr and Zhao, 2001). Automatic qualifying participants of the task activity provide better control for decision-making activities that are crucial and role restricted.

Findings of the study for Task Technology Fit are in-line with the studies by Dennis, *et al*. (2001) and Zigurs and Buckland (1998) that empirically studied the Group Support Systems effect in Task Technology Fit theory. The studies suggest that for generation tasks verbal and electronic communication fits to serve the purpose of the task, for choice tasks both communication and information processing support is required and for combination tasks all three functional dimensions are important to best serve the purpose of the task.

Factors		LGA_A	LGA_B	LGA_C
Task characteristics	Generation	• Various reports are produced to support service departments which generates large information for the organisation • Policies are published for the public and the organisation for informational use.	• Information relating to holiday request, travel claims are some of the examples generates information in HRand payroll. • Consultations with local people generate large information.	• Information regarding admissions is sent out to parents automatically and information is generated using admission module technology. • Ideas are generated by the policy makers and through consultations for public policies formation.
	Combination	• Change analysis and effective business decisions require collecting information, analysing, selecting alternatives and making decisions. • Policies are generated after collecting information, analysing for alternatives and selecting best options.	• Mangers in payroll department collect information on employees, generate reports and take decision on financial matters. • Policy making combines different activities in a task to generate policies.	• Admission process involves collecting information from parents, making decisions and generating information for parents' decision making. • Consultation tracker used by LGA_C helps to consult, collect and distribute information.
	Collections	• Financial analysis requires collection of information from employees to generate financial reports. • Public consultation generates large quantity of information to be collected and analysed.	• HR department receives information from applicants and staff members in large quantity. • Consultations with local people generate large information to be stored for analysis.	• Collection of information is one of the major tasks in admissions department. • Collection of information in policy making is done through research, surveys and consultations.
Technology functions	Communication	• Agresso is used for effective collaboration and information sharing among the services • IT communication allows sharing of information to generate richer awareness for policy generation.	• iTrent, helps HR manages to communicate with rest of the organisation efficiently. • Effectives policies are generated through effective communication between the resident and LGAs.	• Admission module shares new policies, changes to policies with residents and associated organisations. • Policy makers considered Share-point for collaborative work and information sharing.
	Information processing (IP)	• Large number of employees necessitates adopting IT for IP and Agresso is used for finance, HR and payroll purposes. • IT IP is needed to process enormous influx of information coming from residents and staff.	• Due to high information intensity LGA_B adopted iTrent to process HR information. • Policy manager views IT as means to process large information, gathered through consultations and research conducted to generate public policies.	• With limited number of staff members and high volume of admissions applications, IT is adopted to process information efficiently. • Information is processed to generate informed policies.
	Process structuring	• Control and automation of processes in LGA_A's finance department is achieved through Agresso systems. • For better control and sharing of information policy making process requires IT support.	• iTrent allows access to information from multiple sites, collaboration and a control mechanism for HR service activities. • PMP requires automated mechanism to qualify participants for consultation and routing information.	• One of the major functions that workflow is adopted for is automatic routing of admissions information to parents and relevant people. • To save cost and time policy makers seek solutions to automatic routing of information and control.
TTF	Fit	• Final decision lies on how well a solution meets the need of the organisation	• Technology that meets task requirements with relative advantage will be adopted	• Technology appropriateness to task requirements creating value for money.

Table 6.2: Cross-case synthesis of functioanl perspective factors (TTF)

6.2 Revised Conceptual Framework

This chapter modifies initial conceptual framework based on the cross case analysis and discussion in section 6.1. The conceptual framework in section 3.3 has been revised and illustrated in figure 6.1, with a detailed discussion below.

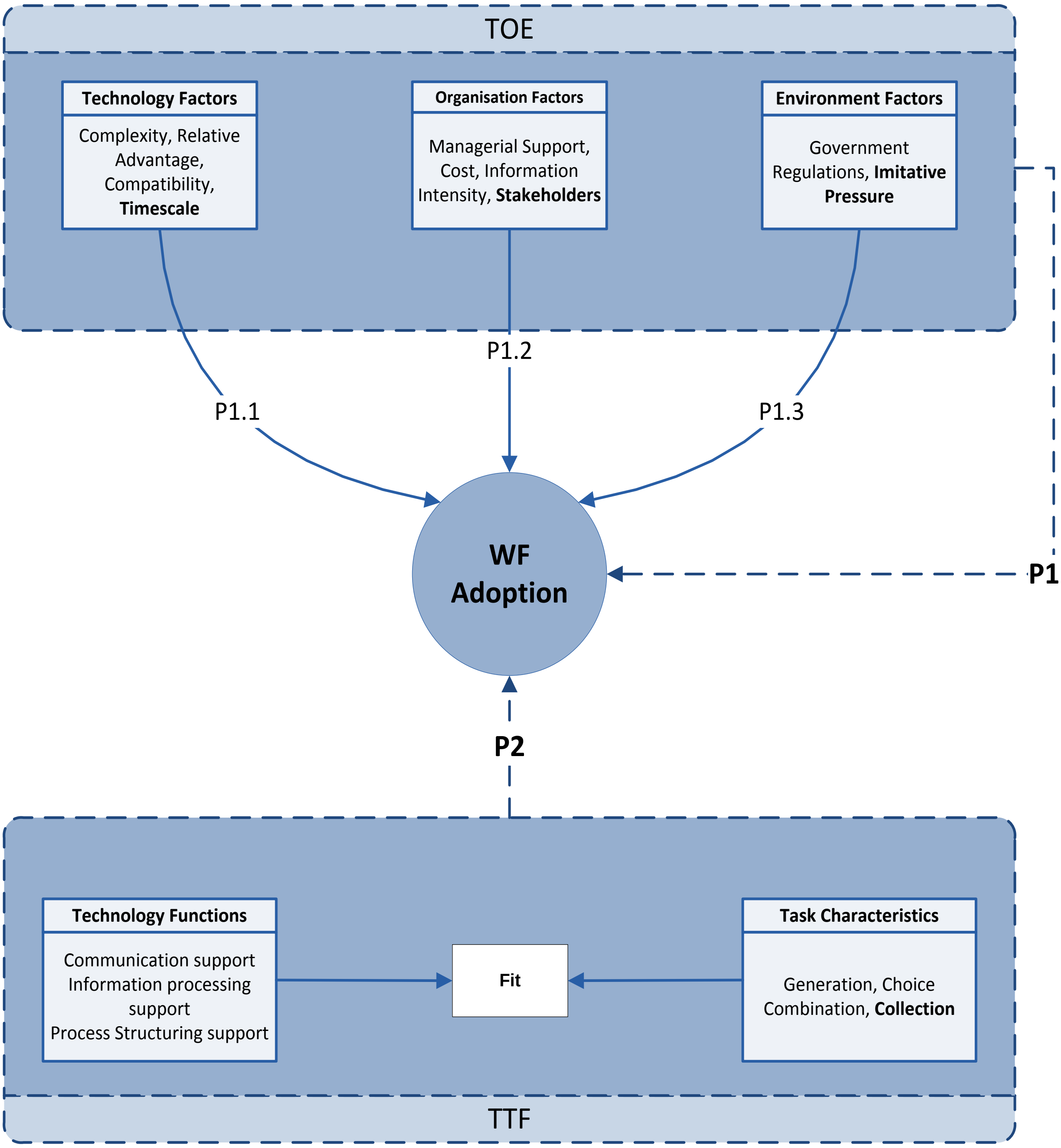

Figure 6.1: Revised workflow technology adoption framework

The revised conceptual framework provides a holistic understanding of the WfT adoption in LGAs. It identifies the contextual and functional factors that influence WfT adoption. Figure 6.1 suggests that the decision to adopt workflow technology is influenced by the sets of Technological, Organisational, Environmental factors and Task Technology fit Characteristics. The revised framework adds some new factors (in bold), which were revealed by the empirical data and some factors from the literature (Organisation structure, attitude, competition), which have not been confirmed through empirical findings are removed from the framework.

Firstly, components of technological factors are complexity, compatibility, relative advantage and timescale. Complexity has a negative impact on decision-making. WfT will be adopted readily if there are fewer complexities, which means less training cost and faster implementation of the technology. The greater the compatibility and relative advantage of WfT, the faster it will be adopted due to its value for money and efficiencies. Timescale emerged as an influential factor from the empirical data. A longer time for WfT to be implemented has a negative influence and it will impact on the decision to adopt. Hence, proposition 1.1 in the chapter 3, has been revised as below:

P1.1 Greater compatibility, relative advantage and lesser complexity and timescale will influence positively decisions to adopt workflow technology in policy making context.

The set of the organisational factors is revised after the cross case analysis with organisational structure and attitude not conforming to the empirical evidence and stakeholders as an emerging factor. Managerial support, information intensity and cost remain within the framework due to conformity with the data and the literature. Organisational structure did not have any influence over the decision making in the three cases due to organisational flexibility and department based budgeting policy of the LGAs. Decision making of IT adoption is independent of organisational hierarchy and bureaucratic structure, which were more prevalent in the past. On the other hand, cross case analysis suggests that a negative attitude can create resistance to change, which is countered with managerial support and effective communication. Necessary training is provided to the staff members so they are able to use the system effectively by increasing IT efficacy and the benefits of the WfT are communicated through project champions. Organisational factors influence the decision to adopt WfT in the policy making context and after the cross case analysis proposition 1.2 in chapter 3 has been revised.

P 1.2 Managerial support, information intensity, stakeholders and low cost will have positive impact on the decision to adopt WfT in policy making context.

The third set with a contextual perspective is the environmental factors, which was also revised after the cross case analysis and discussion. Competition could not be confirmed through the empirical data and cross case analysis suggested that competition does not exist among the LGAs on departmental levels. Services do not compete on providing information and services to the residents as these LGAs have been allocated to them according to their residential locations. However, imitative pressure emerged as an influential factor after analysis revealed WfT was adopted among the three cases due to imitative pressure. Government regulations were found to have an influence, as proposed in the initial conceptual framework, and evidence from the empirical data also supported influential characteristics over decisions to adopt WfT. Proposition 1.3 in section 3.2.1.3 is revised due to emerging and non-conforming factors.

P1.3 Government Regulations and imitative pressure has positive influence over the decision to adopt workflow technology in policy making context.

Factors of Task Technology Fit were also revised after the cross case analysis and discussion was conducted in section 6.1.1.5. Task characteristics were found to be generation, choice, collection and combination with collection as an emerging characteristic of tasks in both the services and the policy making context. From the cross case analysis and discussion it is understood that collection of information exists in LGAs at high levels and it is one of the tasks in LGAs that exists in every department of the organisation. Information is collected from within and from outside the organisation on a regular basis to be used for other activities. Together generation, choice, collection and combination of either task characteristics play an important role in defining the fit of WfT's functions, which leads to an influence on the decision to adopt WfT.

The set of technology functional characteristics is comprised of communication support, information processing support and process structuring support. These dimensions of WfT were proposed in the initial conceptual framework and evaluated among the three case studies. Cross case analysis identifies the three functions of WfT to be vital to serve the task characteristics and fit for purpose. Fit is important to exist between the task characteristics and technology functions which will generate value for money, efficiency and relative advantage. Fit has a positive influence over WfT adoption in LGAs. Decision makers from service departments evaluate potential technology by assessing its ability to serve the task requirements, similarly, policy makers expressed their decision making relating to WfT that if technology functions match policymaking activities it will create a positive impact on the decision to adopt. Cross case analysis revealed that communication support fits to serve generation and collection tasks, Choice tasks require both communication support and information processing support and lastly, the combination characteristics of task are best served by the combination of the three functional supports of WfT. Hence, proposition 2.1 in section 3.2.2 is revised below:

P2 Fit between task characteristics (generation, choice, collection and combination) and WfT functions (communication support, information processing support and process structuring support) influences the decision to adopt WfT in policy making context.

6.3 Workflow Technology Adoption Tool for Policy Makers

This section focuses on acknowledging the similarities between the task characteristics of the service departments (Finance, HR, Admissions) and policy making to propose a WfT framework as a recommendation tool for the public policy making department in LGAs.

A generic process of policy making can be applied to different policy domains and in different countries. Tasks in a generic PMP show common constructs present in most policy making processes that have been identified. First, the review of the literature selected the Macintosh model as a generic policy making process in Section 2.2.3.4, which contains common stages found in the most commonly mentioned models in the literature. Secondly, common stages have been abstracted from two real world policy making process scenarios in the UK and Turkey, which was presented in the study by Lee *et al.*, (2011) and from the empirical data collected from the three case studies in this research. Different stages and tasks have been abstracted from the study and empirical findings to develop a flow diagram of policy making process, which is presented Figure 6.2.

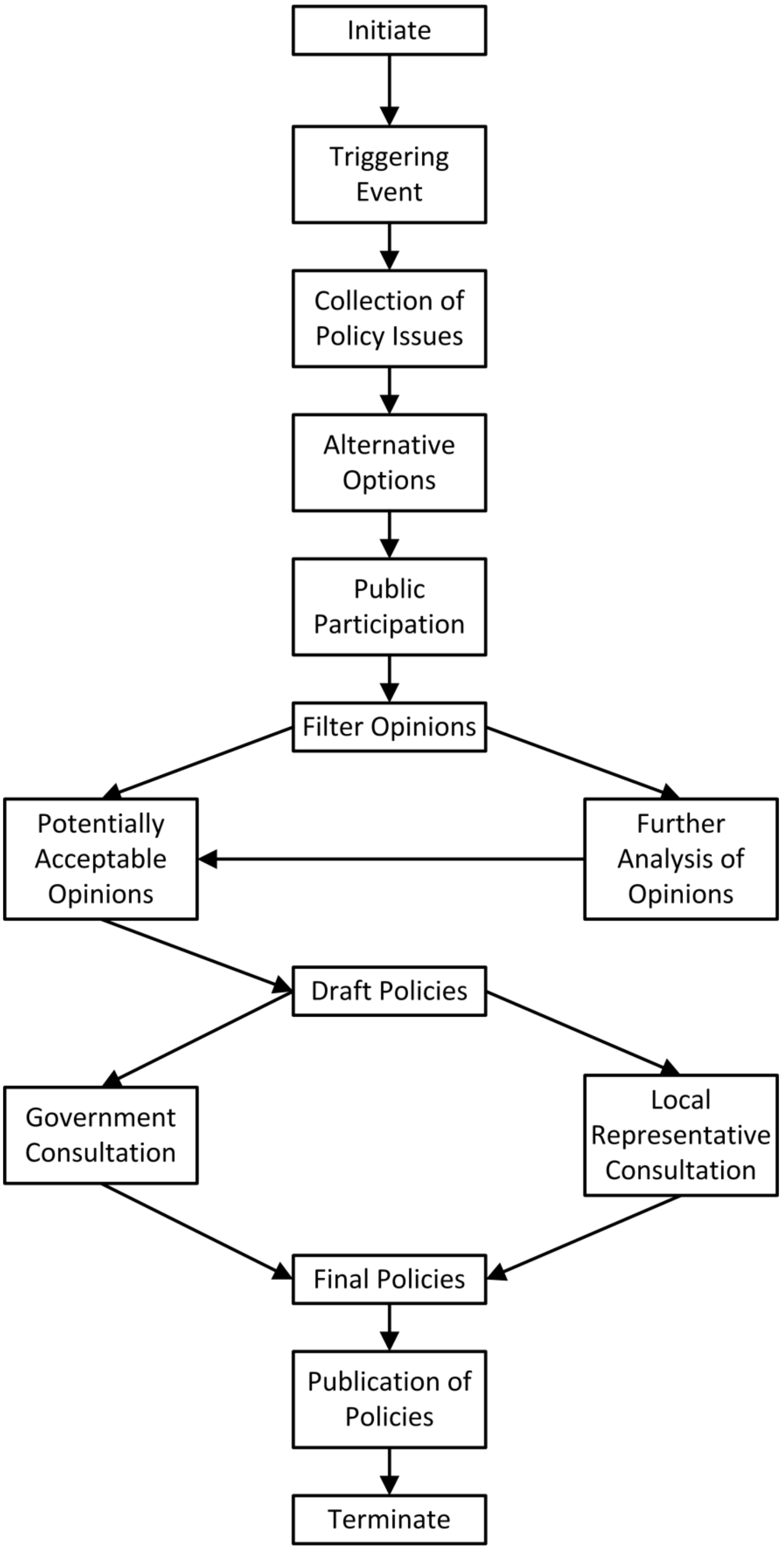

Figure 6.2: Generic policy making process

1. In the generic policy making process, there is always a triggering event that initiates the process. The policy makers can initiate the trigger or it can be initiated

by the public. Policy issues are gathered by different means that could imply, collecting issues from citizens or by deciding in a boardroom.

2. Following this, alternative options are designed for policy issues and presented to citizens for public consultation. Public consultation can take place through different mediums, such as traditional methods of meetings or through electronic media. In public consultation there are conditions which decide who will participate and provide their opinion.
3. Next, these collected opinions are filtered out into potentially acceptable opinions or opinions that require further analysis.
4. Opinions are turned into draft policies, which are again put forward for consultation. However, this time consultation takes place in two domains. One that has government representatives and other where local representatives provide their opinion on draft policy. This way both institutional and local citizens' views are taken into consideration before policies are finalised.
5. Lastly, polices are published for public access and implemented.

The above tasks highlight four important characteristics of all the tasks involved in the policy formulation process that were also found in the empirical findings of this study; generation, choice, combination and collection. First three characteristics of the tasks have been adopted by Dennis *et al.'s* (2001) study, where the authors presented and empirically tested a Fit Appropriation model for Group Support Systems. The authors extended TTF model by adding an appropriation construct to study the impact on process whereas the TTF model was used to study impact on outcome effectiveness. Among the task characteristics defined, generation was referred to as producing ideas and alternatives. This attribute can be replicated for producing alternatives for policy issues in task 2, producing draft policies in task 4 and generating policies in task 5 above. All the decision-making tasks were represented by choice characteristics. For policy making processes all the tasks performing selection, filtration and decisions have been characterised by choice, task 2 and 3. The authors also made a combination of characteristics for those tasks that have both elements of decision and generation. In this study task 2 is a combination task as policy options are generated and filtration of those participants are conducted who will be providing their opinions. However, one more characteristic of task needs to be added for the policy making process and that is collection. It refers to all those tasks that perform collection of opinions and issues in policy making process. Hence it can be concluded that the policy making process has four main task characteristics that are generation, choice, combination and collection. These are illustrated in table 6.3 below, with respect to Macintosh's policy making cycle (2004) that further ascertains ascription to policy making tasks.

Macintosh stages	**Tasks**	**Characteristics**
Agenda setting	Gathering issues to establish a need for policy or generating ideas	Collection/Generation
Analysis	Analysing alternative options and generating initial policies	Combination
Policy creation	Policies are finalised after a decision is made	Choice
Implementation	Policies are published	Generation
Monitoring	Reviewing of policies in action	Combination

Table 6.3: Policy making task characteristics

The first stage in the process is of agenda setting which involves task activities that are collecting information from the citizens and policy makers to produce potential options for setting a policy agenda. These activities demonstrate task characteristics of collection and generation. Analysis is the second stage that picks options from the previous stage, carefully looking for possible policies and generating initial policies for the next stage in the process. Analysis is a combination of collecting raw data, making decisions and generating output for the policy creation stage. Therefore, it can be seen as a task with activities having multiple characteristics. Policy creation, as the name suggests, is the stage where policies are created and finalised. The major activities involved are decision making, which classifies choice as task characteristic. After policies are finalised they are ready to be implemented, therefore, policy makers publish these polices for the public. As publishing is an activity of producing information that identifies generation as a task characteristic of the implementation stage. Lastly, monitoring is a stage in the policy making process that is responsible for reviewing all of the published policies. The tasks entailed in this stage perform multiple activities such as collecting feedback, analysing and taking decisions to continue with polices or withdrawing them at this stage. Hence, there are a number of activities involved in this stage and a mix of task characteristics such as choice, generation and collection.

The policy making process is no different from any of the services in LGAs, considering the major task characteristics and WfT functions perceived by the participants. As mentioned in chapter 2, policy making is information intensive, with sets of sequential tasks, roles, specific activities and information processing to turn input into output. Hence, the information intensive nature of the policy making requires IT support such as communication and coordination (Lee *et al*., 2010; Lindblom, 1959). Role specific activities suggest that WfT's process structuring support defines the working process between the group of workers through routing, qualifying and adding task completion conditions will benefit the policy making process.

Table 6.4, illustrates the similarities between the service (Sr) and policy making (Pm) departments in LGAs. It provides the definitions of each of the characteristics of tasks and presents participants' quotation references (Chapter 5) from the three case studies as evidence for the characteristic.

Data analysis demonstrates that generation is a task characteristic, which exists in the policy making process. For instance, policy makers among the three case studies expressed sharing information about new, or changes to, policies with the residents, relevant organisations and the members of council are a common practice. This activity of sharing information to generate awareness, ideas and options is generally present in corporate services where information is sent out by the HR or Payroll department on any changes to working conditions within the organisation and service departments to inform residents of any news relating to services they use. Next, choice is a task characteristic, which is generic in nature and is active throughout the organisation. Policy makers are analysing and making decisions to select policies from a pool of alternatives. Similarly, service departments have to filter out relevant information provided by the employees and residents to make decisions affecting applicants' requests. Collection is a task characteristic found in the initial stages of policy making such as consultation and agenda setting. Likewise, the service departments collect reimbursement claims, holiday requests, sick leaves, and annual reviews from the employee of the organisation. Lastly, combination of task characteristics exits in policy making analysis and monitoring stages (table 6.4). It not only selects initial policies but also shares them with the decision makers. Hence, both choice and generation characteristics of task exists. Replication of this scenario is present in the service departments. In the admissions department, requests of preferred schools are collected from the residents, after selecting school options it is shared with the admissions managers to endorse decisions. In this example, both the collection and the generation characteristics are left out.

Factors		Definition	LGA_A		LGA_B		LGA_C	
			Sr	Pm	Sr	Pm	Sr	Pm
Task characteristics	Generation	Task activity responsible to provide information.	Ref. 29	Ref. 30	Ref. 61	Ref. 62	Ref. 93	Ref. 94
	Choice	Making selections, analysing alternative options and making decisions.	Ref. 31	Ref. 32	Ref. 63	Ref. 64	Ref. 95	Ref. 96
	Combination	Task activity that combines two or three of the task characteristics.	Ref. 33	Ref. 34	Ref. 65	Ref. 66	Ref. 97	Ref. 98
	Collections	Task activity that gathers information from different sources.	Ref. 35	Ref. 36	Ref. 67	Ref. 68	Ref. 99	Ref. 100

Table 6.4: Similarities between the tasks characteristics between the two processes.

Considering the elaboration provided above, it can be stated that policy making tasks share similar characteristics as service departments in LGAs and the application of the WfT adoption framework to the policy making context will render similar results. Therefore, this study advocates the appropriateness of the WfT adoption framework for policy making which will benefit the decision making process and identify important influential factors.

The workflow technology adoption framework presented in section 6.2 provides the significant factors that influence decision making in a LGA. Data collected from the three case organisations revealed that workflow technology is useful.

6.4 Conclusions

This chapter presented findings from the cross case analysis and discussion. Three case studies were undertaken in this research to investigate factors influencing WfT adoption in policy making context revealed two important perspectives, the contextual and the functional level. From the contextual perspective TOE theory was adopted in chapter 3, which after analysis of the data revealed a set of factors belonging to Technology, Organisation and Environmental factors that influence decisions to adopt WfT in LGAs. Secondly, Task Technology theory was adopted and proposed factors belonging to the set from the literature were evaluated among the three LGAs which confirms that WfT functional fit with LGAs task requirements will influence positively decisions to adopt WfT. Task Technology Fit was also used in this research to highlight the similarities between the task characteristics of policy making and services in LGAs to support the WfT adoption recommendation framework for decision makers in the policy making context. To conclude, chapter 6 presented findings showing that WfT adoption is effected by five main sets of factors: Technology, Organisation, Environment and Fit between Task and Technology and the revised framework in section 6.2 is novel in terms of the following:

- According to the literature discussed in chapter 2 (section 2.7) and chapter 3 (section 3.11), there is a lack of an empirical framework to evaluate workflow technology adoption. The conceptual model presented in this chapter fills the gap by revising the initial framework presented in chapter 3, based on the cross case analysis of empirical data collected from the three case studies. It increases understanding of the adoption factors affecting workflow technology adoption.
- From the literature (chapter 2 and 3), table 2.16 and 2.17 compile a comprehensive list of factors affecting the adoption of IT. However, new factors emerged from the data analysis in chapter 5 from the three case studies. Consequently, adding more factors to the existing literature and contributing to the development of the revised conceptual framework for the workflow adoption model.
- The literature suggests that there are insufficient studies classifying WfT functional attributes and policy making task characteristics. The novel framework of WfT adoption also classifies policy making task characteristics into four major tasks (generation, choice, collection and combination) and workflow technology functions into three major functions (communication support, information processing support and process structuring support). The development of these classifications would increase knowledge for both researchers and practitioners indicating further study of policy making and WfT in different research areas to analyse varied impacts in various contexts.
- The framework holds practical implications by acting as a recommendation tool for policy makers to understand different factors effecting decision to adopt WfT.

The next chapter presents a general summary of each of the chapters in this study, discusses contributions of the research, elaborates on the limitations confronted and provides suggestions for future work.

CHAPTER 7: CONCLUSIONS, CONTRIBUTIONS, LIMITATIONS AND FUTURE WORK

7.0 Introduction

The preceding chapter presented the cross case analysis and discussions that led to the research findings. Based on these findings a revised conceptual framework for workflow technology adoption was presented and conclusions have been drawn for this study. The discussion highlighted five new factors from the empirical data that have influence over workflow technology adoption and three proposed factors from chapter 3 were removed from the revised framework.

Chapter 7 is the final part of the thesis which summaries the overall research and the key findings in section 7.1. The next section, 7.2, discusses the research contribution and implications for theory, methodology and practice. In section 7.3, the chapter presents limitations of this research and avenues for future work. Lastly, section 7.4 provides the conclusions of the chapter.

7.1 Research Overview and Key Findings

The thesis aims to provide decision-makers in the public sector with a set of factors, from contextual and functional perspectives, that play an important role in influencing decisions to adopt workflow technology. In doing so, the thesis develops and evaluates the conceptual framework as a recommendation tool for workflow adoption in the policy making context. The following paragraphs summarise the major points from each chapter presented in this thesis.

As presented in chapter 1, the study presents an overview of the research background and highlights the research problem. Efficient business processes lead organisation to success and are seen as an important success factor for any organisation. Both the private and public sectors adopt WfT for modelling business processes and to automate tasks, which reduce cost, achieve benefits and gains run time efficiencies. However, there is a gap in the literature and a significant lack of workflow technology adoption in practice when it comes to policy formation. This gap is highlighted in chapter 1 and a potential solution has been presented. Most of the literature on workflow technology is limited to its design and implementation and empirical research on workflow adoption has been neglected so far. There is scarce knowledge on workflow technology from a socio-technical and organisational context, which creates an academic challenge. Hence, the chapter suggests exploring for influencing factors from contextual and functional perspectives that impact workflow technology adoption in public sector. It proposes a recommendation framework, empirically evaluated, to help policy makers make the decision to adopt workflow for policy formulation. In order to do so, the aim and objectives of the research are presented with research questions leading to the direction of the research.

From the aim of the thesis a background theory was developed through a critical review of the literature in the area of policy making, workflow technology and IT adoption theories, that also fulfils the first objective of the research. The extensive review of the literature revealed that workflow technology adoption has many benefits, which have been used by the private sector extensively. The public sector is advancing towards IT adoption and many business processes have been facilitated by workflow adoption through its capabilities of automation and its other benefits. However, the literature shows a lack of empirical research on workflow technology adoption in the public sector. Policy making is a segment that has been slow in IT adoption and workflow technology has been advocated in the literature as an impetus for policy making. A further review of the literature highlighted insufficient empirical research in the area of workflow adoption. Much of the literature on workflow advances knowledge on design, modelling and implementations that leave a gap in the literature about workflow adoption. Review of public policy suggests that immense opportunities exist for workflow adoption to improve policy output, reduce costs and enhance process performance. Next, a critical review is presented of IT adoption at the organisational level and the important theories that help in developing the focal theory of this study. Among the most widely mentioned IT adoption theories TOE and TTF theories are presented as the most appropriate for this study that also helps in identifying factors for workflow technology adoption in chapter 3. Therefore chapter 2 presents the gap existing in the literature, identifies the research problem and provides an in-depth understanding of the background to the research.

From chapter 2 the study identifies a lack of a conceptual framework to help policy makers identify important influential factors affecting decisions to adopt workflow technology. Two important theories for this research identified in chapter 2 lead to the development of a conceptual framework that is empirically evaluated in chapter 5 and revised in chapter 6. This brings objectives 2 and 3 to be fulfilled as identified in chapter 1. It also provides the motivational grounds for the development of the workflow technology adoption framework, considering the two theories have not been applied to workflow technology before which not only aids in identifying influential factors but evaluates the theory in a context that has not been explored before. Two different theoretical lenses provide a holistic view to explore for contextual and functional factors of workflow technology adoption in public sector organisations.

7.2 Research Contributions and Implications

The research study produces a contribution to knowledge and practical implications through the different segments of the study. From chapter 1, 2, and 3 the need for a framework was identified and a conceptual model was produced. The methodology to evaluate the framework and development of case studies was presented in chapter 4. An individual case study was analysed in chapter 5 and to have rigorous evaluation of the findings related to the conceptual framework chapter 6 presented a cross case analysis. Finally, based on the empirical results the conceptual framework was revised and presented in chapter 6. Through the research process spread over the 6 chapters it has produced a novel contribution to the area of workflow technology adoption and expanded knowledge of the area. In the field of information systems it is said that research must have methodological rigor, be theoretically interesting for the academics and should have relevant practical implications for the community (Rosemann and Vessey, 2008; Oates, 2006). The key contributions of the research are explained in the following subsections.

7.2.1 Contribution to theory

This research sought to provide novel contributions and insights into the area of workflow technology adoption particularly in local government authorities. The aim of the research was to identify factors that influence the decision to adopt workflow technology in LGAs.

The core theoretical contribution of the study is the revised framework in chapter 6 for workflow technology adoption in local government authorities. The framework provides a comprehensive and holistic understanding of the factors from the contextual and functional perspectives that impacts workflow technology adoption.

As the literature gap mentioned in chapter 1, 2 and 3 highlights the lack of a theoretical framework for workflow technology adoption and insufficient knowledge to understand what factors influence the decision to adopt WfT. Without enough support from empirical research on workflow adoption in local government authorities it prevents researchers from understanding the phenomenon and keeps practitioners unequipped with the necessary tools to evaluate workflow technology integration. The novel framework presented in chapter 6 addresses these gaps. One of the reasons that can be attributed to the lack of a theoretical framework for workflow technology is that much of the research work has been conducted from the technical side. Researchers have focused mostly on the modelling, verification methods and workflow application systems development perspective (Zhuge, 2003). Hence, this thesis contributes to the background theory by extending knowledge in the area of business process automation. It allows researchers to understand the integration of the workflow concept into public organisations. This framework extends the extant literature on workflow adoption from the organisational behaviour perspective and provides a holistic understanding of influential factors of WfT adoption. Most of the IT adoption theories consider either the behavioural perspective of adoption or functional utility. The framework provides a coherent and holistic understanding by combining the contextual and functional fit perspective to evaluate workflow technology adoption in LGAs complex domain and technology’s functional appropriateness. Combining the two perspectives strengthens the framework by integrating the influence coming from the context of the phenomenon and the fit of the technology with the context. This research extends the two theories as:

- TOE theory: In the context of workflow technology adoption, this research extends TOE theory with new factors from the empirical findings from the three local government authority case studies. By conducting a qualitative research method, the study identifies new factors from the context of the phenomenon through exploration and interpreting the meanings associated with the social entities. Most of the empirical work tests TOE theory in a new domain and through different IT, however, to evaluate and develop the theory further is not been done. The research evaluates and extends the TOE theory by applying it to exploring for factors influencing workflow technology in LGAs. In doing so new factors such as timescale, stakeholders and imitative pressure were found from the data. It also evaluated the factors from the literature and the results revealed that organisational structure, competition and attitude did not have an impact on the decision to adopt WfT. Hence this research extends the theory by developing it further through empirical findings from the three LGA case studies.

- TTF theory: Another theoretical contribution is the extension of task technology fit theory. This research evaluates and develops the theory in a new context of workflow technology and LGA. Previous studies have focused on testing the theory that has strengthen the reliability of the theory, however, to further develop it to meet the needs of the new context and phenomenon is insufficient. Hence, this research contributed by adding collection as a new factor to the theory for the set of task characteristics. The literature has identified generation, choice and combination as characteristics of task which were also confirmed through this study in the Wft adoption domain. The variables identifying the task characteristics have an additional variable that will allow researchers to study the task characteristics with a wider understanding.
- Classification of WfT functions and policy making task: Additionally this research classifies functional characteristics of workflow technology and policy making task characteristics. From the literature review in chapter 2 various functions of WfT were reviewed and classified in section 2.4.3, which has been supported through empirical evidence in this study. Task characteristics for the policy making process was classified through analysing different policy making processes in the literature and identifying a generic process. Furthermore, policy making stages were abstracted from the literature and through empirical evidence that lead to the classification of policy making task characteristics. These classifications can be adopted to further extend the literature in policy informatics, pubic administration and IS.

7.2.2 Contribution to practice

The findings reported in this study have some significant contributions and valuable practical implications for managers in local government authorities and for policy makers as a recommendation tool. Besides huge investments in ICT by the LGAs, as highlighted in section 2.5, there is a significant lack of a recommendation framework that helps in understanding the factors influencing WfT adoption. This study provides a holistic understanding and insights for the decision makers in the LGAs who are responsible for making critical decisions on IT investments. The methodology adopted to evaluate the framework incorporated participants' experience with WfT adoption and the opinions of the potential adopters, which are the policy makers. Hence, policy makers can use the framework to identify key factors influencing decisions to adopt and to be able to make informed decisions.

7.3 Research Limitations

This study provides a novel and significant contribution to workflow technology adoption in LGAs which helps managers take informed decisions and adopt a proactive approach. It also enables academic researchers to further extend knowledge in the area of workflow adoption and policy informatics. Nonetheless, despite of all the contributions and valuable lessons drawn from this research there are some limitations that are worth mentioning and these have been noted below:

- Firstly, this study adopts a qualitative method to collect data and analyse factors of adoption in local government authorities for workflow technology adoption as mentioned in chapter 4. This method allows collecting rich data and deeper understanding of the phenomenon under investigation due to its close association with the organisational and human influence (Bryman and Bell, 2007). However, it has some intrinsic weaknesses, which have been mentioned in the extant literature such as, a possibility of bias in the interpretation of the data given the subjective nature of the research can reduce the strength of the study. However, this study adopted a multi-method approach to collect the data as the triangulation of data collection method, which minimises data bias and generates reliable and valid research findings.

- Secondly, the number of case studies raises generalisation as a research issue. In order to understand the phenomenon under investigation comprehensively, this study focuses on deeper and richer data for abstracting empirical findings. For these reasons the research has been limited to three case studies and focus has been maintained on deeper understanding. The case study method inherits statistical generalisation limitation, however, it allows logical replication of the findings and analytical transferability to other contexts.
- Thirdly, this research collects data from two units of analysis one from the experiences and the other from the opinions of the participants. On the one hand opinions cannot be considered as equally credible as experiences, which have a level of biasness in data collection. However, on the other hand, it strengthens the data by incorporating opinions from the policy makers as complimentary evidence.
- Fourthly, the study does not include factors like corporate culture and consumer pressure in the conceptual framework. The intention of the research is to explore for factors that are relatively easy to evaluate and widely applied in the literature. Initial understanding of incorporating these factors in the framework was to strengthen the content of the framework, however, including them would have made the analysis difficult, time consuming and confusing. This is because these factors are challenging in studying on their own and require in-depth analysis of the structure of the organisations and the external environment.

7.4 Recommendations for Future Work

This study has evaluated and extended current theories (TOE and TTF) by applying a workflow technology adoption framework to a new domain and revising the framework based on the empirical findings. Further refinement and testing of the framework is needed. Hence, there are some recommendations for future work based on this study.

- The task technology fit also suggests cost reduction, superior time delivery, less task complexity, efficient output and user satisfaction as the user is able to perform task activities using the appropriate technology's functions (Lee, *et al.*, 2007). Future research can evaluate the relation between the TTf and TOE factors such as technology functional characteristics with TOE's technological factors (complexity, relative advantage, compatibility and time scale).

- Further research can test the propositions presented in section 6.2 through correlation and regression models to statistically generalise the framework. The qualitative approach could not be applied before the framework was developed which now gives an opportunity to validate, enrich and apply the framework to a wider range of organisations.
- This research only discussed the factors affecting the adoption of workflow technology within a specific context. This leaves an opportunity for future research to understand the adoption process of workflow technology in local government organisations. Investigating the adoption process will add procedural and contextual knowledge which will aid in gaining a deeper understanding of the workflow technology adoption phenomenon with the application of the current framework presented in this study.

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Appendix:

Group A. Interview questions for the people involved in policy-making

Section A: General Organizational Questions

1. The structure of LGA varies in different parts of the UK. However, there are five different types of authorities in England; these are divided into single-tier and two-tier authorities as shown below. According to this structure, what is your status in the overall local government hierarchy?

   Single Tier Authorities

- Metropolitan Authorities
- London Boroughs
- Unitary or Shire Authorities

   Two Tier Authorities

- County Council
- District Council

Other Please specify ________________

2. What are the core businesses of your organization?

3. What type of policies your organization makes?

4. What is the population in your community? (Approximately)

5. How many employees work in this LGA? (Approximately)

6. How many citizen queries does your local authority receive on daily basis? (Approximately)

7. How many citizens (face-to-face) contacts does your local authority receive on daily basis? (Approximately)

Section B: Decision-making

8. Please describe step by step how public policies are made? Explain who are the people that are involved from within and outside the organization for policy formulation?

   ………………………………………………………………………………………
   …………………………..……………………………………………………………
   ……………………………………………………..

   Probes: What are the task characteristics, what form of information is processed and is there any collaborative task involved?

9. Is there any ICT support available for policy making? If yes, please explain how it is used to facilitate the policy making process?
   ………………………………………………………………………………………
   …………………………..……………………………………………………………
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Probes:

10. What are the barriers for IT adoption for policy-making processes?

    ………………………………………………………………………………………
    …………………………..……………………………………………………………
    ……………………………………………………..

11. Please describe, in your opinion, how important is the match between technology's functions and task requirements?

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Probes:

12. Who are the people involved in IT adoption decision-making process for policy-making department?

    ………………………………………………………………………………………
    …………………………..……………………………………………………………
    ……………………………………………………..

13. Are there any evaluation criteria for adopting new technologies? If so please explain.

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Probes:

14. What factors in your opinion influence decisions to adopt new technology in policy-making domain?

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…………………………..……………………………………………………………
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Probes: technological, organizational, and environmental

15. What are the main factors influencing decisions to adopt IT in policy making department? (Please indicate all that implies)

	No influence			Most influence
Factors	0	1	2	3
Special IT skills required for using new technology				
Benefits from adopting the IT				
Compatibility with existing systems				
Top management support				
Organizational structure				
Employees' readiness to use new IT				
Reliance on IT for processing large information data				
Government mandates				
Other:				

16. Some Local Borough Councils, which have performed reasonable progress in IT adoption, impact your organisation's decisions toward accelerating the implementation of IT in order to remain competitive? If yes please explain.

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17. How do you see use of automation technology for policy-making processes?

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18. What are the main automation functional benefits you think are important from policy-making perspective? (Please indicate all that implies)

Not important				Most important
Functional benefits	0	1	2	3
Role resolution				
Collaboration				
Control				
Coordination				
Monitoring				
Information processing				

Group B. Interview Questions for IT head & IT team

1. Workflow technology is used to automate business processes. Some software examples adopted by councils around UK are iTrent systems for recruitment, EDRMS (electronic document and records management systems), ReadSoft Forms/ CLASSIFY & INDEX for handling paperwork, PARIS IT Systems… Can you please list some of the workflow-based software used within the council?

No.	Technology	Function
1		
2		
3		
4		
5		
6		
7		

2. Could you please pick one of the workflow-based software and describe how it facilitates the organizational process? Please describe the organization process in terms of what are the stages, roles and activities taking place in the process and then how workflow technology is providing functional facilitation?

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3. Who initiated or supported the idea for adopting such a technology?

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4. What were the main reasons/motivation for adopting such technology?

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5. What were the barriers for adopting such technology?

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6. Who are the people involved in IT adoption decision-making process for the council?

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7. Are there any evaluation criteria for adopting new technologies and specifically workflow technology? If so please explain.

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8. What factors in your opinion influence decision to adopt workflow based technologies for the council?

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Probes: technological, organizational, and environmental

9. What are the main factors influencing decision to adopt workflow-based technology? (Please indicate all that implies)

	No influence			Most influence
Factors	**0**	**1**	**2**	**3**
Special IT skills required for using new technology				
Benefits from adopting the IT				
Compatibility with existing systems				
Top management support				
Organizational structure				
Employees' readiness to use new IT				
Reliance on IT for processing large information data				
Government mandates				
Other:				

10. Some Local Borough Councils, which have performed reasonable progress in workflow adoption, impacts your organisation's decision toward accelerating the implementation of Wf in order to remain competitive? Please NO justify.

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11. What are the main automation functional benefits you think are important for business process? (Please indicate all that implies)

	Not important			Most important
Functional benefits	**0**	**1**	**2**	**3**
Role resolution				
Collaboration				
Control				
Coordination				
Monitoring				
Information processing				

Group C. Interview questions for Users

1. Please describe the business process you are involved in?

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   Probes: What are the task characteristics, what form of information is processed and is there any collaborative task involved?

2. Please describe how important workflow technology (software ABC) is in assisting your daily activities?

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3. Please describe, in your opinion, how important is the match between technology's functions and task requirements?

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4. What functional benefits do you seek from workflow technology for your daily tasks?

	Not important			Most important
Functional benefits	**0**	**1**	**2**	**3**
Role resolution				
Collaboration				
Control				
Coordination				
Monitoring				
Information processing				
Other:				