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The Development of a Framework on Information Behaviour of

SME Managers When Adopting Emerging ICTs

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Dedication

This thesis is dedicated to God Almighty for his guidance, the first teacher that thought me into life and my family for their support and encouragement. And to the memory of my late father, who died during this programme.

Acknowledgements

Firstly, I will like to express my deepest gratitude to one of my academic supervisors Professor Yanqing Duan for giving me this opportunity to do this study. Secondly, my supervising team, Dr Yongmei Bentley – my director of studies, Professor Yanqing Duan and Dr Vincent Ong for their encouragement, patience, advice and guidance throughout my journey for this MPhil.

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Abstract

Uncertainty and complexity related to emerging ICTs and unpredictable technology changes have put pressure on firms' knowledge to gather, seek and scan the environment for information during their emerging ICT adoption decision-making process. Furthermore, unstable environment, changing government policy on information technology has contributed to, as well. Also, emerging ICTs have unlocked different and new opportunities and challenges for small businesses as well as open them to uncertainties and risks and their larger counterparts as well. As a result, information becomes significant during adoption decision-making process when adopting emerging ICTs, especially in SMEs because of limited resources. Even with the broad research and literature on adoption decision in SMEs, there is still limited research related to the information behaviours of SME owners when adopting emerging ICTs and factors that influence their information behaviours regarding information sources selection during this process. Therefore, the aim of this research is to explore the information behaviour of SME owners during the adoption decisions when adopting emerging ICTs. To advance our understanding in information behaviour when adopting emerging ICTs and show how SME managers can reduce uncertainty related to emerging ICT.

This study is interpretive qualitative research, and semi-structured and unstructured face-to-face interviews were conducted with twenty SME owners from UK service sector to achieve the objectives of this study. The interviews were recorded with the permission of the participants and the recordings were transcribed. Myers and Newman's (2007) guidelines for qualitative interview research were used as a guide for the interview process and triangulation methods for the research rigour and quality. Nvivo 10 is used for data analysis.

SME managers' information needs, information seeking behaviours; and their information sources were explored; factors that influence their information behaviours were identified through empirical data using technology organisation environment model as theoretical underpinning.

The results demonstrated the importance of information and seeking information on the emerging ICT during adoption decision-making. This study contributes to the development of knowledge and practice in numerous ways. The study proposed a conceptual framework that

shows information behaviours of SME owners during emerging ICTs adoption using TOE model as a theoretical underpinning and the framework was validated using triangulation methods. The research findings also explained the contexts of technology, organisation, and environment as information behaviour trigger and perceived information needs during the adoption decision-making process in SMEs. This research contributes to the improvement of knowledge and practical at different stages. Theoretically, the study has taken academic research forward in the research area of information behaviour and ICTs adoption in SME in service industry using TOE model as theoretical underpinning. SMEs could use the practical contribution of the research result in the service industry in the UK, and any SMEs which are based in a related economy and environment, to have better information about emerging ICTs during adoption decision-making process. These findings gave further insight into IT adoption in SMEs through information behaviours and highlighted the significant of sources of information and pre-information gathering, and the factors that influence information sources such as herd event, information usefulness, and perceived information sources credibility during the decision-making for adopting emerging ICTs

Keywords Information behaviour, Information search, Emerging ICTs, Small and medium enterprises

Author's declaration

I declare that this thesis is my own unaided work. It is being submitted for the degree of Master of Philosophy at the University of Bedfordshire.

It has not been submitted before for any degree or examination in any other University.

Name of Candidate: Sulaimon Olatunji

Signature:

Date: 14/07/16

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CHAPTER 1 Introduction

This chapter describes an overview of this study. Firstly, Section 1.1 introduces the issue, while Section 1.2 is the motivation for conducting research in SMEs in the UK. Section 1.3 covers the scope of the study. Section 1.4 discusses previous studies and the research gap. Section 1.5 provides the Research Aim and Objectives and Section 1.6 presents the Research Questions. Finally, an overview of the thesis structure is shown in Section 1.7.

1.1   Introduction

Emerging ICTs have brought massive changes in how we communicate and do business, including paying our bills, storing our data, and accessing them. It has also provided SMEs with unprecedented opportunities to compete with larger firms; fundamentally, levelling the playing ground and making it possible for SMEs to compete with larger companies without being constrained by geography, market size, technical know-how, or human and financial resources. Furthermore, use of innovation is indispensable for SME business performance and may eventually define their success (Cosh et al., 1998). However, uncertainty and complexity related to emerging ICTs, globalisation, unsettled market environment and unpredictable technology change, have put pressure on firms' knowledge of organisations to gather, seek and scan the environment for information during emerging ICT adoption decision-making process; and a failed ICT adoption decision means doom for SMEs.

1.2   Motivation for conducting research in SMEs in the UK

As SMEs play a significant role in job creation and other related economic activities in the UK; it is expedient to study SME managers' information behaviour during an adoption decision-making process, when embracing emerging information communication technologies (ICTs). According to Ritchie and Brindley (2005), SMEs are responsible for over 65% of jobs in the European Union as well as 59% of GDP; the total number of SMEs in the European Union amounts to 18 million. In a similar report by Rhodes (2014) published by the UK parliament, there were 4.9 million businesses in the UK, 99% of which were SMEs employing 1-249 people. Of this 4.9 million, about 4.7 million are micro-businesses (representing 95%) which account for 32% of employment. But researches have been done on barriers and challenges in SMEs when adopting emerging ICTs. Figure1.1 shows

identification of both internal and external challenges encountered in SMEs during ICT adoption process which can lead to them to seek for information or scan the environment.

External Barriers

| Lack of understanding of SME needs | No common technology standards | E-competence of industry sector |

⇓   ⇓

SMEs

⇑   ⇑

| Identification of benefits | Global trading | Financial constraints | Supply chain integration | Understanding of e-environment |

Internal Barriers
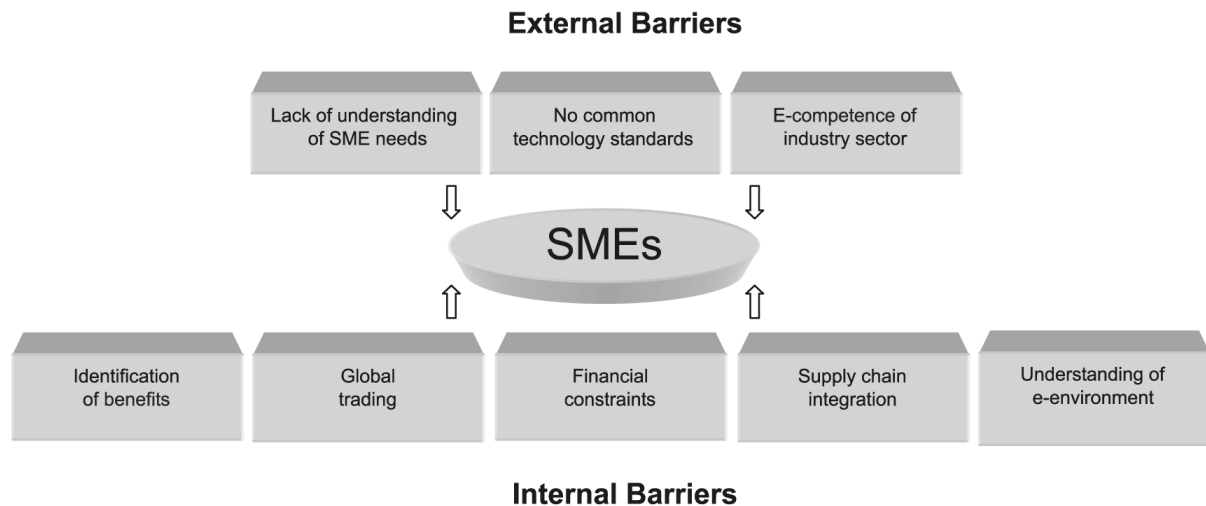
Figure 1.1: Internal and external challenges in SMEs

Source: Stockdale and Standing (2004)

Stockdale and Standing (2004) stated that the electronics environment intimidates SMEs and advancement of information systems: for instance, electronic marketplaces remain unknown to SMEs, and competitive environment is another problem identified by them. In addition to this, some of the barriers and challenges identified in the literature reviewed are, financial constraints, lack of awareness about emerging ICT, benefits on the part of SME managers, lack of technology and training skills, risks and security concerns, lack of monetary benefit of emerging ICT, lack of understanding the significant of ICT in their business, lack of resources to adopt ICT, lack of innovativeness and understanding of ICT. Ambiguity and uncertainty still exist concerning the benefits and unaware of current government policy at the regional, national and European levels, proposed to help them in their implementation and use of ICT (Wilson, 1981, Timmers and Glas, 2010, Khajeh-Hosseini et al., 2012). As a result, information on both the internal and external environments of the organisation is essential during the decision-making process for the management of the business (Citroen, 2011). Also, decision-making process on information communication technology (ICT) adoption is complex due to the lack of proper information on the benefits of the emerging technology. The unfamiliar on the experience new technologies can also affect its adoption (Griffith, 1999). Daft and Lengel (1986) stated that two complementary forces influence

information process behaviours; they are equivocality and uncertainty in decision-making. As a result of this, many information systems failed implementation because they failed to address the issues of uncertainty and equivocality on time (Kydd, 1989). On the other hand, the limited size of SMEs regarding human resources and capital limits the extent to which they can make use of internal team or external professionals when needed for multifaceted technical decisions (Culkin and Smith, 2000).

Furthermore, Consoli (2012) highlighted the factors and rationales why SMEs have not fully exploited the benefit of ICT, unlike their larger counterparts. These factors are financial difficulty, getting loans from the bank and other related financial associations that hinder their investment decision in ICTs. SME as a sector lacks the capacity to train their staff and did not have qualified staff to do that; which can be a setback in SMEs and affect the implementation of emerging ICTs. Hence, information gathering, needs and acquisition become an essential behaviour for SME managers during adoption decision-making process; because making effective decisions is an enormous task for executives and a crucial aspect of their managerial responsibilities (Duan et al., 2012). The barriers and challenges SMEs faced during the adoption decision-making process: consist of both internal and external environment, from the technology itself, and from the organisation context. These facilitated the use of the Technology Organisation Environment framework (TOE) by Tornatzky et al. (1990) as a theoretical underpinning model for this research. Thus having information on this three Technology Organisation and Environment will increase the success and implementation of emerging ICTs in SMEs.

1.3   Scope of the research

Although many scholars had done research on adoption decision-making and IT adoption in SMEs, there is a gap to fill in information behaviours of SME managers during adoption decision-making process. Therefore, it is the intention of this research to fill this gap and contribute to the literature in this area by exploring and understand information behaviours of SME managers in the UK. As a result, the research aim is to explore information behaviours of SME managers during adoption decision-making process when adopting emerging ICTs. This research will focus on information behaviours of SME managers not the adoption decision aspect of it. A better understanding of information behaviours of SME managers will increase successful implementation and raise awareness of emerging ICTs in SMEs. Because

of the time constraint and to manage the research properly this study is limited to SME managers in England in the services industry, not the entire UK.

This study considers the number of the workforce as the standard in determining whether a firm is eligible as an SME and other classifications by the European Union. An in-depth interview as a research instrument. More useful data collected by allowing them to express their views without restraint, this allows to collect more data and develop the theoretical framework through the data collection. The growing rate of information around us makes it difficult to filter which information can help us to make a decision and resolve our issues. The time spent on seeking for information continues to increase, which has financial implications. As a result, this study research on factors that influence information sources and information use of SME managers when making decisions on adoption of emerging ICTs.

1.4   Current Gap in literature

Firstly, evidenced from the literature reviewed shown that researchers have discussed numerous ICT adoption and decisions in SMEs. These studies focused on drivers of ICT adoptions and factors that influenced ICT adoptions in SMEs. For more examples, on emerging ICTs in SMEs, on cloud computing adoption decision in SMEs (Alshamaila et al., 2013, Daneshgar et al., 2013, Gupta et al., 2013). ICT adoption in SMEs (Dwivedi et al., 2009a, Martin and Matlay, 2001, Nguyen et al., 2015, Ghobakhloo et al., 2013) on e-commerce, the Internet, and other ICTs (Daniel et al., 2002, Simpson and Docherty, 2004). There is very limited research to determine information behaviours of SME owners during adoption decision-making process.

Secondly, similar research has been carried out on different information behaviours of people and groups. Some focused on one part of the information behaviour. Such as, information sources (Agarwal et al., 2011), environmental uncertainty and scanning behaviour of top-level hotel executives (Jogaratnam and Wong, 2009), choice of information source (Yunjie et al., 2006), CEO information sources and environmental scanning (Auster and Choo, 1993), student information behaviour (Ole Pors, 2008); and information behaviour of women (Urquhart and Yeoman, 2010) All these studies appeared to have ignored exploration on how SME managers seek, gather and use information during the adoption decision-making process. There is limited research to determine factors that information sources selection during this process.

Summarising, the issue of information needs and seeking seems to be a largely ignored topic in the area of information behaviours research during adoption decision-making process in the in SMEs. Therefore, this study aims to fill this gap by exploring and understanding information behaviours of SME managers and factors that influence their information behaviours when making adoption decisions. These and other gaps found in literature informed the decision to research on information behaviour and factors that influence this behaviour using technology organisation environment framework as a theoretical underpinning in the quest to understand information behaviour of SME managers during the adoption decision-making process.

In doing so, this would help SME managers overcome the time spent seeking for information and improve their information seeking behaviours. According to De Saulles (2007) on information literacy of SMEs in the UK and USA, the research findings show that UK SMEs wasted over £3.7 billion in 2005, in terms of time wasted through inefficient use of the Internet as a research tool. In line with the recommendations of Johnston et al. (2007) and Yang and Fu (2008) that new research that investigate factors that influence SME managers' information behaviour and there should be a new theoretical trend on adoption-decision making process within SMEs.

1.5   Research Aim and Objectives

The extensive literature review on information needs, seeking, environmental scanning, and relevant theories on factors influencing decisions on emerging ICT adoption, highlighted gaps in the literature, provides the rationale for the research questions, rationale for this research aim and objectives including interview questions.

1.5.1   Aim
The overall aim of this research is to propose a conceptual framework on information behaviours of SME managers when adopting an emerging ICT.

1.5.2   Objectives
(1)   To investigate and identify the currently perceived information needs that trigger information behaviours of SME managers relating to emerging ICTs during adoption decision-making process.

(2)   To explore and determine the sources of information on emerging ICTs in SMEs.

(3)   To explore the essential, influential factors on sources of information selection when adopting an emerging ICT in SMEs

(4)   To propose an information behaviour framework on SMEs information behaviour when during adopting decision-making when adopting emerging ICTs.

The below research questions detailed in the next section will help to achieve the aim and objectives.

1.6   Research questions
The research questions for this research are as follow:

(1)   How do information needs of SME managers on emerging ICTs trigger their information behaviours when adopting emerging ICTs?

(2)   What information sources do SME managers/owners use when choosing emerging ICTs?

(3)   Why do SME owners use particular sources of information during their adoption decision-making process and what factors influence their selection of information sources?

1.7 Structure of the Thesis

Chapter one provides the introduction to and rationale for the study, research questions and the aim and objectives of this research. It provides the background for the research.

Chapter two presents the comprehensive literature reviewed for this research, on information behaviours, and issues related to information behaviours are discussed. The significance of information is discussed likewise. Theoretical underpinning for this research is also discussed and analysed.

Chapter three explains the theoretical basis of this research. Justification and explanation are provided of the key themes and concepts used in this study and various studies on the theory adopted.

Chapter four presents the research methodology for this study and justification for the research method chosen and the various philosophical research issues. The sampling strategy, unit of analysis, participant profiles, interview guidelines are all discussed in this chapter.

The process by which the research theoretical framework and research method adopted for this study were explained.

Chapter five presents the data analysis techniques used for this research. After collecting the data and conducting the interviews, this explains the process and strategy used in data analysis in this research.

Chapter six presents the findings from the data analysis. The conceptual framework redefined, and the factors that influence SME managers' information behaviours identified.

Chapter seven synthesises the various activities in this study and presents how the aim and objectives of this research we achieved. Furthermore, the research contributions to both theory and knowledge and the research implications presented.

Chapter eight provides conclusions, the research limitations, and future research based on this study.

CHAPTER 2 Literature Review

This chapter presents a summary review of existing literature on such areas as small and medium enterprises (SMEs); information behaviours; needs, seeking, and environmental scanning, and significance of information; and available studies on emerging ICTs' and information behaviour models. Furthermore, as the aim of the research is on information behaviours of SME managers when adopting emerging ICTs, the literature review on SMEs is to provide the background of the industry and current emerging ICTs. Finally, the comprehensive literature review has led to the identification of challenges, gaps, and key theoretical concepts which have all contributed to the development of a conceptual framework for this study.

2.1   Small and Medium Enterprises in the UK

Small and medium enterprises (SMEs) have been defined and categorised differently in most research and countries recently, but this study follows the Department for Business, Innovation and Skills (BIS, 2015) in its new definition and classifications of SMEs in the UK. The study considers the number in the workforce as the standard in determining whether a firm is eligible as an SME and other classifications by the Department for Business, Innovation and Skills, which employed 1-249 people. According to BIS (2015), there were 5.3 million small business (with 1 to 49 employees), which is 99.3% of the total business population. A further 33,000 (0.6%) were medium-sized businesses (with 50 to 249 employees), and this means there were 5.4 million SMEs in total in the UK. At the start of 2015 total employment in small businesses was 12.4 million (48% of the total). While turnover estimated at £1.2 trillion (33%); SME employment was 15.6 million (60%) and turnover £1.8 trillion (47%); employment in larger businesses was 10.3 million (40%) and turnover £2.0 trillion (53%). The definitions and classifications of SMEs might be different from various scholars, countries and continents, but they have unique features that are the same regardless of the country. The features discussed briefly.

When it comes to both financial and human resources, SMEs have challenges with these two resources, according to the literature, which affects the way SMEs make decisions on adopting ICT, and limits their ICT adoption. SMEs have limited access to finance and mostly, there is a limited human resource to support them during this process when compared

with larger companies (Fassin et al., 2011, Kuan and Chau, 2001). According to Lee and Xia (2006), an organisation which has the financial and technical resources has a resilient motivating factor to innovate. The reverse is the case in SMEs because of their limited resources, such as financial, human resources and technical.

In SME the management and operation are always from the owner, sometimes the management style and structure depend on his attitude and behaviour. In recent research findings by Dwivedi et al. (2009b) ownership and management structure empowered SME managers to acquire and create new knowledge and also they are the company' strategic initiator. Therefore, the owner can change the corporate culture and to enact values other than profit (Fassin et al., 2011).

According to Duan et al. (2002), skills and knowledge deficiencies in SMEs are significant barriers to the adoption of emerging ICTs. There are no professional competencies found in SMEs when compared with larger companies; as a result, owner-managers may have less awareness of the operational and strategic benefits of technology than their larger counterpart (Grant et al., 2014).

For instance, in a recent study by Eze et al. (2013) on emerging ICT adoption in SMEs in the UK, an actor–network theory was used to underpin the research and face-to-face interviewing techniques as the data collection instrument. The research findings reported the recursive and dynamic nature of the emerging ICT adoption process in SMEs. In a similar research by Harindranath et al. (2008) ICT adoption in UK SMEs was explored: a survey questionnaire sent to 378 SMEs in the south-east of England. The objective of their investigation was to construct a snapshot of ICT usage by SMEs in economically significant sectors in this region. The designed research questions were: what prevents and facilitate the adoption and use of ICT among these firms, and where do SMEs acquire information on ICT-related issues. The survey suggests that most SMEs in the south-east of England are in general positively inclined towards adoption and use of ICTs, but only focused on operational matters with few extensions into the potential strategic use of such technologies in their business environments.

Furthermore, research on adoption of e-commerce in SMEs was examined by Pickernell et al. (2013) in association with both internal and external antecedents including trading behaviour, owner/manager characteristics, innovation, public sector involvement, business advice and finance sources. In a similar research by González-Martínez et al. (2015), the risk perceptions

of key stakeholders in SMEs when making decisions on technology investments were explored. Questionnaires were sent to 600 SMEs randomly selected, of which 125 completed the survey; a Likert scale used for data analysis. The findings suggest that a subjective element has a significant part in assessing technology risks, and the empirical result suggested that both e-business and experience and the role of decision-makers influenced risk perception in SMEs. In the same vein, Durkin et al. (2013) conducted an action research using multiple cases to research on SMEs in the north of England. The research was on social media adoption in SMEs; the aim was to develop a theoretical model through which more effective social media adoption will be understood. The researchers examined the nature and characteristics of the challenges faced by SME owner/managers when considering adopting and utilising social media for commercial advantages and the evolution of the model through this engagement. The findings showed that approach to social media adoptions varied by organisational context and staff competency.

2.2   Emerging ICTs

Innovation is any idea, practice or object that is perceived as fresh by the adopter or unit of adoption and categorised in relation to the amounts of change they make in the existing practices of an adopting organisation. (Baer et al., 2015, Damanpour, 1991, Hameed et al., 2012, Premkumar and Roberts, 1999, Rogers Everett, 1995). Nowadays innovation has been associated with technology, and sometimes innovation is not like technology but the process of adopting it does. The knowledge gap is a fundamental element in the adoption of innovation adoption process, and this will lead to disruptive technology (Badilescu-Buga, 2013). This study aims to fill by proposing an information behaviour framework of SME managers on how they fill the gap during adoption decision-making process. However, in this study innovation has been referred to emerging ICTs. Emerging ICTs include new and advanced technologies such as Mobile technologies (Smartphones), big data, cloud computing, software applications, the Internet, e-commerce, and Google Maps. When organisations link their companies to Google maps, this helps a user locate their stores or offices; this list is not all-inclusive as more new technologies are developing every day. Furthermore, according to Lee and Xia (2006), IT innovations are adopted as responses to change in both internal and external organisation environments, or as pro-active actions to influence the environments. The adoption (innovation adoption) gives the opportunity to

prospective adopters, as a unique way of solving problems and exploiting opportunities (Hameed et al., 2012).

2.3   Significance of information during adoption decision-making

Without knowing the importance of information, discussion on information behaviour cannot take place; thus, this will broaden our understanding why people seek information and have a comprehensive understanding of information behaviour. Drastic changes in technology and the regulatory and social environments have increased information flows, awareness, access, and usage. The increase in the emergence of electronics, computers and the Internet has changed managers' behaviours in seeking and using information. The challenge has changed from making a decision under information scarcity to making a decision with information overload (Tavares et al., 2015).

According to Au and Kauffman (2003), decision-makers will invest a realistic amount of time to gather all relevant information from all potential sources and process the information most advantageously before making a decision. Mithas et al. (2011) Postulate that information management capability has a significant impact and role when developing other capabilities of the company for customer management, process management, and performance management, and these capabilities favourably influence and contribute to customer, financial, human resources and organisational efficiency. Furthermore, researchers e.g. (Milliken, 1990, Jorosi, 2006, El Sawy, 1985) have argued that the reason top managers were able to reactively and pro-reactively survive in this uncertain and changing environment is because of efficient use of information.

Information availability becomes necessary in all business processes, particularly, in decision-making on financial matters. Information has become essential in everyday life, and it represents the precious and limited asset that forms the necessary support for all decision-making processes in a company (Černá, 2014). According to Van Riel et al. (2004), decisions relating to the development of a new service take place under high levels of uncertainty, because of unpredictable technological change and competitive developments in the marketplace. Lam et al. (2014) researched the effect of participative leadership and the role of leaders in information sharing. Their findings point out that awareness of great exchange of information improves adoption of a participation plan, which dissolves employees' defensive

cognitions against the participative leader and as a result, increases work performance. In contrast, perceptions of low information sharing irrespective of the level of participative leadership may give employees unreliable cues and make uncertainty about the consequences of participation, thereby limiting employees' attention and work effort. The demand for information is a derived demand which traders desire under uncertainty; as a result, information becomes an economic commodity (Allen, 1990). Researchers that have discussed the significant of information are numerous, for example, (Choo, 2006).

2.4   Uncertainty and Information needs

Uncertainty limits how far an organisation can go in planning and make a decision to execute a task. The level of uncertainty determines the level of information processed by the firm they encounter during decision-making, and to achieve a given level of performance, they must process information at the same level of uncertainty (Galbraith, 1974). Tushman and Nadler (1978) argued that organisation structure and its subunits are an information processing systems when firms face uncertainty. As information process refers to gathering, interpreting, and synthesis of information in the context of organisational decision-making. For an organisation to deal with numerous sources of uncertainty related to work, it must start gathering, and processing of information on the functioning of different units of the organisation about the quality of outputs, the conditions in external technical and market domains. Additionally, research (Wang, 2003) was carried out in Taiwan on firm information capacity, information requirements and the role information systems plays in the company; the result showed that an information business would do well and achieve greater performance when its information process and information requirement are fits together. The research results concluded that both degrees of centralization and formalisation of a firm agreed together positively with the importance of its information process requirement. It was suggested that rigid organisation structure will enhance performance when it is consistent with the company's information systems' role (Wang, 2003). According to Choo (2002), Information needs to arise from the problems, uncertainties, and ambiguities encountered in specific organisational situations and experiences.

Borlund and Dreier (2014) defined information need as an outcome of a change in the state of knowledge of the user which results in an anomalous state of knowledge, and an external situation can cause the change. When a user recognises that there is insufficient knowledge, this result in information needs to reduce uncertainty. In other words, information need arises

when there is a situation or a problem to solve; this triggers a requirement for information under the influence of the user's current cognitive and emotional state. Decision-makers need to be familiar with the unpredictability of the environment, gather information about its significant elements to make sense of the circumstances and to have the needed information to take decisions. These requirements sometimes come from a new development, innovation or emerging ICTs that the companies want to adopt. It could be the functionalities aspect of the ICTs or risks involved during the decision-making process or after implementation. Sometimes this information need can be a cognitive or situational information need of a decision-maker or information user (Wilson, 1997). In a research by Jorosi (2006) on information behaviour of SMEs, the result showed that SME managers consider information on their customers and competition information to be most important types of information their firm needs.

2.5   Clarification Information behaviour concepts

From an extensive literature review it was discovered that different terms, concepts and definitions have been used in the area of information behaviour. These are significant in this research and need to be clarified. The concepts are now briefly reviewed below. Also, the extensive literature review showed the term 'information behaviour' as the ways human beings interact with information and the means by which people seek and apply information. Information behaviour is not only limited to searching, it includes information gathering, seeking, acquisition, and use. According to Badilescu-Buga (2013), "Information behaviour is the sum of all activities that are part of the process of acquisition and use of information. These activities may lead to the transformation of information into knowledge". Similarly, Case (2012) stated that information behaviour comprises information seeking along with the totality of other unintentional or passive behaviours, as well as purposive behaviours. Several studies have been carried out on information behaviours, for example, Krikelas (1983), Niedzwiedzka (2003), and Spink et al. (2006).

The definition adopted for this Study is based on Wilson (2000) who highlighted and defined four terms in human information behaviour activities – "information behaviour, information seeking behaviour, information searching behaviour and information use behaviour". The definitions of the four terms by Wilson, which was adopted in this research, are given below. Out of these four terms, this study has focused on information behaviour because the

definition of information behaviour meets the information activities of the information users while seeking for information.

According to Wilson (2000, p49), Information Behaviour "is the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use."

Information Seeking Behaviour "is the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as the World Wide Web). " Information- seeking behaviours are those activities that can be applied in any contexts, for any purpose whether the user is seeking information to solve economically, health or technical problems (Timmers, 2010). Also, Osiobe (1998) argue that information seeking behaviours happened as a result of user recognition on perceived need and makes demands upon formal systems or other sources to satisfy the perceived need.

Another concept in the definition is Information Searching Behaviour is the 'micro-level' of behaviour employed by the searcher in interacting with information systems of all kinds. It consists of all the interactions with the system, whether at the level of human-computer interaction (for example, use of the mouse and clicks on links) or at the intellectual level (for example, adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from adjacent places on a library shelf is most useful). It also involves mental acts, such as judging the relevance of data or information retrieved.

Information Use Behaviour "consists of the physical and psychological acts involved in incorporating the information found into the person's existing knowledge base." Human beings search for information during a decision-making process or want to solve a problem or when facing a challenging situation. These challenges or barriers trigger information behaviours of a decision-maker during this period. As a result, the fundamental focus of this research is to understand information behaviour of SME managers' decision regarding adoption of emerging ICTs. The aim is to support SMEs on how to obtain and use information during this process.

Table 2.1: Summary of different information behaviour models

Components and Author	Brief explanation
Four elements of sense making are: as follow. **Situation**; the context that highlight when information is needed **A gap**; it identifies different between the present situation and desire situation **Outcome**; the result of situation **Bridge**; the process of closing the gaps. (Dervin, 1983, Dervin,1992, Dervin, 1998)	Sense-making theory discussed how an individual makes sense or fills a gap identified during a situation or a cognitive gap. It talks about the process the information users follow when problems arise. And how this gap/bridge is closed.
Starting: the way follows by the information user to commence seeking information. **Chaining:** Reading and following footnotes and citations in known material through citation indexes **Browsing:** 'semi-directed or semi-structured searching' **Differentiating:** filtering the amount of information obtained using sources of information **Monitoring:** keeping up-to-date or current awareness searching; **Extracting:** selectively identifying relevant material in an information source; **Verifying:** checking the truthfulness of information **Ending:** This may be defined as 'tying up loose ends' through a final search. Extracting(Ellis, 1989, Ellis et al., 1993),Wilson(1999)	Ellis describes the complexities in information behaviour. And proposed a model with six features.
Author of information objects, Information seekers Designers of database systems, Human indexers, Individual social, cultural or organisation context. (Ingwersen, 1996)	Ingwersen's model is basically on information seeking and information retrieval. Ingwersen's model combined most of the various cognitive actions in information seeking behaviour. The components (information needs and seeking) included in this model are outstanding among the information models.

Initiation, Selection, Exploration, Formulation, Collection, Presentation. (Kuhlthau, 1991)	Kuhlthau's Information Search Process (ISP) was developed by research in library users, initially school students. The ISP model looks similar to Ellis model (see above), but the major difference is that Ellis focuses on information seeker activities, while the ISP model represents a process, with a consecutive stage that associated with feeling and thought.
Wilson models (1981, 1997)	Wilson models (1981, 1997) Wilson's first information behaviour model discussed how information behaviour arises as a result of problem identification by an information user. In the process of satisfying or solving this problem, an individual will search or look for information using informal and formal sources of information. Wilson proposed another information model from reviewing literature in various disciplines not limited only to information science but included decision-making, psychology, innovation, health communication and consumer research. According to Wilson, the proposed needs can be physiological needs, affective needs, or cognitive needs.
(Leckie et al., 1996)	Leckie et al.'s 1996 model was proposed based on a review of research on three professional groups (engineers, healthcare, and lawyers) information behaviour. Leckie et al.'s model suggested that roles and associated tasks of professionals prompt their information needs and effectually leads to professionals' information seeking behaviour, because of multiple functions carried out by professionals in their day-to-day work.

The above studies showed the information behaviours of various information users when seeking for information in different contexts. These information behaviours arise based on individual information needs, tasks and situation during a particular period. Dervin's (1998) sense making theory indicates how an individual fills a gap or makes sense of a situation or closes a gap when a problem arises.

2.6   Information seeking

Al-Shboul and Abrizah (2013) Stated that a when decision-maker has information needs, the decision-maker is seeking an answer to a question or a solution to problem. These then leads

into information seeking mode: talking to others, searching the web, reading magazines or watching the news (Case, 2006). Similarly, Wilson (1981) model of information behaviour suggests that an information user's perceived information need trigger information seeking behaviour in order to satisfy that need, and makes demands upon formal or informal information sources. Therefore, information seeking behaviour's hard to generalise and defies observation because it varies so much across people, situations and objects of interest (Case, 2006). In recent research, by Park et al. (2014), an online investment community's users' behaviour for seeking and sharing information was investigated; the findings suggest that sense of belonging is more important in motivating investors to seek information. In Timmers and Glas (2010) studied undergraduate students' information seeking behaviour and pointed out that information seeking behaviour is a multidimensional construct with several underlying components, which is associated with any activities that applied in any context, whether seeking information to solve economic, health or technical problems.

2.7   Environmental scanning

A considerable amount of literature has been published on environmental scanning e.g. (Auster and Choo, 1993, Choo, 2001, Choudhury and Sampler, 1997, Karimi et al., 2004, Zhang et al., 2012). Environmental scanning starts from scanning needs identification and ends at information evaluation and use (Zhang et al., 2010). Environmental scanning is information needs, acquisition, evaluation and use of information about events, trends, emerging ICTs, competitors, reduction of uncertainty and equivocality, suppliers, technology; social, political, economic conditions, market uncertainty, government regulation, changes in the demands and wants of customers, and for strategy planning and decision-making (Aaker, 1983, Auster and Choo, 1992, Daft et al., 1988, McEwen, 2008, Yasai-Ardekani and Nystrom, 1996, Yoo and Sawyerr, 2014). Exploring information behaviour of SME managers goes along with an understanding of environmental scanning in this research.

The first serious discussion and analysis of environmental scanning emerged during the 1967s with Aguilar (1976). Aguilar (1967) defines environmental scanning as getting information about events and relationships in a company's external environment, the knowledge of which would assist top management in its task of charting the company's future course of action. Environment scanning involves looking at the relevant physical and social factors that are not within the boundaries of an organisation and are taken into

consideration during organisational decision-making process (Duncan, 1972). The information gathered could guide key managers in an organisation in the decision-making process while the lack of this information can make an organisation fall behind by not having information on areas such as technology, regulations and various trends (Albright, 2004). Choo (2002) categorised Environmental scanning as information viewing and information searching information. While information seeking has been termed as sources used in scanning the environment and organisation methods and systems deployed to monitor the environment. Information use is about decision-making, strategy planning or equivocality.

Summary

In conclusion, the literature review on information needs, seeking, environmental scanning, and emerging ICTs, as highlighted gaps in the literature and provided the rationale for the research questions, rationale for this research and interview questions. Finally, this provided background knowledge in information behaviour and importance of information during the decision-making process. Furthermore, the various concepts discussed above would guide the readers and help the readers to understand the different concepts and theories in information behaviours and how they are related to this research.

CHAPTER 3 Relevant theory review and theoretical framework

3.1 Introductions

This chapter presents the research model adopted for this study, the integration of the research aim and objectives with the TOE theoretical framework (technology organisation environment framework) and the literature reviewed to help develop a research model for this study. The research questions and objectives help inform a research methodology which is described in chapter 4. The key concepts of the TOE framework were used to guide the data collection, analysis and interpretation using a hybrid approach.

3.2 Theory review

Dwivedi et al. (2009a) discussed and analysed the most accepted theories for studying adoption decisions in SMEs. These theories are Rogers' Diffusion of Innovation Theory, Theory of Planned Behaviour, the Resource-based view of the firm and Technology Acceptance Model. Other theories used in studying ICT adoption in SMEs are Task-Technology Fit and the Technology-Organisation-Environment framework. These theories are discussed here in order to have a general idea and why they are not used as the theoretical underpinning for this study.

3.2.1 Diffusion of Innovation Theory

Diffusion of innovation theory (DOI) was proposed by Everett Rogers (1962). The theory was how innovation is communicated to the members of a social group. Innovation is the new technologies, idea, practice, or object, which are new to an individual or other unit of adoption. The diffusion process involves mass media and communication channel through which an individual get information on the perceived innovations (Rogers, 1995). The IDT theory argues that "potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation" (Agarwal, 2000). There are five characteristics of innovations theory mention by (Lee et al., 2011). The five significant innovation features are the relative advantage, compatibility, complexity, and trialability and observability. The characteristics explained end-users' adoption use and decision-making process. The TOE model is consistent to Rogers (1995) diffusion of innovation theory individual characteristics. Both internal and external organisation characteristics as drivers for innovation, which is

almost the same with TOE (technology and organisation context) but the inclusion of environment context in TOE model distinguish it from DOI and environment context can bring both constraints and opportunities to innovation (Baker, 2012, Oliveira and Martins, 2011). Rogers suggests that the rate of adoption is influenced by numerous opinions of relative advantage over a previous technology, compatibility with existing needs, complexity and perceived difficulty of use, and available trialability and observability to experiment and see the results of the innovation. However, according to Lawrence (2010) diffusion of innovation theory and technology acceptance model were developed with the concepts of the static individual computing environment in mind. Therefore, both are not much applicable in today's rapidly changing IT environment. Rogers recognises that sophisticated innovations require how-to knowledge to support the innovation-decision process. Furthermore, Rogers does not show how knowledge is been acquired. The most limitation is that it does not provide a lens for examining the nature of relationships and the complex social contexts in which small firms make decisions (Lawrence, 2010)

3.2.2 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) started as the Theory of Reasoned Action in 1980 to forecast an individual's objective to participate in behaviour at a particular time and period. The theory was proposed by Ajzen (1985). It explained why a person or an individual behaves in a certain way. The TPB explained how people have the power to control their behaviour through their intentions. The fundamental principles and concerned of the theory of planned behaviour is the prediction of intentions according to (Ajzen 2011). According to Ajzen (1985), not all plans are carried out; some are abandoned altogether while others are revised to fit changing circumstances. The theory of planned behaviour explained the relationships between intentions and actions, and factors that induce people to change their intentions. Furthermore, Ajzen (2011) stated that behavioural, normative and control beliefs are formed in rational, unbiased fashion. They accurately represent reality, but no matter how people arrive at their behavioural, normative and control beliefs, their attitudes towards the behaviour, their subjective norms and their perceptions of behavioural control follow automatically and continuously form their beliefs. It is from this angle that behaviour is known to be reasoned or planned behaviour. This intention is determined by three key concepts: people's attitude towards the particular behaviours, their subjective norms and their perceived behavioural control (Hrubes et al., 2001; Workman, 2005; De Cannière et al.,

2009,). Although TPB has a strong point in explaining and predicting IT adoption behaviours, it explicitly disregards the idiosyncrasies SMEs as well as the complexities of interrelationships between SMEs managers and employees, families, and external parties like technology acceptance model as well (Ukohal et al., 2011)

3.2.3   Resource-Based View of the firm

Resource-based view (RBV) of the firm, according to Barney (1991), is the ability of a company to sustain competitive advantages by instigating strategy that exploits their internal strengths, through responding to environment opportunities, while reducing the effect of external threats and escaping internal weakness. Three key concepts were acknowledged and defined in the RBV model by others - firms' resources, competitive advantages and sustained competitive advantage. Firm resources are all resources, both internal and external, within the reach of the company that are combined by the firm to implement a strategy. A firm's competitive advantage, according to Barney (1991), is the ability of a company to implement a strategy which competitors cannot implement and the concepts of sustained competitive advantages. RBV discards concepts, for instance, costless resource mobility, static environments, and monopolistic restraints but highlight the strategic significance of both resource possession and utilisation. However, resources are regarded in terms of their imitability and mobility. Showing how difficult are resources to reproduce and utilise by competitors (Henard and Mcfadyen 2012). According to Parker et al. (2009) the strong point of resources based theory is that it highlights the competences any company, including small ones, must have or acquire to adopt eBusiness, and it identifies intangible as well as tangible resources. However, RBV does not satisfactorily explain the eBusiness adoption processes of non-entrepreneurial small firms (Parker et al. 2009).

3.2.4   Technology Acceptance Model

The Technology Acceptance Model (TAM) is one of the popular theories widely used in the information systems discipline, especially for adoption decision in SMEs. TAM was designed by Davis (1989) and argued that most of the valid measurement scales for predicting user behaviours were in short supply. Those that use subjective measures are invalidated, and their relationship to systems usage is unknown. Two variables were designed, perceived ease of use and perceived usefulness, which are hypothesised to be fundamental determinants of user

acceptance behaviour. TAM is a new version of the Theory of Reasoned Action (TRA) to the field of the information system. TAM theorised that perceived usefulness and perceived ease of use control a user's determination to use a system with the intention to use serving as an intermediary of actual system use. Perceived usefulness is also seen as being directly impacted by perceived ease of use. The main purpose of the research is to pursue better measures for predicting and explaining user adoption behaviour and the theory originated from the theory of reasoned action. The research question was: what causes people to accept or reject information technology? However, TAM intensive focus has been on the prediction or explanation of a single behaviour conceptualised in a linear manner, i.e., system use defined and operationalized as an amount or frequency (Benbasat and Barki 2007).

3.2.5 Task Technology Fit

D'Ambra et al., (2013) Task-technology fit theory is an important user assessment construct in accepting and forecasting the utilisation of a particular technology. Task-technology fit theory (TTF) is a theory on why a user will use an IT; and for a user to use an IT, the technology must support the user intention and be fit for the task to be performed by the user (Goodhue and Thompson, 1995). Furthermore, Task-technology fit has three essential characteristics which formed its function. The task characteristics, technology features and individual features and they directly influence performance, and indirectly influence utilisation (Tanya, 2008). According to Montazemi (2006), the task-technology fit is the extent to which IT helps individual end user in the accomplishment of their task. TTF has been investigated and used by different research in the information systems field (Burke et al., 2001, Klopping and McKinney, 2004, Lepanto et al., 2011, Montazemi, 2006). However, according to Chwelos et al. (2001), TTF focused more on tasks and neglected other aspects of the technology process.

3.2.6 Technology Organisation Environment Framework (TOE)

The TOE framework was proposed by Tornatzky and Fleischer (1990). The framework discussed three factors that influence adoption decision of emerging ICTs. The three factors are technology, organisation, and environment; and these factors provide an important analytical framework for studying the adoption decision and assimilation of different types of IT innovations (Oliveira and Martins, 2011). According to Tornatzky and Fleischer (1990),

these three factors affect the attitude of a company in understanding the need for, search for, and adoption of a new IT. Furthermore, according to Dwivedi et al. (2009a) research finding, no frequently-used theory satisfactorily describes small firm adoption decision among the theories they critical analysed because each ignores important aspects of small business idiosyncrasy; and the analysis result advocates that an integrated theoretical framework is needed.

In conclusion, after analysis of various standard theories discussed above together with the research findings of Dwivedi et al. (2009a) on commonly-used theories for research on small business. Their analysis suggests that an integrated theoretical framework is needed in SME research because important aspects of small firm idiosyncrasies were omitted. As a result of their findings, using TOE model to underpin this research will contribute to theory and knowledge in information systems because TOE is an integrated model that integrates technology organisation and environment together. Based on the discussion above, the researcher concluded that the use of an appropriate and verified theory would be of significance in this research because this would lead to better explore and explain information behaviours and factors that influence information behaviours of SME managers during adoption decision-making when adopting emerging ICTs.

TOE framework helps in achieving the objectives and aim of this research as stated in section 1.5. In a research done on the importance of information by Citroen (2011), executives who follow a rational approach were interviewed. The study suggests that managers needed information on issues such as competition, markets, technologies and trends in the societal environment that assist the organisation to make a rational strategy decision. Therefore, the availability of up-to-date and appropriate information increases decision-making effectiveness. As a result, external information is paramount in both decision-making and problem-solving at the individual level and organisational level, regardless of the difference in the context and subjects in the information seeking literature (Guo, 2011). Hence, understanding of information needs and behaviour of SME managers could lead to a better evaluation of these factors (technology, organisation and environment) during adoption decision-making process when adopting emerging ICTs. Such assessments will help in reducing uncertainties related to emerging ICTs and increase successful implementation of emerging ICTs in SMEs.

Finally, the summary of the issues on adoption decision-making process, it seems information behaviour is the unnoticed area in the adoption decision-making process in SMEs. No comprehensive research aiming in detailing the information behaviour of SMEs in the UK when adopting emerging ICTs could be established in the literature to the researcher's knowledge. Therefore, this research intends to fill this gap on information behaviour of SMEs managers.

This study set out with the research aim to explore and understand the information behaviour of SME managers' adoption decision-making process when adopting emerging ICTs. To explore and understand SME managers' information behaviour, objective 1 is to review existing literature, which helped to have a comprehensive understanding of information behaviour and issues associated with emerging ICTs adoption decision-making process and gaps identified. Furthermore, the research provides an understanding of how technology advancement, organisation, and environmental changes and unpredictable, both internal and external, environment influence implementation of IT, whether success or failure, which sometimes become challenges, problems in SMEs. These inform adopting the TOE model as a theoretical underpinning for this research because the TOE model integrates these three key concepts that are beyond the control of SME managers as contexts in the model. These three components represent "both constraints and opportunities for technological innovation" and influence the way a firm sees the need for, searches and adopts new technology. (Baker, 2012). In other words, these elements trigger information behaviour of SME managers for them to reduce the uncertainty associated with emerging ICTs and the opportunities as well. To have holistic information behaviour of SME managers, these objectives were formulated using the TOE model and knowledge on information behaviour from the literature review. The research objectives guided interview question design. (See Appendix1)

3.3   Technology context of perceived information needs

Technological context refers to both the internal and external technologies that are appropriate to the organisation. This comprises technologies that are available within the marketplace but presently in use at the organisation, and current practices, technologies that have not been adopted in organisations as well (Gupta et al., 2013, Gutierrez et al., 2015, Oliveira and Martins, 2011). According to Liao et al. (2003), internal knowledge and external of a firm will promote innovation and the company must consider and evaluate the kind of organisation changes created by adopting an innovation (Baker, 2012).

Technology context in this research stands for those internal variables SME managers consider before adopting an emerging ICT in their company. These variables are relevant to their business's successful adoption decision-making, but there are not enough or lack of information on those variables before or after they adopt the new technology. These variables influence adoption of new technology in an organisation. These concepts trigger SME managers to seek for information during this process. The TOE model has many themes, and numerous scholars and researchers have discussed these themes and provide a theoretical direction for many studies. These concepts are now briefly discussed.

3.3.1 Compatibility

It is associated with either the existing technology that will be able to perform with the emerging ICT in the firm without a challenge or not, which the SME manager wants to know during the decision-making process. According to Rogers (1983), compatibility refers to the degree to which innovation fits with the potential adopter's existing values, previous practices and current needs. Some studies have found that compatibility is a major factor for consideration during information technology decision-making and adoption of innovation in SMEs (Alshamaila et al., 2013, Ramdani et al., 2013, Zhu et al., 2003). Alshamaila et al., (2013) stated that it is compulsory for SMEs to make certain innovation is consistent with their current needs and existing values.

3.3.2 Relative advantages

According to Rogers (1995), relative advantages are how a technological factor is perceived in providing a greater advantage for organisations, specifically, in SMEs how this innovation will bring growth in business, business process improvement and reducing business operating and administrative costs (Markus and Tanis, 2000). Previous studies have reported that relative advantages have a significant impact on innovation adoption decision (Grandon and Pearson, 2004, To and Ngai, 2006).

3.3.3 Perceived affordability

The cost of adopting emerging ICT plays a significant role in its adoption especially in SMEs where lack of funds is one of the challenges. Perceived cost saving is important in this

research because of limited financial resources in SME; it is better for the owners to know the price of the ICT because there are numerous emerging ICTs outside supplying technology with different prices. Perceived cost can also include costs for employee training in using the emerging ICT; it could also be regarding saving human time and managing new customers.

3.4   Organisation context of perceived information needs

Organisation context explains how firm resources and firm characteristics, as well as firm size, intra-firm communication processes and the lack resources, influence adoption decisions. These concepts affect adoption and implementation decisions in several ways (Baker, 2012). The capacity of a firm to have all these resources will ease adoption decision-making process. However, this research focuses on understanding information behaviour of SME managers during adoption process to help them to overcome these contexts. As organisation context is one of the factors influencing adoption decisions, and as a result, some concepts are identified as key concepts that help to achieve the aim and objectives of this research. Many researchers have focused on adoption and implantation of emerging ICTs but have failed to understand how these firms gather information on these factors as challenges, especially in SMEs that have limited resources and other organisation challenges.

3.4.1   Perceived employee acceptance

An employee who does not feel they have an opinion can become a problem to organisation IT strategy, especially in SMEs; this can cause non-compliance to ICT's policy, not using the IT and sometimes lower turnover. An employee who feels unrepresented is more likely to be a hindrance to the adoption and implementation of emerging ICTs. Furthermore, how does an organisation determine their employee skills to use emerging ICTs or evaluate their employee's readiness to accept this emerging ICT? The pre-knowledge of SME employees on an emerging ICT will increase the chance of adopting the ICT, especially in SMEs that have inadequate IT personnel, and lack of resources, in their organisation. Also, how the employee sees the importance of this innovation to their organisation is another factor to be considered (Baker, 2012).

3.4.2   Owner support

Top management support in adopting emerging ICT or creating a competitive environment through emerging ICT will determine its implementation and adoption; the support can come in the form of management awareness or technology readiness (Gutierrez et al., 2015).

Top management can encourage change by communicating and highlighting values through an articulated vision for the organisation (Ramdani et al., 2013, Thong, 1999) and seeking for information on an emerging ICT; the firm can help the organisation. In a research by Tong (1999), the result showed that any small businesses that have greater information processing information would be likely to adopt more information systems. Also, a chief executive officer of any small business that has a better understanding of advantages of innovation and is ready to invest their limited resources in information systems will adopt more (Thong, 1999).

3.5   Environment context of perceived information needs

From the extensive literature review, it was discovered that environmental context refers to both the internal and external forces and changes that have an impact and put pressure on SMEs. It could be the surroundings where a firm conducts its business. As a result of technology advancement, globalisation, trading partner forces, government policy, and strategic thinking, (Chau and Tam, 1997, Mehrtens et al., 2001, Nguyen et al., 2015, Siggelkow and Rivkin, 2005). All these have made information on surroundings (internal and external) outstanding during adoption decision-making process when adopting emerging ICTs in SMEs (Andries and Debackere, 2006). Information on the environment is essential because there are changes taking place in the environment that have a significant influence on a company's decision. The strength of the organisations, especially in an SME, means the ability of the SME to have an advantage over its competitors; and investigation of internal environment concerning new technologies. Thong et al. (1996) argue that top management support is essential for information systems effectiveness, but high-quality external information systems expertise is even more critical for small businesses operating in an environment of resource poverty. The elements discussed as a standard set of illustrations that will help us to understand the environmental context of perceived information needs that may trigger SME managers' information behaviours. These elements regularly discussed in the

ICT adoption literature; as a result, this signifies that they are essential elements in the environmental context.

3.5.1 Competitor intelligence gathering

Competitive intelligence is the information needs on what types of emerging ICTs the competitor are using. Secondly, it is gathering, analysing, and using information about IT, customers, competitors, and any other feature of the environment context, which would support SME managers 'adoption decision-making when adopting emerging ICTs. In recent research by Oliveira and Martins (2010) the research findings discovered that competitive pressure is one of the drivers for adoption of technology which managers should be aware. Grover (1993) suggests that competitor scanning is a company's willingness to scan the environment and the importance placed on monitoring competitors' moves by the firm.

3.5.2 Provider credibility

The credibility of technology provider or manufacturer will support SME managers' decision-making and is significant to deliver what they have been promised or told the technology can do. Numerous technology providers or manufacturers are selling or providing the same services or technology. When looking at the various alternatives of companies to select from in the technology marketplace, it can be difficult to know the credibility of a provider. How can they (SME managers) get help in case there is any problem? How can they know the one (technology provider) that delivers what they promise? These questions will make SMEs managers seek for information when adopting emerging ICTs. According to Nguyen (2009), finding the appropriate know-how person to support with IT adoption is even tougher for many SMEs as not all consultants or software vendors are suitable for a firm's IT adoption.

3.5.3 Perceived technology market growth

The growth in technology and its market is reshaping the industry and what they are adopting. SME managers have to search for the latest technology in other to remain in business, and use whichever one has the potential to help them deliver their service in an affordable way. Several studies have discovered that perceived market growth, or industry, is

a significant factor in ICT adoption in SMEs, and they can be informed of barriers or opportunities (Ramdani et al., 2013).

3.5.4 Customer's information gathering

The pressure from customers is another factor SME managers will seek or scan information on regarding emerging ICTs. According to Mehrtens et al. (2001), external pressures from the environment will make an SME adopt ICT such as the Internet. This external pressure mostly comes from the company's customers, and this will lead to SME managers seeking for information on emerging ICTs that can help in meeting their clients' requirements. Premkumar and Roberts (1999) stated that small businesses are more at risk to customer pressure because they are economically dependent on the bigger customers for their survival, and this becomes part of a strategy to have these technologies to compete in the marketplace.

3.5.5 Government policy

Government policy is the activities, strategy, and actions taken by the government to encourage adoption of emerging ICTs, particularly in SMEs, as a result of different challenges and barriers they have. Government policy identified as a pressure that could push a company to adopt technology while some may choose not to adopt the technology; but in order to fulfil government legal requirement on technology, this can push them to do so (Kuan and Chau, 2001). Government regulatory activity has an impact in two ways during adoption decision: it can either be beneficial or detrimental to innovation (Baker, 2012).

3.6 Influential factors

These are factors that influence SME owners' information use, sources of information when they scan the environment and seek for information to reduce uncertainty and complexity during emerging ICT adoption decision-making process. There is various information sources and information on the Internet regarding emerging ICTs; these create burdens or challenges to choose from this information or identify original sources of information. Information overload can waste the time of an information user when scanning the environment.

According to Miles and Huberman (1994), a conceptual framework demonstrates the main effects that are to be studied, which consist of constructs and variables together with their

relationships. Secondly, it provides a structured approach to communicating research findings (Smyth, 2006). To understand the complexity of information behaviours of SME managers during adoption decision-making; the TOE framework is adopted to underpin this research because it integrates three contexts an adopter considers during the adoption decision-making process. These three contexts technology, organisation and environmental change constantly and put pressure on companies. Determine success of technology implementation and are drivers and barriers to technology adoption, as discussed in section 1.2., The TOE framework integrated these three contexts together and these help in the design of a theoretical framework for this research and explored information behaviours of SME managers. According to Wilson (1981) information behaviour model, information seeking behaviours arise for three reasons, as a consequence of a need perceived by an information user, for the information user to satisfy those requirements, both formal and informal sources of information or services will be consulted. The major context of information needs identified by Wilson that leads to information needs is the environment, social role and personal needs, which can be physiological, affective and cognitive states of the information user. Therefore, using TOE framework will help us to explore information behaviour of SME managers acknowledging that both internal and external put pressures on small businesses to adopt emerging ICTs and both are known as drivers and barriers to adoption (Nguyen, 2009). Hence, SME managers will consult both internal and external sources of information when seeking for information on emerging ICTs. Therefore, the theoretical framework shows that this research explores factors that influence these information source selections and information use in SMEs during adoption decision -making process.

In conclusion, in this chapter, the research theoretical underpinning, various research frameworks and literature review within information behaviours were discussed. The next chapter discusses the research methodology adopted, strategy sampling in this study and justification for doing that.

CHAPTER 4 Research Methodology

4.1 Introduction

The purpose of this chapter is to discuss and explain the methodology followed towards meeting the objectives (section 1.5) of the present study within the context of research methods commonly used in the area of information systems (IS). This chapter introduces the research methodology procedures in this research and how they helped in data collection, analysis and development of the research framework. The interpretive research has been carefully preferred as the most suitable for the elaboration of the research framework. The subsequent sections define the data collection stages for this study, which involved unstructured interview for the preliminary study, and semi-structured interview for the primary study.

4.2 Nature of the research

According to (Myers, 2013), an analysis method is determined by the research methodology adopted in a study. This study was designed to explore and understand SME managers' information behaviour during adoption decision-making process when adopting emerging ICTs, such as those discussed in section 2.2, the factors that influence their information behaviour and adoption decision making in a natural environment when adopting emerging ICTs. According to Chan and Ngai (2007), qualitative study details the reality in a significant element and is mostly, valuable when a natural setting or a focus on modern-day events is needed. Furthermore, according to Myers (1997), IS research has shifted from technological to managerial and organisational issues, and this makes qualitative methods familiar in the field. For these reasons, qualitative research method was considered appropriate for this study because the participants' information behaviours were investigated by talking to them, to find out the reasons for their actions and experience during adoption decision-making process. This research is fitted in an interpretative philosophy because the participants' views would be captured in natural settings and their information behaviour during technology decision on emerging ICTs would be explored. It would help to generate new understanding of the complex human experience that influences information behaviour of SME managers during adoption decisions. This research is an exploratory study using interviews as data collection methods through inductive and deductive approach as a research strategy. Myer (2013)

describes inductive as more open-ended and exploratory where the main purpose is theory building from empirical data while the deductive approach is more to test a theory or confirm a theory and is a top-down approach.

4.3   Philosophical underpinnings

4.3.1   Ontology and epistemology

According to Creswell (2007), qualitative researchers make some certain philosophical assumptions towards the nature of reality, ontology. How researchers know what they know is called epistemology. Ontology assumes that reality, as we know it is constructed inter-subjectively through the meanings and understandings, developed socially and experientially. Epistemology believes that we cannot separate ourselves from what we are aware. The investigator and the object of investigation are linked such that who we are and how we understand the world is a central part of how we understand ourselves, others and the world. Creswell (2007) states that when researchers conduct qualitative research they are embracing the idea of multiple realities, and this is known as the ontological assumption while the epistemological assumption in qualitative research means the researchers try to get closer to the participants studied. In practice, participants studied in the field where they are working or live. As a result, the twenty participants were interviewed in their offices and through telephone calls after agreeing to participate and necessary information had been given to them. It gives the researcher the opportunity to have first-hand information from the participants. In a similar argument, on the nature of realities by Norman and Lincoln (1994), the basic beliefs that guide any paradigm are the answers that are given to three fundamental questions. These questions are an ontological question, on what is the form and nature of reality and what is there that can be known about it? Epistemology questions are "what is nature of the relationship between the knower and what can be known?" While the questions for the methodological are how can the inquirer go about finding out what he or she believes can be known? Furthermore, Myers (2013) classified research methods into quantitative and qualitative research methods; another way he classified research methods is to differentiate between philosophical assumptions guiding the research; both quantitative and qualitative research methods are based on some underlying assumptions about what constitutes a "valid" research. Table 4.1 shows the most commonly-used assumptions in the IS field, positivism and Interpretivism (Myers, 1997, Orlikowski and Baroudi, 1991).

Table 4.1: Differences between positivist and interpretive research approaches

Meta-theoretical Assumptions About	Positivism	Interpretivism
Ontology	Person (researcher) and reality are separate.	Person (researcher) and reality are inseparable (life-world).
Epistemology	Objective reality exists beyond the human mind.	Knowledge of the world is intentionally constituted through a person's lived experience.
Research Object	Research object has inherent qualities that exist independently of the researcher.	Research object is interpreted in light of meaning structure of person's (researcher's) lived experience.
Method	Statistics, content analysis.	Hermeneutics, phenomenology, etc.
Theory of Truth	Correspondence theory of truth: one-to-one mapping between research statements and reality.	Truth as intentional fulfilment: interpretations of research object match lived experience of object.
Validity	Certainty: data truly measures reality.	Defensible knowledge claims.
Reliability	Replicability: research results can be reproduced.	Interpretive awareness: researchers recognise and address implications of their subjectivity.

Source: Adapted from Weber (2004)

4.3.2 Ontological approach for this study

Apparently, a subjectivist viewpoint was adopted based on beliefs about the world and constant change of technologies interacting with the participants and is the best way because involving this approach helps in exploring their experience. It is more reliable with the subjective because of the challenging nature and significance of information behaviours and factors that influence information behaviours of SME managers during adoption decision-making. According to Orlikowski and Baroudi (1991), interpretive researchers recognise that as meanings are formed, transferred, and used, they are also negotiated, and hence that interpretation of reality may shift over time as circumstances, objectives, and constituencies change.

4.3.3 Epistemological approach for this study

Epistemology is what knowledge is and how knowledge is acquired, which is affected by how the researcher sees the world or views it (ontology) (Hirschheim, 1985, Mingers, 2003). This was explored through interaction (unstructured and semi-structured interview) with the

researcher and SME managers that have adopted any emerging ICTs in the last five years. The participants share their experience on their information behaviours and factors that influence the behaviours.

4.3.4 Impact of theoretical underpinning

The technology organisation environment model was used in this method to guide the data collection, design the research questions, analyse the data, and this formed the process of a deductive approach while the information behaviours follow an inductive approach theory not used. The subjective nature of this research makes it difficult to argue that there was no researcher bias but to solve this problem of bias, research rigour was carried out using triangulation methods and other processes as discussed in the subsequent sections.

4.3.5 Interpretivism

The researcher's determination is to make sense of or understand the world from other people's interpretations; as a result, qualitative research is also called interpretive research (Creswell, 2007). It depends on the goals, contexts and philosophical perspectives, why they are using them. Indeed, interpretivists explicitly adopt a non-deterministic standpoint, attempting to explore the phenomena of interest in its natural setting, consciously not imposing any a priori understanding of it. Mostly, it follows the assumption that access to reality (given or socially constructed) is only through social constructions. Such as language, consciousness and shared meanings, but it attempts to understand occurrence through the importance people allocate to them, not that figure and interpretive research in IS are aimed to produce an understanding of the context of the IS (Myers, 2013). Examples of interpretive research in information systems can be found in the work of Boland (Butler, 1998, Orlikowski and Gash, 1994, Walsham and Han, 1993).

In summary, this research is fitted in an interpretative philosophy because the participants' views were captured in a social setting and their information behaviours during adoption decision on emerging ICTs explored in a social setting. It generates new understanding of the complex human experience and factors that influenced information behaviour of SME managers during emerging ICT adoption decision making.

4.4   Qualitative Research Methods

According to Myers (2013), research could be classified and characterised in different ways, but the most popular classification is between qualitative and quantitative research methods. Furthermore, Myers stated that quantitative research methods were formerly recognised in the natural sciences to study natural phenomena. Types of quantitative methods acknowledged in the social sciences methods are survey methods. Examples of quantitative methods now well accepted in the social sciences include survey methods, which include laboratory experiments, formal methods, and numerical methods, for instance, mathematical modelling. Also, quantitative researchers believe in numbers, and they use statistical tools and packages to analyse their data during the data analysis process.

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Types of qualitative methods are action research, case study research and grounded theory research. Qualitative data collection methods are interviews, observations, and document records. Also, qualitative researchers investigate and observe individuals' everyday social work, which leads them to particular circumstances or cases (Norman and Lincoln, 1994). It is a complex, changing and contested field; and the site of numerous methodologies and research practices. Therefore, it is not a single entity but an umbrella term which includes enormous variety. The three aspects that make qualitative research methods are unique research paradigms, approaches to data, and methods of data analysis (Punch, 2005). Most importantly, qualitative researchers use it to study individuals' life experiences in a social setting or environment. The researcher is more worried about the perceived meaning rather than the actual meaning. Miles and Huberman (1994) listed recurring characteristics of naturalist research. These recurring features are often used differently in any traditional research such as Interpretivism, social anthropology, and collaborative social research (Miles and Huberman, 1994).

Both quantitative and qualitative research methods are important and useful as well as necessary in researching business organisations. Additionally, both have advantages and disadvantages when using them (Myers, 2012). Having discussed the key features of quantitative and qualitative research methods, the research method chosen for this study is qualitative in nature, and the justification for this is discussed in the subsequent section.

4.5   Justification for interpretive and qualitative research in this study

The significance of understanding the paradigm underpinning one's research cannot be exaggerated, as the paradigm regulates the standards by which the research will be assessed and be evaluated based on the research paradigm, method and data collection. The paradigm plays a significant role in selecting research method and both data collection and analysis. In this research, a greater consideration has been observed before selecting interpretive research for this study. In this paradigm, researcher values are assumed to exist (and are even embraced), and subjectivity is an integral part of the research.

One of the reasons for selecting an interpretive approach is that the underlying research assumption for this research from the literature review presented in chapters 2 and 3 indicates that there are many uncertainties concerning technology, organisation and environment relating to the decision-making process and information behaviour during adoption decision-making process when adopting emerging ICTs. Adoption decision-making process and information behaviour cannot be separated from social context and the shared experience of SME managers and the researcher. Interpretive research assists in shared experiences of SME owners' decision-making process and information behaviour. Interpretive paradigm does not test theories or replicate researching findings; instead, results are representative of the interpretation of those experiencing the phenomenon being investigated (Shah and Corley, 2006).

Review on methodology usage in IS revealed that positivism had been the major research paradigm that dominates the field; hence, to use another method was advocated like Walsham (1995) states that interpretive research has gained ground in the IS community as a methodological approach. There is still a shortage of research that has applied this approach (interpretive) in technology adoption (Williams et al., 2009). Also, there has been a shift in the IS field from technological to managerial and organisational questions; therefore, interest now is how context and innovations interact. To understand this phenomenon, one must study the structure of the industry (Benbasat et al., 1987). In the IS field, researchers measure independent and dependent variables in their natural context; however, no control manipulation is involved. This study explores emerging ICTs in the context of technology, organisation and environment and how SME managers interact and interpret these contexts during adoption decision-making process by seeking for information on factors that influence their information behaviour. It can be achieved by talking to those who have the experience.

In this paradigm (interpretive), both the researcher and participants' values are assumed to exist (and are even embraced), and subjectivity is an integral part of the research (Morrow, 2007). A fundamental difference between interpretive and alternative methods is that the interpretive researcher may have less a priori knowledge of what the variables of interest will be and how they will be measured (Benbasat et al., 1987). Therefore, researching on information behaviour of SME managers can be done based on the experience of those that have adopted emerging ICTs and the factors that influence their decision-making and information behaviour can only be studied through interaction with the participants in a subjective way without having any defined dependent variables or independent variables.

Interpretative research allows social interaction, and interpretation comes via the understanding of group actions and interactions. Both the social actors and the researchers make the interpretation of meaning. Interview collaborates acts between the two parties (interviewer and the interviewee); this will not allow the gathering of information by one person (Huberman et al., 1994). Therefore, to research on the information behaviour during the adoption decision-making process, there is a need for a research approach that allows firms to be viewed in their totality and permits researchers to get close to participants and interpret their perceptions. Section 1.5 discussed the aim and objectives of this research, and when discussing a research philosophy, certain assumptions and perspectives are accepted, and certain strategies and interpretations should be involved (4.3.1 and 4.3.5). Exploring what is hidden behind the informant behaviour when adopting emerging ICTs can be done by applying an interpretive approach to their interaction process. This makes a more in-depth look at the context of the interaction within their environment, technology and organisation and information on these contexts. An interpretive approach also reveals what participants shared and why they were sharing it, and this was done in this particular way as sometimes information behaviour involves sharing of information among information users. This approach allows the study of the context of interactions and the influences on those interactions on information behaviour of SME managers and their decision-making process. Interpretive philosophy has become more developed in recent years and, increasingly, is applied to IS studies.

Furthermore, most of the researches on ICT adoption were on larger organisations. This gave the researcher the opportunity to research on emerging ICT adoption in SMEs; as pointed out by Goldkuhl (2012), the interpretive paradigm allows researchers to acknowledge their existence, to reconstruct them, to understand them, and avoid distorting them and finally use

them as building blocks in the theorising. As discussed in chapter 1, one of the objectives of this research is to develop a conceptual frame on information behaviour of SME managers during adoption decision-making process from those that have adopted emerging ICTs in the last five years.

4.6   Research quality and rigour

Research quality and rigour in this research are important because interpretive researchers are not saying to the reader that they are reporting facts; instead, they are reporting their interpretation of other people's interpretations (Miles and Huberman, 1994).

Many scholars have discussed different approaches to quality and rigour in qualitative research in IS (Caldeira and Ward, 2002, Lee and Hubona, 2009) and other research (Benbasat et al., 1987, Eisenhardt, 1989, Kuper et al., 2008, Roberts et al., 2006). But the most important one is Lincoln and Guba's framework (1985). In order to ensure quality and rigour in this research, Lincoln and Guba's framework was used. The four criteria proposed by Lincoln and Guba (1985) are credibility, dependability; confirmability and transferability, which formed the framework for determining the rigour of this research. These processes follow Shenton's (2004) strategies for ensuring trustworthiness in qualitative research. Shenton (2004) highlighted how a researcher could apply Lincoln and Guba's framework in a study although these criteria are mostly used in qualitative research especially in interpretative research.

Table 4.2: Comparison between quantitative and qualitative research for quality and rigour (Adopted from Lincoln and Guba 1985 and Shenton 2004)

Quantitative	Qualitative
Positivism	Interpretivism
Validity	Trustworthiness
Objectivity	Conformability
Reliability	Dependability
Internal validity	Credibility
External validity	Transferability

Table 4.3: Strategy for ensuring quality in qualitative research following Lincoln's methods (Adapted from Shenton 2004)

Quality criterion	Possible provision made by researcher
Credibility	Adoption of appropriate well recognised research methods Development of early familiarity with culture of participating organisations Random sampling of individuals serving as informants Triangulation via use of different methods, different types of informants and different sites. Tactics to help ensure honesty in informants Iterative questioning in data collection dialogues Debriefing sessions between researcher and superiors Use of "reflective commentary" Description of background, qualifications and experience of the researcher. Member checks of data collected and interpretations/theories formed Thick description of phenomenon under scrutiny
Transferability	Provision of background data to establish context of study and detailed description of phenomenon in question to allow comparisons to be made
Dependability	Employment of "overlapping methods" In-depth methodological description to allow study to be repeated
Confirmability	Triangulation to reduce effect of investigator bias Admission of researcher's beliefs and assumptions Recognition of shortcomings in study's methods and their potential effects In-depth methodological description to allow integrity of research results to be scrutinised Use of diagrams to demonstrate "audit trail"

4.7 Applicability of triangulation method and research rigour

4.7.1 Credibility

Triangulation methods were used to ensure the reliability and trustworthiness of the study. This approach was adopted to add valuable insight and have a comprehensive understanding of the findings that emerged from unstructured interviews, but not for generalizability. Triangulation helped to control bias and establish theoretical validation (Caldeira and Ward, 2002, Chan and Ngai, 2007, Golafshani, 2003, Luckett et al., 2013).

As described above in table 4.3, credibility was established in this study through an adoption of a good research design in the qualitative method; see chapter 4 for the research design. As discussed in Appendix1, interactive questions were asked at the start of each interview and emails were sent earlier before that day. These helped to establish social relationships before

the interviewing day and familiarise the researcher with the participant organisations. The purposeful and snowball selection of participants was from the services industry in the UK in different companies of the sector. According to Shenton (2004), when similar results emerged at various sites, findings may have greater credibility in the eyes of the reader." Participants were also told earlier of their right to cancel an appointment or interview without any reason and were given the opportunity of communicating to the researcher any questions they had regarding the data. It added richness to the data. The preliminary study helped to familiarise the researcher with the culture of SME managers in the UK before the main study because of a good relationship and respect are given to them, the earlier participants introduced some of their business partners in the same industry to participate in the study.

Credibility also enhanced through triangulation methods applied in this study. Bryman (2012) mentions four types of triangulation method, namely, data, methodological, investigator and theoretical methods.

The primary reason for triangulation is that using one research method in research will introduce dataset or researcher bias. Various triangulation methods are discussed in the literature (see Bryman, 2012) but those that were applied in this study are discussed below.

4.7.2 Transferability

Transferability in this study was established through the thick description of sampling strategy and how decisions were made when selecting those that participated in this study. Their location, role, region, and sector of participants are provided in sections 4.9 this enhanced the transferability of this research. Also, different quotes from participants were used as confirmations to indicate numerous participants interviewed in this study. The details of the research setting, the detailed account of the methodology, and the interpretation of the findings have provided confirmation to back the results of research' applicability to other future research and SME managers.

4.7.3 Dependability

The first component to start dependability in this study was to discuss in detail the aim, objectives and research questions of this study. The various decisions on sampling strategy, the justification for using the qualitative method and interpretative analysis were stated in section4.5. The field work started by following interview procedure on qualitative method data collection guidelines by (Myers and Newman 2007). NVivo 10 software as a tool for

data storage and analysis and thematic analysis adopted as a method for data analysis following (Braun and Clarke, 2006) guidelines for qualitative data analysis. It is argued that this study has shown the process that any future researcher could use to repeat this work. Secondly, the section has pointed out proper research practices that would enable the reader of this study to have an in-depth understanding of the interpretative and qualitative research method.

4.7.4   Confirmability

The confirmability of this study is possible through given details of every action and process that was followed from start to finish. Confirmability is crucial as part of the research quality and rigour process in qualitative research. Data from individuals and groups are easily retrieved, sorted, searched, and tracked using NVivo, and patterns emerged from different sources can easily be compared with those in another. Using computer-based software management tool such as NVivo 10 makes it difficult to hide any part of the process. This can be used by another researcher to reanalyse the data and confirmability would be established. Dependability and confirmability are firmly bound together. These have enhanced both dependability and confirmability in this study (Smyth, 2006)

4.7.5   Data triangulation

Data triangulation involves collecting data through numerous sampling strategies, so that segments of data at different times and social circumstances, as well as on a variety of people, are gathered. This study uses data from various SME managers in the UK service industry. This adds a variety of voices to the research and gets information from different people, both staff and managers in SMEs with diverse backgrounds and opinions; this gave the researcher in-depth information on SME information behaviour and factors that influence their behaviour during adoption decision making when adopting emerging ICT. Interviewing different stakeholder groups in SMEs enhance the data triangulation method in this study (Guion et al., 2011, Patton, 1999). See section 4.9.3 for participant profiles, section 4.9.5 and section 4.10 for sampling strategy adopted in this study.

4 7.6   Investigator triangulation

Investigator triangulation is the process of using more than one researcher in the field to gather and interpret data. Shenton (2004) explained how a researcher could apply investigator triangulation through various debriefing sessions between the researcher and their superiors,

for example, a project director or steering group. Having discussions with the team, the vision of the investigator may be widened as others bring to bear their experiences and insights. Such avenues can be used by the researcher to discuss alternative approaches, and others who are responsible for the work in a more supervisory capacity may draw attention to flaws in the proposed course of action. The meetings also provide a sounding board for the investigator to test their developing ideas and interpretations, and probing from others may help the researcher to recognise their biases and preferences.

This study was able to achieve debriefings by sending all twenty interviews to the supervisory team as explained in detail below.

During the preliminary study, the four interviews conducted were recorded and transcribed. The transcribe scripts sent to the supervisory team and the director of studies. Their critical feedbacks and expert advice widened the researcher's experience at the initial stages and throughout this study and researcher bias was reduced. The University has a policy that research students and their supervisors must meet at a minimum once a month, but in this researcher's case, we always met a minimum two times a month. But this was increased after more interviews were conducted, in total twenty interviews. These meetings helped the researcher a lot regarding data collection, data analysis, interpretation and findings because of the constructive critical feedbacks and expert advice from the supervisory team members.

4.7.7 Theoretical triangulation

Theoretical triangulation refers to the use of more than one theoretical position in interpreting data. Both deductive and inductive approaches were used for data analysis and interpretation of the raw data. See section3.3 to 3.5 on theoretical underpinning for more details on the deductive approach. The inductive process makes it possible to generate themes on information behaviour and influential factors through raw data.

4.7.8 Methodological triangulation

Combining more than one method for data gathering data, it can be between methods (mixed methods) or within methods. To established methodological triangulation in this study both between methods and within methods were used. As this study fits in interpretative research, it followed an inductive approach that is about qualitative research and interpretative study,

while the second method is a deductive approach that is always used in quantitative research to test a theory or develop a hypothesis in research. But in this study, the use of TOE model to design the research interview questions and data analysis followed positivism or quantitative approach. Secondly, both unstructured and semi-structured interviews are qualitative research methods.

4.8   Research data collection in qualitative research

4.8.1   Sampling strategy

Sampling strategy helps to classify participants who are qualified for the research. This is a procedure on how participants were recognised for the study. As it would be difficult to interview all the SME managers in the UK, a decision needed to be made about the potential participants for this research. The sampling strategy was based on the research aim and objectives as discussed in section 1.5. A decision needs to be made about who or what should be sampled, what form the sampling will take, and how many people or sites need to be sampled (Creswell, 2007). Qualitative research is usually not on probability but rather would use some sort of deliberate sampling (Punch, 2005). The main point or ideas for doing qualitative research is to "purposefully select" participants or sites that will best help the researcher comprehend the problem and research question (Creswell, 2014). Purposeful sampling is the process of deliberate selecting or sampling with some purpose or focus in mind (Punch, 2005). This study is an exploratory research, not to research on larger population for generalisation but to explore information behaviour of SME managers during emerging ICT adoption decision-making process in a social. The idea of some population to be always sampled prevails in quantitative research but is difficult in qualitative research to determine at the outset of the study. Glaser et al. (1968) introduced what is called "theoretical saturation" when no new things or themes emerge from the data analysis, the researcher should stop the data gathering. This argument was adopted in this research; after interviewing twenty participants and no new things were coming out from the data. As a result, the researcher stopped data collection.

4.8.2   Unit of analysis

According to Benbesat et al. (1987), the unit of analysis should be able to help the researcher answer the research questions; it can either be individual, groups (e.g., a task force, profit

centre, IS group) or an entire organisation. In making a decision on the unit of analysis, the research question should be examined by the researcher to decide whether the research is for generalisation or not. This research is not conducted to be generalised to a larger population instead it is to explore information behaviour of SME managers during adoption decision-making process in a social setting. The unit of analysis was individual-based (SME managers) because all the decisions on emerging ICTs in SMEs are usually made at the top level of the company because of their size and structure. Those who have adopted emerging ICTs in the last five years were interviewed. The participants were selected from the business services industry in the UK. The total number of participants interviewed was twenty from different companies in the service sector in the UK.

4.8.3   Purposeful sampling

Purposeful sampling gave the opportunity to choose participants that met the criteria desired and illustrated the features of interest as discussed above in the unit of analysis section, in order to achieve the aim and objectives of this study. A sampling decision should not only be on whom to interview or observe in qualitative research; but it must also include the settings, events, processes and actors. The research questions and a conceptual framework also play a significant role during sampling decision in qualitative research (Huberman and miles 1994). Furthermore, it involves finding and choosing an individual or groups of individuals that have knowledge about or experience with a phenomenon of interest (Clark and Creswell, 2011). Therefore, this informed the decision to select SME managers from the service industry in the UK that have adopted cloud computing or any emerging ICTs in the last five years. SMEs that have employed from 1 to 249 contacted through emails and telephone calls. The Justification for carried out research on SMEs discussed in section 1.2.

4.8.4   Snowball sampling

Snowball sampling (non-probability) allowed: the participants to be interviewed based on recommendations of the previous participants, not for statistical generalisations. After the first interview, the interviewee was asked if he knew someone that would help in this research: he introduced two participants, and one of the other two participants introduced the fourth participant. This process was followed in the preliminary study because of the time and difficulty in getting participants at the earlier stage of this study.

4.9   Preliminary study

The preliminary study helped to redefine the research topic and adopt another strategy for participant selections. This process helped in data analysis and interpretations of data. The initial four participants during the preliminary study also assisted in texting the interview as a data collection technique because during the unstructured interviews participants were allowed to talk freely without interruption.

4.10   Data collection procedures

4.10.1 Interviews

According to Polkinghorne (2005), qualitative research is an investigation designed at defining and clarifying human experience as it appears in people's lives. Data gathering in qualitative research is evidence for extracted descriptions. Data collection in qualitative research is primarily in the form of spoken or written language rather than numbers as in quantitative studies. Researchers using qualitative methods gather data that serve as evidence for their distilled descriptions

In choosing a particular research data collection technique, it depends on the researcher, research method, topic and availability of data. The second criterion is the extent which the researcher is proficient with a particular qualitative data collection technique (Myers, 2013). the appropriate data collection for this research is interview; according to Myers (1987) qualitative research involves the use of qualitative data, such as interviews, documents, and participant observations, to understand and explain social phenomena. An interview plays a significant role and is one of the data gathering techniques in qualitative research and researchers in business and management. Interviews as a data gathering technique in IS research are used in almost all kinds of qualitative research, such as positivist, interpretative, or critical. Myers (2013) pointed out that interview allows a qualitative researcher in IS to gather precious data from various roles and situations and rich data helped to connect in bringing to life the human beings that are the centre of social science research. Qualitative research interview is the most widely used qualitative research data collection (Polkinghorne, 2005). The interviewing research approach is clearly different from other research methods because participants are engaged in a direct or face-to-face conversation with the researcher. Interviewing allows the researcher to generate a deeply contextual, nuanced and authentic

account of participants' outer and inner worlds, that is, their experiences and this helps the researcher to get a first-person account of the participants' social reality (Schultze and Avital, 2011).

Myers (2013a) clearly stated the role of the interviewer during this process is to listen, prompt, encouraged, and direct and overall the more researcher makes. Overall, the more comfortable interviewees are, the more they are prepared to open up. (Myers, 2013). There are different types of qualitative research interview, but the most commonly used in IS research is semi-structured and unstructured interviews. But with the extensive use of qualitative interviews research data technique, the data collection technique still lags behind and is an unexamined craft data technique in IS disciplines according to (Myers and Newman, 2007, Schultze and Avital, 2011).

4.10.2 Structured interview

Structured interview comprises the use of pre-formulated questions, typically asked in a precise direction, and occasionally within a specified time limit. The perfect reason for using structured interviews is to ensure reliability across multiple interviews. A structured interview mostly used with the telephone interview, survey research, market research, and political polling, also in public places such as shopping malls (Myers, 2013). As a result, this makes structured interview not suitable for qualitative research because if it is too rigid and does not allow unearthing and exploring the real world of the participants. The other two types of interviews allow flexibility for the researchers and enable the interviewer to explore the real worlds and experience of the interviewees or participants in a study.

4.10.3 Unstructured interview

Unstructured interviews are the opposite of structured interviews. Unstructured interviews use appropriate pre-formulated questions. Unstructured interview for the preliminary questions based on the aim, objectives, and research questions of this study. The main technique used for data collection was informed by the literature review and the unstructured interview with open-ended questions, face to face and digitally recorded with the permission of the participants. As the interviews were progressing, probing questions were used to get more information from the participants. Myers (2013) stated that in an unstructured interview, the interviewees have free rein to say what they want but the interviewer has to

invent a few new questions. The unstructured interview initially used as data collection method, to understand the existing state of emerging ICT adoption decision-making process and information behaviour in SMEs, and have a comprehensive knowledge and exploration of the theory adopted for this research.

4.10.4 Semi-structured interview

Semi-structured interviews are in between structured and unstructured interviews. This involves the use of pre-formulated questions, but there is no strict adherence to them. Sometimes a new question emerges during the conversation, and such is encouraged. A semi-structured interview used for the next round of data collection and interview as one of the triangulation methods. The semi-structured interview allows consistency across the interviews because the interviewer usually starts with a similar question each time (Myers, 2013). The semi-structured interview questions were designed based on themes emerging from the preliminary framework for validation of the research framework to have more understanding of SMEs' information behaviour during the decision-making process. Both interviews were digitally recorded with the permission of participants. A total of twenty SME managers and staff were interviewed in this research, both unstructured and semi-structured interviews.

In summary, semi-structured and unstructured interviews were adopted in this study for data collection to enable the researcher to explore SME managers' information behaviour and decision-making process during emerging ICT adoption decision. Rich data can only be possible through conversation with the participants by sharing their experience with the researchers.

4.11 Designing of the interview process for this study

The guiding method for the interviews, both the unstructured and semi-structured, follows Myers and Newman (2007) interview procedure for qualitative research interview in IS disciplines. Their paper discussed the potential difficulties, pitfalls and problems of the qualitative interview in information system research. Using Goffman's seminal work on social life as theoretical underpinning, they developed a dramaturgical model as a useful way of conceptualising the qualitative interview. Based on this model the authors suggested guidelines for the conduct of qualitative interviews. The guidelines discussed below.

Table 4.4: Interview guidelines adopted for this study (based on Myers and Newman, 2007)

Guidelines	Description
1. Situating the researcher as actor	To situate themselves with the interviewee, the researchers should ask the following questions might be helpful: Who are you? What role are you playing? What are your background, experience, gender, age, and nationality?
2. Minimise social dissonance	Reducing the social distance between the subject and the interviewee so as to improve disclosure.
3. Representing a variety of "voices"	Researchers should include a variety of subjects in their sample at various organisational levels if appropriate. Interview different people.
4. Everyone is an interpreter	This guideline is to sensitise the researchers to the interpretive world of the subjects, the researchers themselves, and the audience they write for.
5. Use mirroring in questions and answers	Use mirroring in questions and answers. This guideline allows the researcher to use open questions rather than closed-ended questions.
6. Flexibility	The researcher has a minimal script and has to improvise most of the time, listening carefully and at the same time constructing the next question or prompt based on the subject's response.
7. Confidentiality of disclosures	It is important for researchers to keep transcripts/ records/ and technology confidential and secure. Permissions – obtaining ethics approval from the appropriate ethics committees, obtaining permission from interviewees.

4.12   Application of the interview guidelines by Myers and Newman (2007)

4.12.1 Guideline 1 Situating the researcher as an actor

For this research before the interview day, emails were sent to the participants with a detailed outline of the research aim and research questions to be expected on that day. The purpose of the interviews was explained to the participants clearly: that it is for an academic purpose not for market or any competitive research. This acquaintance was essential not only when selecting our interviewees, but also in establishing social relationship before the interviewing day. The emails were sent to those that agreed to participate in the research. A total of twenty people agreed to participate after 250 emails were sent to them earlier inviting potential participants for the study. There is a need for introduction from sides, interviewer and participant. Before the interview started participants were asked preparatory questions in

order to familiarise with them and established a relationship with them. This introduction gave the opportunity to ask the participants questions on their background relation to the company and many other questions that let the participants know that the interviewer is interested in the participants not just interviewing alone. The interview is a social encounter between the participants and the researcher. Therefore, the interviewer must approach participants as a well-informed person in order to have participants' organisation information and achieve the aim and objectives of the study. Table 4.5 shows the interview introduction questions in order to familiarise with the participants and establish a relationship.

Table 4.5: Interview introduction questions

Guiding questions
1. Please, can you tell me about yourself and your role in the company?
2. What is your company doing?
3. When was the last time you adopted an emerging ICT such as cloud computing?

4.12.2 Guideline 2 Minimising social dissonance

Details of supervisory team members were included in the emails sent to the interviewees earlier, before the interview day in case they had anything that is not clear to them. Formal dress was appropriate as some of the interviews took place at the participants' offices; most of the participants are owners and senior managers in SMEs: this informed the decision to dress formally on the interview days to make a good impression on that day. Most of the companies contacted turned down the invitation to participate in the research interview because of their busy schedule. Those that agreed to participate in the research interviews were informed of the maximum time limit, and most of them were happy to participate. Participants' time was respected; as a result, all the interviews lasted for 45 to 60 minutes, as they were told before the interview day. These initiatives proved useful as most of the participants opened up and discussed their experience and types of information they require during the decision-making process. Secondly, some of the participants were ready to contribute more and asked to call back for any information that might help the progress of this research because of these initiatives.

4.12.3 Guideline 3 Representing a variety of "voices"
To apply guideline three, criteria were introduced that enabled a range of voices to be represented in this research. In qualitative research a diversity of people helps to avoid elite

bias (Huberman et al., 1994, Myers and Newman, 2007); the idea is not to try to force one voice to emerge as all the respondents are not the same (Myers and Newman, 2007). The first criterion was to interview other participants than SME managers alone. As most of the strategy decisions are made at the top or senior management level, senior SME managers were interviewed in the preliminary study (see Table. 4.5). It was discovered from the initial research that other people participated, especially their IT staff or the personal assistant to the CEO and it was decided to interview them, too, because a suitable participant is one who has the knowledge and experience of the subject under study (Duan et al., 2009). Secondly, participants were selected from different regions in England instead of selecting them from the same area. This added another variety of voices from participants in other regions; see tables 4.5 and 4.6 on participants' profile. Those that have not adopted but had adopted one of the emerging ICTs in the last five years were interviewed. This was important in order to study information behaviour of SME managers when adopting emerging ICTs because of unpredictable technology, organisation and environmental changes that affect adoption decision-making process. Lastly, participants were selected from the services industry in England, such as financial firms, security services, IT consultancy, training centre etc.

This makes it possible for various voices to be represented from different companies; the idea was not for generalisation and provided the needed answer to the research questions. To improve possibilities of finding SMEs that have adopted emerging ICTs and increase the chances of adding various voices in the research, more search engines were searched; apart from the local search engines as such FAME (Financial Analysis Made Easy) provides financial information on major public and private U.K. and Irish companies. Secondly, contributions of the services sector to the UK economy and job creations are another contributing factor of selecting participants from this sector. According to Rhodes (2014), service industries accounted for 78% of employment and 68% of total turnover in the UK. The decisions on emerging ICTs in SMEs are made at the top level because of their size and structure.

Table 4.6: Participant profile for the preliminary study

UI Number	Role	Company size	Sector	Business location
SM1	Owner	100	Security services	Coventry
SM2	Owner	25	IT software development	Northampton
SM3	Owner	50	Telecommunication	Birmingham
SM4	Head of operations	2	Telecommunication	Birmingham

Table 4.7: Main study participants' profile

UI Number	Role	Company size	Sector	Business location
SM5	Managing Director	50	IT software development	London
SM6	Director	10	Training and development	Luton
SM7	Director	100	Security	Forest Gate
SM8	PA to CEO	35	Financial firm	London
SM9	Site Manager	50	Engineering/Telecommunication	Luton
SM10	Branch Manager	30	Retails	Luton
SM11	Owner	20	Telecommunication	Luton
SM12	IT manager	65	Security	London
SM13	Managing Director	10	Property	Bedford
SM14	Manager	15	Property	Bedford
SM15	IT Director	25	Consultancy	London
SM16	Owner	5	Money management	Cambridge
SM17	Owner	1	Internet marketing	London
SM18	Business analyst manager	20	Financial firm	London
SM19	Operational Manager	5	Security training	Cambridge
SM20	IT manager	70	IT consultant	London

4.12.4 Guideline 4 Everyone is an interpreter

Interpretive research does not predefine independent and dependent variables and determine contributory relationships between them. Instead, the aim is to understand the complexity of human sense-making processes, and the processes by which inter-subjectivity is obtained as the situation is constantly changing (Nicholson and Sahay, 2004). As the research based on interpretative research philosophy, it gives us the opportunity to study the meanings, explore and have an understanding of the participants' information behaviour during decision-

making. In their words rather than having pre-conceived ideas before the interview day. The aim was not to study why emerging ICTs fail in SMEs but to explore information behaviour of SME owners during this process in a social setting because information is an essential tool in decision-making.

4.12.5 Guideline 5 Use mirroring in questions and answers

Twenty participants have interviewed altogether; the interview questions were open-ended, face to face and digitally recorded with permission of the participants. The open-ended questions gave the opportunity to listen to the participants' view and direct them through pro-questions; this encourages a deeper conversation between the researcher and participants. Open-ended questions give participants the opportunity to express their views on aspects they consider of importance and free rein to say what they want, but the interviewers have to invent a few new questions (Myers, 2013). These questions were designed according to the literature review, aim, objectives and research questions formulated earlier to refine and validate the research framework. The open-ended semi-structured interview questions were used for further development, reliability and validating of the research framework but not for statistical generalisation. The questions were attached as a document to those participants who agreed to participate in the research. During an interview, this was used for guiding questions as more questions were asked based on the interviewee answers.

4.12.6 Guideline 6 Flexibility

It was discovered from the preliminary study that not only the SME owners make adoption decisions in their organisation; some of their staff and managers that are experts in ICTs assisted them. This informs the decision to interview some of the staff in the semi-structured interviews; this makes it possible for various opinions to be respected. Open unstructured and semi-structured interviews were designed to guide the interview. The initial unstructured interview questions for the preliminary study were adjusted to accommodate new findings. Thought was also given to the phrasing of the semi-structured interview questions to avoid obscurity and jargon that would discourage participants and make them uncomfortable. This helps the participants to express their thoughts on the subjects additionally and feel comfortable.

4.12.7 Guideline7 Confidentiality of disclosures

The ethics committee of the University of Bedfordshire gave the go-ahead for the interviews. The participants were given the option to cancel the interview or an appointment if they felt Uncomfortable at any moment before or during the interview and confidentiality issues discussed before the start of the interview. Before the interview day, the consent form was attached to the email sent to the participants seeking their permission for digital recording of the interviews and other issues related to the interviews. Some contacted through telephone calls for their consent. The consent form and research questions allowed participants to make their findings and feel more comfortable during the interview period. According to Oates (2005), it is advantageous to send the questions in advance so the respondents can think through their views and help establish the researcher's credibility. The interviews were recorded with participants' permission and the signed consent form and all transcribed. Nvivo 10 was used for the data analysis technique. Transcribing helps in the data management and when using NVivo10 during data analysis.

In conclusion, this chapter has discussed the research method, research rigour and quality, data collection process and interview guide adopted for this study. The next chapter discusses the data analysis process and the use of Nvivo 10 as part of data analysis process for this research.

CHAPTER 5 Data Analysis

This chapter reports the data analysis techniques. It explains how codes and themes were generated, tested and verified. The major aim of qualitative research is to reduce, manage data in other to interpret and make sense of the data by the researcher (Bryman, 2012). Clarke and Braun (2013) argue that thematic analysis be an analytic method because of its theoretical flexibility rather than methodology. In the process of reducing the data, identifying and analysing patterns thematic analysis data was used, and this also allows the researcher to be flexible in the data analysis process. Thematic analysis according to Clarke and Braun (2013) is essentially a method for identifying and analysing patterns in qualitative data. Because of the controversial and academic debate on grounded theory, some scholars argue that be a data analysis process while some seen it as a qualitative research method. Some researchers claimed that the researcher using grounded theory must not review literature before data collection and analysis. As a result using grounded theory in this research will not avail the researcher opportunity to review literature before data gathering and analysis which is almost impossible grounded theory was not utilised in this research. neither as a research approach nor data analysis, This study used Braun and Clarke (2006) guidelines for data analysis as shown in Table 5.1.

5.1   Data analysis techniques

Table 5.1: Phases of thematic analysis adopted in this study

Phase	Description of the process
1. Familiarising yourself with data	Transcribing data (if necessary) reading and re-reading the data, noting down initial ideas.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating codes into potential themes, gathering all data relevant to each potential theme.
3. Searching for themes	Collating codes into potential themes, gathering all data related to each potential theme.
4. Reviewing themes	Checking if the themes work about the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes	On-going analysis to refine the specifics of each theme, and names for each theme.
6. Producing the report	The final opportunity for data analysis. Selection of vivid, compelling extract examples, the final analysis of selected extracts, relating back to the analysis of the research question and literature, producing a scholarly report of the study.

5.2   Data analysis process

5.2.1   Phase 1 Familiarising yourself with data

The process of familiarisation in this study began when transcribing the interviews one by one. This process allows the researcher to read and reread, checking if what was written down corresponds with the actual words spoken by the participants; as a result, more time was spent on reading the transcripts again and again. According to Lapadat and Lindsay (1999), the close attention needed to transcribe data may facilitate the close reading and interpretative skills required to analyse the data. According to Braun and Clarke (2006), it is important to check the transcript back against the original audio recordings for accuracy. The transcription scripts were sent to the supervisory team for them to read through and their advice. Any questions asked by the supervisor team triggered another round of reading and checking with the audio recordings. These enhanced the familiarisation with the transcripts.

5.2.2   Phase 2 Generating initial codes with the four interviews

It is significant to discuss the approach used in data analysis before starting to discuss the data analysis process. The data was analysed following two approaches inductive and deductive. The inductive approach was based on the information behaviour of SME

managers, a bottom-up approach, while the second was a top-down theory-driven approach. The hybrid process is a combination of inductive and deductive approaches during data analysis in a study (Duan et al., 2012, Fereday and Muir-Cochrane, 2008). In an inductive approach, the themes are strongly linked to the raw data themselves. In this method, the data have been collected specifically for the research, e.g., via interview or focus group (Braun and Clarke, 2006). Precisely, the twenty interviews in this study were conducted using unstructured and semi-structure interviews.

The deductive approach is a theoretical or top-down approach (Braun and Clarke, 2006, Hayes, 1997) where a theory is used to underpin the study; the theory that underpins this study is TOE. The initial codes for this study were started after the four interviews for the preliminary study and later NVivo 10 was used to code the remaining interviews. The use of NVivo 10 helps in the management of data and transcripts. The initial codes were generated during the preliminary study through traditional methods of tabling, cutting, pasting, and sorting from the interview transcripts. See Appendix 4 for the initial codes. The research questions, objectives, literature and aim of this study guide during the inductive approach while the TOE model guides in the deductive part. A highlighter was used to identify patterns while raw data were copied from the transcripts to tables to match the codes. A different folder was created in other to store these codes as they emerged during this process. For the purpose of thematic analysis process in this study, initial codes were generated to define different themes. These codes were created from the transcripts directly from the participant's words without any influence from the researcher. Some of the definitions of the codes and meaning were informed from the literature review. However, in NVivo 10 transcripts were from a folder created on the laptop to sources in NVivo10.

5.2.3   Phase 3 Searching for themes

This phase saw the combination of different codes from the interview transcripts to form potential themes and raw data (quotes). The codes collated into different relevant themes in NVivo (nodes). Themes and subthemes identified, and raw data that were related to them were put together besides the themes. See tables in Appendix4

5.2.4 Phases 4-6

Table 5.2 Overall descriptions for predefined code from TOE framework

Technology	Technology context in this research stands for that both external and internal information SME managers considered before adopting emerging ICT in their company. These factors are relevant to their business successful adoption decision-making, but there are not enough or lack of information on those factors after or before they adopt the new technology. It also includes the internal and external technologies those are that appropriate to the company. These include both the equipment and processes in an organisation.
Organisation	This has significant factors that would influence adoption decision making and it can be a challenge as well which can trigger information behaviours of SME owners; such as resources, structure, size, skills and top management attitude and prior IT experience.
Environmental	Environmental context refers to both the internal and external forces and changes that have an impact on organisations decision-making process. It could be the surrounding where a firm conducts its business; regulatory environment company competitors, technology advancement and globalisation. As a result, these have some level of uncertainty during adoption decision-making process which made information during this process.
Information behaviour Themes	
Information behaviour	Information behaviour is the process on how information users meet the information need, requirement, seek, gather, use, manage information and sources of information during decision-making process or when a situation arises that create a gap in their knowledge on what they know.
Influential factors	These are factors that influenced small and medium enterprises owners' information use and information sources selection when they scan the environment and seeking for information in other to reduce uncertainty and complexity during emerging ICTs adoption decision-making process.

The process of reviewing the codes involved having subthemes and themes and supporting data. The definitions based on the theoretical underpinning, literature review, aim, objectives and research questions as well. Those themes that had a significant number of quotations to support them are discussed in the findings and were created based on the themes discussed earlier. Furthermore, themes were also designed for theoretical concepts in the in preliminary interview, and used for categorising themes and subthemes that match with the definition of a theoretical concept as shown in table...?? The subthemes were also created inductively as themes and subthemes emerged during data analysis. The themes and subthemes have already been defined before the coding process using TOE model.

In summary, Clarke and Braun (2013) stated that the process of data analysis must not be seen as a linear model, where one cannot progress to the next phase without concluding the prior phase (correctly); rather analysis is a recursive process. The next section discusses how NVivo 10 was used for storage and analysis in this study

5.3   Using NVivo 10 for data analysis

The interview was data analysed following thematic analysis process of according to Clarke and Braun (2013), it can be applied to produce data-driven or theory-driven analyses; i.e. inductive and deductive approaches. The assistance of computer-assisted qualitative data analysis software programme (CAQDAS) was used, because of the usefulness of CAQDAS in assisting a researcher using a qualitative method to analyse a large volume of qualitative data (Myers, 2013). NVivo is one of the CAQDAS that is used to analyse data in qualitative research. This proved NVivo 10 as a useful tool for analysis of this study because predefined and new codes created in it. The process of analysis using NVivo 10 in this research firstly involved importing the twenty transcribed interviews into internal sources in NVivo. See figure 5.1 for illustration.

Figure 5.1: Data import to NVivo

5.4   NVivo Nodes

The nodes in NVivo represent the codes in this study. Secondly, as the research is using deductive and inductive approaches for data analysis, predefined and new nodes created from the imported transcripts. The nodes that were related were merged to form the themes, used to classify participants' profile and references in this study. The process of coding was quicker because (Braun and Clarke, 2006), thematic analysis was done manually in the preliminary study before the main study. Figure 5.2 shows different nodes created.
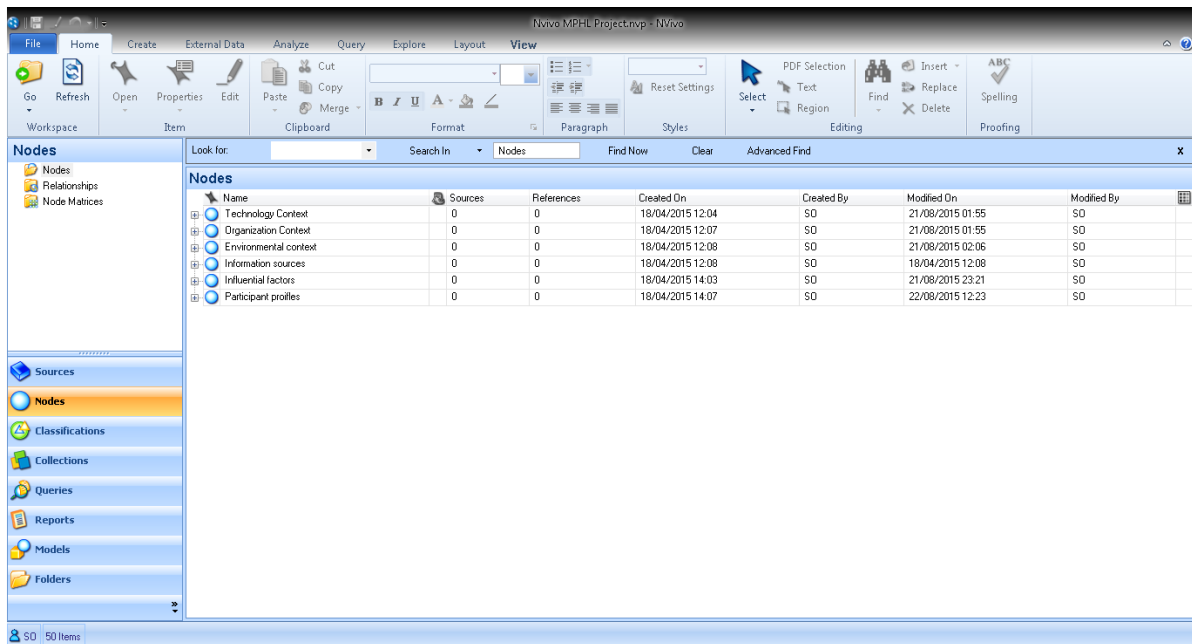
Figure 5.2: Nodes created

5.5　Allocating raw data to nodes

Raw data from the interviews were used to support the nodes in NVivo 10; these raw data were from the participants already imported into sources in NVivo in the early stage. It also prevents data being allocated twice during the process. This was valuable because the nodes reflect on the language of the participants and their information behaviour during adoption decision -making process and factors that influence their behaviour.
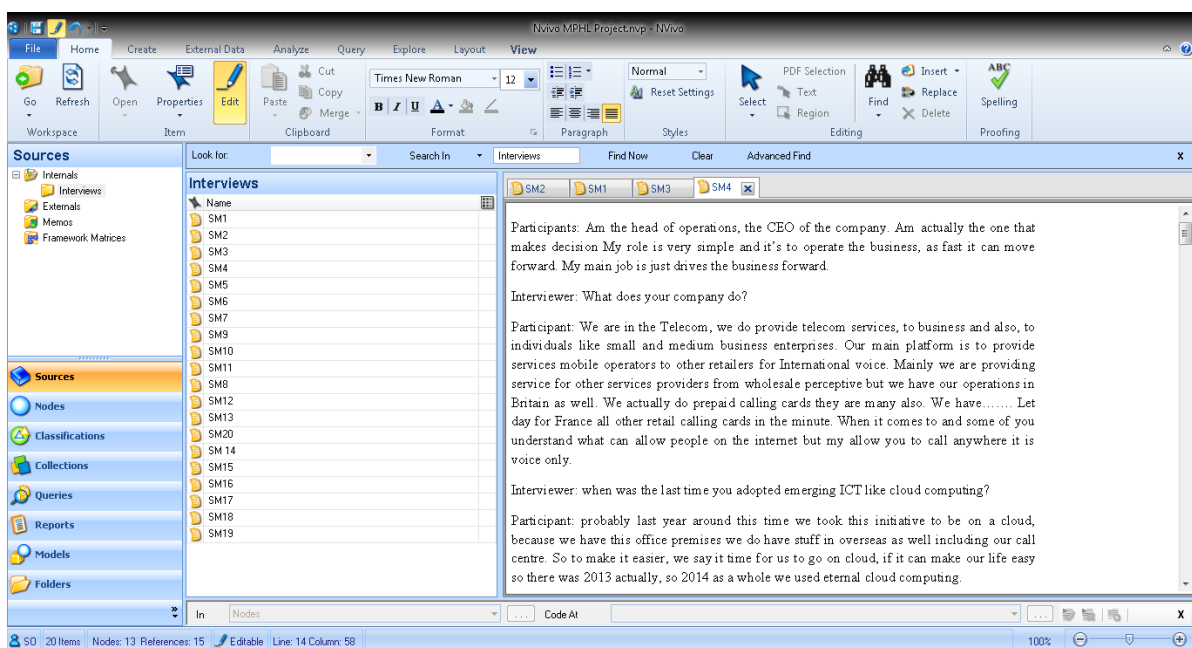
Figure 5.3: Interview data transcripts in NVivo

5.6 Text query and chart

Queries were used to gather and explore subthemes in the data and checked for consistency in the research findings. The query was useful in supporting the findings from the transcripts.

Figure 5.4: Query and chart

CHAPTER 6 Research Findings

6.1   Introduction

This chapter reports the findings of this research. The previous chapters have discussed in detail the research philosophy, research methods, sample strategy adopted and data analysis. All this leads to the findings of this study. This chapter presents the rigorous results of the extensive data analysis, interpretation and findings. Secondly, a detailed descriptive analysis of all the themes investigated in the study using the TOE model to investigate information behaviours of SME managers, including the interpretation and discussion of the findings, are discussed. Some of the themes are generated from the TOE model on perceived information needs, as discussed from section 3.3 to 3.5. This section also explains the information behaviours about emerging ICTs and the key influential factors on information behaviours as shown in Figure 7.1.

6.2   Technology context of perceived information needs

6.2.1   Uncertainty driven

According to the participants, various issues arose during adoption decision-making process that triggered them to seek information, such as uncertainty about employee behaviour towards the use of the emerging ICT, productivity improvement after the technology has been adopted or whether there is any need for them to adopt it in the first instance. These and more questions concerning the emerging ICTs triggered their information behaviour. Consulting with their employees, customers or accessing their existing technology was a widespread information activity of most of the interviewees during the decision-making process.

> *"Yes, we can talk about technology uncertainty about the employee behaviour…"*

> *"Do we need to implement certain technology that could not enhance the experience of the learners? …other resources sufficient for our staff to be delivering with, all these factors when you put them together uncertainty will come out that would be triggering point to go and looking for certain system…"*

6.2.2   Compatibility

It was noted that participants sought compatibility information during adoption decision-making process. According to the participants, they needed to know whether the emerging ICT can work with their existing technology without spending more money on training their

employees or altering the existing technology. Knowledge on Emerging ICTs on whether it would complement the existing technology during adoption decision-making process would felicitate the decision and implementation.

> *"The performance of the server without altering the existing application you have or without the need for you to start thinking to buy a bigger infrastructure." SM3*

> *"We do the compatibility test, and we do cost evaluation analysis." SM8*

It shows that SME managers gathered information during adoption decision-making process and used the information to build a business case. Therefore, a compatibility test is a significant activity SME managers performed and is one of the issues that triggered their information behaviour. Furthermore, this provides the opportunity to assess the ability of their staff using the emerging ICT and existing technology.

> *"We would check the capacity of the IT department with existing infrastructure all this information we will use to build a standard business case." SM16*

6.2.3 Legacy technology

The emergence of a new technology required participants to seek for information on its impact on their business during the decision-making process. The findings show that it is important to scan the environment during this process. According to the participants, business growth and technology advancement put significant pressure on them to search for information on new technology to replace the legacy technology they are using.

> *"Once they identified this new technology they can now match it with our existing technology and say that is what we have either better or worse and present it to the business and say use it." SM8*

The participants deemed it was compulsory for them to implement a new technology in their company rather continue doing it manually. As a result, they attended exhibitions and research on emerging technology for adoption. This is a triggering point for them during adoption decision-making process or activities.

> *"Then we said no the company has to go more to ICT base, rather than just normal manual. We can find out, throughout the years we have been developing more and*

more into better systems for us. At some point, we used to have typewriters before."
SM7

6.2.4 Relative advantages

According to the participants, they want to know how the new technology will support them, regarding delivering the best product and provide the best service for their clients after adopting the new technology compared with competitors. Secondly, if the emerging ICT will make them more superior to their competitors in the industry regarding ease of use for those clients who are not that conversant with using such new technology and the benefits to their customers after adoption. They gathered information on how the technology is suitable for their organisation, and how it will improve efficiency and performance of their staff and customers' satisfaction

> *"Efficiency is paramount, paramount. You need to be able to deliver things quickly to the customers …but it is fantastic now with technology." SM5*

The participants seek emerging ICT that will assist them to gain competitive advantages, and efficiency is very crucial for them. As a result, they need information on a new technology that can meet the business strategy regarding technology

> *"We see that there is something missing from our training, or our services will provide that could benefit learners. These are factors that would trigger us to look for further information." SM6*

6.2.5 Lack of technical know-how

According to the participants, how to implement the new technology is one of the biggest challenges they faced during adoption decision-making process. That triggers their information needs and environmental scanning during this process. They have limited knowledge on how to implement this technology or how it works. Secondly, because of limited resources and IT personnel, there is a need for information. To deal with the issue associated with the implementation of the new ICT, participants started looking for an expert to help or guide them through.

"If it is with new technology we have to look whether or not it falls within our skills. Either we are capable of delivering that particular stuff to the customer or not; if we needed a specialist assistance to provide that to our customer or not." SM1

It was discovered from the participants that SME staff sometimes lack the skill to implement the new ICTs their company wants to adopt. Some lack the practical knowledge on this new ICT, as a result of lack of technical how the managers seek for information on how to implement, keep their data safe, the maintenance of it and operate it more efficiently. The knowledge and skill required must be identified during this process.

6.2.6 Perceived affordability

There are a lot of questions and apprehensions about the cost of the technology and their budget. Can they make any saving from implementing it or using the technology? According to the participants, it was discovered that cost was of one of the factors and reasons they were seeking and gathering information before making a decision.

"We try to find out the benefit in relation to the cost if the cost is excellent, very low and the benefit is very huge then we are going to go for the adoption of the new technology." SM1.

Inadequate financial resources and limited skills sometimes obstruct SME managers from making effective adoption decisions on ICT adoption. However, knowing the cost of an emerging ICT helps SME managers make more effective decisions and evaluate the need for emerging ICT in their organisation.

"Another factor that helps me to make a decision is the price. Is not everything that is expensive is good? As a small medium organisation, we need to work on a budget." SM2

6.2.7 Fit for purpose

It was established from the participants that most of them desired to know how the ICT is fit for purpose, how it can help them in their various businesses and operations. The participants checked with the technology providers their requirement, if the technology is fit to be used for a specific purpose agreed with the provider or how it is relevant to their business. It is not

reasonable to rely on the information from online forums without checking with the technology vendor. Making sense of this throughout a decision process is good according to the participants; it supported their adoption decision-making process.

> *"Eventually, we called up the hosting company to tell them our requirements and asked some questions; could you do these, are you sure the server will be online 24 hours, can I increased the RAM?" SM3*

According to the participants, the emerging ICT must be good enough to perform the functions it was designed to do. The participants said they needed clarification from the provider during decision-making process to clarify this important factor before making the final decision.

> *"The reason anyone would gather information ahead of the business case is that… otherwise, you are on a risk of implementing or adopting a new technology which is not suitable for the business." SM8*

6.2.8   Perceived risk and security

According to the participants gathering information on the emerging ICTs, security/ risks will lead them to a better adoption decision. Participants talked about risks and security of the new technology. What are the drawbacks from adopting the technology? Can the technology providers protect their company data from hackers?

> *"How safe is it to have our client data on the cloud or save on a cloud-base technology. So we just need something that is reliable and efficiency." SM6*

The finding discloses that participants always gather information on how the emerging ICT is safe, the security implications of their data. Security is an unsolvable task faced by the participants during adoption decision-making process.

6.3 Organisation context

6.3.1 Users' acceptance information

The participants communicate the emerging ICT to their staff during adoption decision-making process; because the information from the staff influenced their decision and cleared uncertainty towards this new technology.

"Knowledge feed and briefs them properly so that they understand the technology and appreciate it, they can make their point out clearly and loud." SM4

"Internally is to discuss it with the IT department people who worked in the ICT which have more knowledge in the field, basically to elaborate on the uncertainties we have." SM6

Discussing with their staff is one of the activities that happened during this process, and SME managers' uncertainty was clarified from the information they got from their staff.

6.3.2 Efficiency driven

Another finding was whether or not the emerging ICT will improve their operation; this is another triggering point for them. To satisfy their customers, improve their operation and automate the process, these are other major factors they considered before adopting any emerging ICTs, according to the participants.

"How can they improve our day to day operations? How can they make my work more efficiency and how we can work better?" SM5

"Yes, with time technology is moving very quickly and our learners need to have best experiences. We see that is there something missing from our training or our services that could benefit learners. These are factors that would trigger us to look for further information" SM6

The participants have many questions on how the emerging ICT will improve their performance, improve the company efficiency and functionality; these factors triggered their information behaviour during adoption decision- making the process of emerging ICTs.

6.3.3 Industry innovation growth

From the informants, it was noted that the industry SMEs belong to play a significant role, during adoption decision-making process in SMEs. Emerging ICTs have a dramatic impact on the SMEs and industry in which they compete, according to the participants.

"The whole technology has been redefined and come out better in an advanced way, everyone wants to meet up in the industry. Want to keep updating themselves in the industry, so you have to move up that is what is happening in the industry"

6.3.4 Owner's support

The managements seek information on emerging ICTs that would improve the company relationship with their customers and create a better working environment for their staff.

> "We are also very positive, and patience is in about getting access to new technology, exploring new things more of automation stuff to reduce human input." SM4

It was noted that when there is sufficient information about the new technology during adoption decision-making process, the management is happy to adopt.

6.4 Environment context

Given today's unpredictable economics and technological development changes, both small and medium enterprises needed information to survive in this situation and make the adoption decision. Environmental scanning is one of the tools to find out more about technology that SME managers use during decision-making process when adopting emerging ICT; the opportunities, strength and weakness of the new ICT.

6.4.1 Competitor's intelligence gathering

Participants explained that scanning the environment for information on new technology assists them to have an understanding the role of innovation in relationship to their competitors, and customers. As emerging ICT helps a company to remain in business or grow faster in this globalised world. Evidence from the interviews had proved this, and it is one of the reasons they looked for information on types of technology their competitors are using to have competitive advantages by integrating new technology into their operation. They considered how the new technology can support them to stay on top and how to meet their clients' need. Environment scanning provided useful information on the strength, weakness, opportunity and threat of their competitors concerning emerging ICT.

> *"The benefits and functions there would be competitors' research."* SM8

> *"Your competitors as well because you have competitors who shape your company because you want to be better than your competitors and most of this times you have to look into existing technology of your competitor."*

6.4.2 Customer's information gathering

Small and medium enterprise owners adopted new technology to fulfil their customers' requirement. Meeting customers' requirement is another challenge and how to use emerging ICTs to achieve this, is another considerable factor. Information has to be gathered on customers' requirement, satisfaction, want and need; and can they use the emerging ICTs to meet the requirement.

> *"For us, most of it depends on our clients' requirements, for us generally, because we have many clients we work with and depend on, what their mind wants." SM3*

> *"You need to be able to deliver things quickly to the customers, but it is fantastic now with technology." SM5*

Participants carefully considered the role of ICT in fulfilling customer requirements before the final adoption decision is made.

6.4.3 Provider credibility

Most of the participants are careful before selection of ICT provider because of the numerous ICT providers, to afford the risk of the ICT provider going into liquidation or administration after they have adopted the technology. This persuaded them to seek for information on technology providers during adoption decision-making process.

> *"If you don't scan the environment very well in the industry to determine the true provider, people who can actually provide you that technology and adequately guarantee you 100% quality of that technology…, I think you will be making a mistake just jumping into conclusion that this is the company you are going with" SM12*

> *"Industry for ages so throughout this period they have been in the industry, people had seen their performance, people can testify to the strength of the company." SM1*

> *"If companies bigger than mine size already using the same cloud providers automatically the trust would be there, you have enough reason to for it." SM1*

> *"We went online to look into the strength of the business. Moreover, we saw it is a company that gave us the confidence." SM*

"No, you know before we took them on board, we did a great cheek on them so the account, so they are trading well, they have a good client, if they can be able to have a good client working for BT and the rest." SM3

"If I checked Google search and I can see that the system is okay or technologies had not got a bad review then. It would help me to make my decision." SM

From the empirical data, it was found that SMEs did a thorough investigation on the ICT's provider, seeking for information on the credibility of the company, functionality of their systems compare with their requirement and year of existence of the provider. These are the factors or information that contributed to signing a contract with the company. Trust and performance of the technology provider remain the most significant influencing factor in the SME managers' decision-making process, regardless of the kind of emerging ICT, being deliberated because technology itself does not build trust.

6.4.4 Technology market growth

SME managers indicated that they would adopt emerging ICT that would assist them to meet their target customers and show their internal competency to their customer. That is the type of technology they are always searching for.

"I remember we started very small scale as soon as we are looking at the potential of the market we brought different technology." SM4

The participants scan the environment to have knowledge of the market situation during this process. The reason for doing that was to know the strength and weakness of their company and plan for their survival using emerging ICT as a survival strategy technique. Secondly, this gives them the opportunity to discover technology trends in the industry; and having an understanding of their competencies within the market and industry.

"There is a market we can see. The existing solution we have now is compulsory everyone has to login into the internet then send a text to reach another part of the world. We are market driven what so ever that we move us to next level that is what we are thinking about." SM3

6.4.5 Government policy

The data from the participants shows that government regulations were taken seriously when adopting an emerging ICT. The Data Protection Act is one of the regulations participants always considered during adoption decision-making. From the participants, government regulation can stand as a hindrance to adoption. When considering adopting an emerging ICT, the participants deliberated government policy concerning information technology communication.

> *"You might be looking into government policy about government data protection." SM1*

> *"Is there any bearer from the government? Is there any legal legislation in place for, that could also give us hindrance, to accept it, adopt it or to take it as a whole?" SM4*

6.5 Sources of information

Information comes practically from any place such as media, blogs, personal experiences, books, and journal and magazine articles, and expert opinions. The type of information sources will depend on the task, situation, or decision the decision-maker is making. It can be personal or non-personal, internal or external source of information when scanning the environment and acquiring information. The findings from the study showed that SMEs managers use different sources of information when seeking for knowledge on the new technology, during technology adoption decision-making process. Part of the activities involved in information behaviour of SME managers are seeking for, reducing uncertainties, acquiring and use of information during adoption decision-making process; to reduce the uncertainty associated with emerging technology. SMEs managers use both internal and external sources of information when scanning and seeking for information. Below are the concepts that form these themes from the data collected and analysed.

6.5.1 ICT professional event

Participants went to various technology trade shows or exhibitions to get more information about the existing technology or the new ones that are coming out. From the interviewees, this sort of event is a great source of information on emerging technology for them. Some

encourage their staff to attend. The participants said many companies are there to showcase and demonstrate their competency and show their emerging ICTs.

> *"We went to trade show, seminar there is one in Chicago next month, there is one in Dubai, and there was one in London a few weeks ago, where the technology provider came and exhibit actually, show things and how things are moving." SM5*

> *"Our guys locally, nationally in the field go out and sale, go to the exhibition, etc., not just in our field but another area as well. Looking for a new thing we can adopt that is good for us." SM9*

6.5.2   Expert as a source of information

According to the participants, they relied on experts in the industry to get information on emerging ICTs, and sometimes this expert could be external or internal, for example, their IT staff or IT subcontractor they are engaged with.

> *"Externally is to consult the expert in the field to discuss it with the company that knows the systems to the depth and clarify our uncertainties." SM6*

> *"But, you know most of our information about new technology comes from our ICT subcontractors they give us information about new technology."SM7*

> *"We are in technology world anyway, but we have to basically, be consulted by those companies that want to deliver services new to the world, emerging technology." SM9*

Evidence suggests that SME managers attended exhibitions in different countries seeking for information on emerging ICTs to reduce uncertainties concerning new technology or challenges they encountered during this process.

6.5.3   Online professional community

Such communities serve as a source of information during decision-making process of SME managers, according to the participants. The feedbacks of members of such forums were used by the participants to decide whether or not to adopt the emerging ICTs. The interviewees have first class information from those that have adopted through these forums.

> *"We have forums; look information these days is just a matter of click, you know, it does not take you that long." SM4*

"By searching Google, Yahoo, also by forums and other people that have adopted this technology you can see from their experience and how they have done as well." SM10

6.5.4 Employee as a source of information

The results illustrate that SME owners shared information with their staff and encouraged it in their workplace when they needed any information or to reduce uncertainty during information seeking and environmental scanning. SME managers asked or sought the opinions of their employee during adoption decision-making process. People work together to solve a problem not because they are weak, but it is often the most efficient way to share information and make a collective decision; this shows all mutual respect and boosts employee morale.

"I would then pass it on to my IT team, and the IT team will look at it. It comes from me as the CEO to the IT team, and they get back to." SM4

6.5.5 Word of mouth

The providers of these emerging ICTs take active steps by informing the participants about their new product that is coming out. The evidence from the interviewees shows they place a significant value on the information from the providers during adoption decision-making process. The providers went to various SME offices informing them of the new technology that is coming out, the advantages, how to implement. Sometimes the interviewee calls the provider to seek information on the new technology or the challenges of implementing it.

"if it becomes necessarily sometimes I call them to try to know them and whether there is any concern about it or facing any challenging introducing a new thing a kind of feedback from them, transparent feedback." SM4

"I think mostly like word of mouth recommendations…what the industry is doing now." SM5

6.6   Influential factors

6.6.1   Information usefulness

If a particular source helps an information user at a dilemma stage during adoption decision-making, this might compel the person to reuse the information sources again and again when such a scenario occurs again. The findings suggest participants' sources of information were influential because of the usefulness of the information they got from the sources when making adoption decision making. Secondly, the usefulness of information determines it effect in decision-making, either to adopt or reject the emerging ICT as suggest by the data analysed.

> *"The information we got from customer service of 1 and 1 in those days was useful to us. Because immediately they told us or you did not need to do anything just set up a direct debit." SM*

6.6.2   Openness to other people's experience

In situations of uncertainty and when the participants are uncertain of which choice to make they rely on earlier adopter experiences for them to make their decision, and reduce the burden created by the complexity of the emerging ICT as noted by the evidence. The participants were open to other people's information based on their experience which sometimes can be got on the Internet, conferences, or?

> *"That would help you to avoid these much critical... options that you have once has been recommended by someone that clicked the button." SM4*

Emerging ICT decision-making is a complex process that involves gathering information on that particular ICT before adopting it. The participants' acknowledgement of the challenges and openness to other people's experience is the first step to reducing the uncertainties and complexity associated with the new ICT. The associations with early adopters add intelligence to the understanding of the emerging ICT, as well as having information supported the participants to make an informed adoption decision. It is strong and good for SME managers to rely on information from and openness to early adopters' experience

within their industry, according to the participants. The participants were ready to consider information on emerging ICT from different sources especially the early adopter of this new technology.

6.6.3 Perceived information sources credibility

The data suggests confidence on information sources noticeably influence the decisions of the SME managers during adoption decision-making activities, as this was mentioned by most of the participants. Where the information is coming from is another dilemma a decision-maker is facing during decision-making activities when adopting emerging ICT. Most of the participants had confidence in the sources of information they are using. Different technology providers post information on the Internet or go to exhibitions to showcase their expertise, but this increases challenges faced by decision-makers because they have been overloaded with information. As a result, personal conviction on sources of information influences their adoption decision making.

> *"If I checked Google search and I can see that, okay the systems or technologies had not got a bad review." SM2*

> *"I have the confidence in the provider that provides information that is using whenever I need the information I can get it from them." SM1*

6.6.4 Time limitation

Time is another great challenge participants have because of the size of their companies, and they did not have the resources to employ a specialist to seek information for them on emerging ICTs. Secondly, because there are numerous technology providers they found that it was time-consuming to review these providers during adoption decision-making process. As a result, they relied on information from ICT experts, online reviews and their staff to make adoption decision during this process, as the data suggested.

> "Because we relied so much on them and because we do not have enough time to go to the internet to check the information." SM7

6.6.5 Perceived information reliability

Participants recognised that comprehensive information on an emerging ICT, about government regulation, costs, users' acceptance and pros and cons of smooth ICT implementation aided adoption decisions. The perceived usefulness of information has effects on adoption decision-making, either to accept or reject the emerging ICT, as suggested by data analysis.

> *"Use the Internet as your first search, then speak to people professional colleagues, expert that you think that have done it before, check the forums, and get feed- backs, tried a demo on a demo platform, then you know is secure or not." SM*

Emerging ICT adoption decisions cannot be made unprepared as shown so far by the data analysis. As a result information gathering, seeking, and requirement and categorisation become important parts of adoption decision-making process. This was noted by the participants as they talked about how information has helped them to reduce emerging ICT uncertainties and make an informed decision. They investigated and assessed all the significant factors and challenge in making the adoption decision. Investigating the various factors involved enable them to gather more useful information for implementation and decision-making.

> *"So we gathered all this information the benefits, pros and cons, gather all the data online and see how it does apply to us and as a company what can we benefit from that. We become certain as we got all the information through that process." SM6*

> *"Go back to the process which is crucial and try to reach our conclusion. There might be a conclusion made by the government and a conclusion by the clients, but our conclusion will be coming together all the information we received from everyone, and we would weigh them and determine what would think is the best interest of the company." SM8*

With the combinations of the influencing factors and adoption behaviours, participants make sense of the emerging ICT during adoption decision-making process because of the information they have on their hands.

6.6.6 Herding event

The participants often influenced by information from key business partners and technology trends. Network influence was discovered in that owners rely on comments and suggestions from other people in online communities or forums during adoption decision making. Nowadays, the Internet is filled with numerous business owners, who are looking for and ready to meet other business owners to gather and share information and experiences related to emerging information technology, according to the findings. When people are associated or linked as a business partner, a colleague or in a network together, it becomes possible for them to influence each other's behaviour and decision-making.

> *"What is happening around influence on whatever we adopt in term of technology?" SM1*

> *"It always allows you to introduce something new, something smarter, as long as your competitors are doing it, that gives you bill of space to enhance your operation, be competitive in a market scenario where its matter." SM4*

As a result, their interests and the subsequent choices they make are influenced by their professional colleagues and technology trends. This kind of behaviour during adoption decision-making activities shows a herding event in SME managers' information use and sources during this process.

6.6.7 Testimonial

Information from earlier adopters of emerging ICT is one of the influential factors that influenced participant decision-making when adopting emerging ICT. According to the participants' testimonies from previous users prevent them from making a wrong decision. These testimonials came in a form of review and endorsement of other people on the ICT it can be negative or positive. This is a great information because accord to the interviewees it improved their knowledge on any characteristics of the emerging ICT that they were unclear about.

> "Also, we always asked clients tell us or we call it testimonial from unknown other users, who are probably using it. For a year or a month probably, we always ask for feedback from them." SM16

"Likewise, other users may have I have had negative experience which quite often results in a costly bad decision. So if we can learn from other people lessons, it would save us from making a bad decision on adopting a new technology." SM12

CHAPTER 7 Discussion on Information Behaviours from the Findings

This chapter discusses the final framework of information behaviours of SME managers generated from this research with the support of similar findings and theoretical concepts from previous studies. The chapter also presents the influential factors on information behaviours during decision-making process when adopting emerging ICTs.

7.1   Discussion of findings

The information behaviour of SME managers during adoption decision-making process is complex and irregular in nature to comprehend because of complications and unpredictable changes in technology. In other to have a comprehensive understanding of information behaviour of SME managers during adoption decision-making process when adopting an emerging ICT, efforts were made to start from their information requirement and need. From the literature review and findings on information behaviour during the decision-making process, it was shown that decision-makers would encounter problems or challenges that trigger SME managers to seek for information during this process. Likewise, in technology adoption process the adopters face challenges during this process that would trigger their information behaviour and encounter information that would help in their adoption decision-making process either to adopt the technology or not.

Emerging ICT decision will be based on prediction because predicting the impact or benefits of the new emerging ICT is not accurate and is a difficult task to do. But having information or pre-discussion on the emerging ICT is crucial. Prediction is nothing but information gathering and is challenging because of various information on the Internet. From the findings, SME owners gathered information on ICT both from the internal and external environment. The use of the technology organisation environment model as the theoretical underpinning for this study lets us understand and explore information behaviour of SME managers and how they gathered information both from the internal and external environment and the factors that influence their information use.

7.2 Technology context of perceived information needs

7.2.1 Uncertainty driven

Uncertainty means that there is not enough information to perform a task or make a decision. It means lack or absence of information: as information increases, uncertainty decreases. Uncertainty triggers information behaviour and can lead to information overload. Uncertainty in this research is considered to be a problem that is directly related to information needs, challenges and gathering during emerging ICT adoption decision-making. According to Walden and Browne (2009), decisions involving technology are fraught with complexity and uncertainty and these make it difficult for decision-makers to make probability on their adoption during adoption decision-making process. And these annotations supported one of the concepts for this research, uncertainty driven. The finding suggests that uncertainty related makes SME managers seek information, both internal and external information, on the emerging ICTs, to increase their knowledge on the emerging ICT during adoption decision-making process.

For example, Bobtcheff and Villeneuve (2010) stated that generated payoff is not enough to make a decision under uncertainty investment decision. They concluded that an investor would prefer to wait and collect information for clarification rather than to invest too fast in a project that turns out to be unprofitable. For example, for Dervin (1992) sense making is a process of how people give meaning to experience in their circle. The findings suggest SME managers are not confident of their employees' behaviour, how the new technology will improve their productivity or the business value of the technology; these eventually lead to their information need or requirement during the decision-making process. In the same vein with the finding of this research on uncertainty driven during technology adoption decision-making process, Kauffman et al. (2015) discussed three significant characteristics of technology investment decisions similar to investment decisions under uncertainty. The three features are: firstly, technology investment decisions involve large-scale infrastructure development and personnel and training costs which are partially or completely irreversible. The technological and marketing uncertainties include future benefits and cost of the investment.

Lastly, decision-makers used the information to reduce their uncertainty to a satisfactory level. Furthermore, Kauffman et al. (2015) also listed some uncertainties related to IT

decision-making. such as consumer, market and regulatory responses, IT-driven changes in operational and transactional performance, technology standards and competition, and future market conditions; these corroborate with the findings of this research regarding SME information behaviour during adoption the decision-making process. SME owners gathered information in order reduces the uncertainties on their employees' acceptance and requirement. Therefore, consulting with their employees, customers or accessing their existing technology was a widespread information activity and need of SME managers during the decision-making process.

7.2.2 Compatibility

Companies' significant challenge in technology investment decision is the ability to forecast and understand the effects of future technological advancement on the value of existing technologies. Inability to address this problem can result in significant financial waste for the companies' involved (Adomavicius et al., 2008). According to Rogers (2003, p. 240), compatibility is "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters." Influence privacy the finding why SME managers carried out compatibility test and compatibility information gathering on emerging ICT during adoption decision-making process. SME managers evaluate emerging ICT compatibility with the existing ICT and use the information to build a business case for their adoption decision. Therefore, the compatibility test helps the SME owners to fill the cognitive information need during this process. This helps SME managers to avoid recruiting manpower that would handle the technology or have similar skills for implementation.

7.2.3 Legacy technology

The finding suggests that SME managers seek information on emerging ICT advantages over their existing ICT and those that appeal to their customers. The participants use information on the emerging ICT and legacy technology to make a rational decision during adoption decision-making process. Legacy technology in their company influences their adoption decision because it makes it difficult for them to meet their customers' need and improve their service to them. The processing of relevant information on the emerging ICT makes it possible for the participants to make a judgement either to adopt or reject an emerging ICT

during this process. The existing technology makes it difficult for the SME managers to meet their customers' requirement and satisfaction. Having information on an emerging ICT during adoption decision-making process enhances their adoption decision. The needs to satisfy their customers using emerging ICT triggered SMS managers' information behaviour and resulted in SME owners' active behaviour during adoption decision-making process. Participants rendered the services to their clients using the existing technology, but the legacy technology does not help them to meet their customer satisfaction, requirement, employee performance, and business growth; this becomes a challenge for SME managers as well. As a result, they seek and need information on any emerging ICTs that can assist them in actualizing their technology information need. This finding was supported by Van Riel et al. (2004) who stated that when it comes to introducing high-technology, customer information plays a larger role in the introduction of successful new services.

7.2.4   Relative advantages

In SMEs, the manager sees emerging ICT as a tool or means to satisfy their customers and improve organisation efficiency. In SMEs, it was found that customer satisfaction through emerging ICT is essential in today's technology advancement and unstable environment. Furthermore, SME manager pre-information on emerging ICT on how it can improve their profitability and increase customer satisfaction before adoption decision influences emerging ICT. Ramdani et al.(2013) finding supported this finding; according to Ramdani et al. (2013), SMEs with a greater perceived relative advantage, and a greater ability to experiment with systems before adoption, become adopters of enterprise and larger size systems because of relative advantage. And when an IS innovation is perceived to offer a relative advantage over the firm's existing practice, it is more likely to be implemented (Lee, 2004).

7.2.5   Lack of technical know-how

The information and skill needed to implement the emerging ICT appropriately were lacking in SMEs as the finding suggests. The SME manager knew there was a skills gap and were trying to close it by acquiring information during adoption decision-making process. Therefore, the overall conclusion is consistent with the challenge that technology advancement is increasing the skills and information needed to implement emerging ICT successfully in SMEs. This study collaborates previous research findings on problems and

difficulties SMEs have during the adoption of ICTs, which necessitate why they seek to support both within and outside the organisation see for example (Bruque and Moyano, 2007, Kannabiran and Dharmalingam, 2012). Having little or no knowledge about emerging ICT triggered SME managers to seek help and information before the adoption of new technology.

7.2.6 Perceived affordability

Affordability in this study refers to the costs of benefits, and training needed employee efficiency and business growth after implementing emerging ICT in their organisation. Managers acquire information on the cost of the emerging ICT by doing a cost analysis and compare it with the benefits regarding employee efficiency, business growth, customer satisfaction, and productivity; all these will determine whether to adopt or reject the emerging ICT during adoption decision-making process. Previous studies also confirm the fact that cost is also one of the factors that affect adoption decision in SMEs see (Seyal and Rahim, 2006) As a result of financial barriers SME managers search for positive benefits and IT advantages when making adoption decision (Nguyen et al., 2015).

7.2.6 Fit for purpose

The emerging technology must be able to perform what the manufacturer or supplier says it will perform. SME manager searches the Internet, seeking and acquiring information on emerging ICT that will solve the ICT problem or related problem the firm current has. Implementing fit-for-purpose emerging ICT is evidently significant to SME managers. Information from employees, testing and customers during adoption decision-making process have provided detailed information requirements for the emerging ICT needed and ensures that the emerging ICT is fit for purpose. It is not entirely advised to rely on information concerning emerging ICT from the Internet as suggested by the finding. This leads SME managers to confirm from the technology provider regarding the technology, staff and other stakeholders in the firm. This clarification from ICT providers influences their adoption decision-making process and triggers their information acquisition.

7.2.7   Perceived risk and security

How safe are the technology about the employee data, customer data, confidentiality, and overall loss of company data and privacy? These are major concerns or issues identified in this research. Because of these problems, the majority of the owners seek information either from the technology provider or the Internet during adoption decision-making process on how safe the technology is. Risk and security are one of the barriers identified (Phaphoom et al., 2015); their research result confirms criticality of the security concern during organisation decision-making. The finding emphasised that risk and security are indispensable carefully after an organisation decides to move operations outside the boundaries of the company. This has become a grave concern for some SME manager during adoption decision-making process. This finding supports Yue et al. (2008) research study on risk and security, which if a firm learns from prior observation of hackers and uses this to estimate future hackers, this will diminish the gap in decision theory and game theory approaches during IT security investment. Zissis and Lekkas (2012) also recognised the importance of risk and security and suggested that identifying unique security requirements and attempts to prevent it will eliminate these potential threats.

7.3   Organisation context of perceived information needs

7 Organisation perspectives plays a significant role during adoption decision-making process when adopting emerging ICT, especially during environmental scanning, as SME owners use information from both internal and external environments to make adoption decisions. In this research, organisation context refers to both the factors that triggered information behaviour of SME manager and influence owner adoption decisions. Decision-makers are not automatically presented with information they actively seek to make a decision (Stabell, 1978). Decision-makers must identify problems, search for solutions and develop methods to generate and evaluate alternatives (Choo, 2002). Many scholars have identified various factors in organisation context that affect technology adoption in SMEs. The discussion focuses on organisation context mentioned in this research that triggered information behaviour of SME managers during adoption decision-making process.

3.1 Users' acceptance information

There is evidence that behaviour of users' influences adoption decision-making process of owners during this process. SME managers consulted their staff for their opinion on the emerging ICT during adoption decision-making process. The IT department and other employees in SMEs play a significant role during this process because of complexity and uncertainty related to emerging ICT. Fear of losing their job and inadequate skills of the employee determine their behaviour in accepting or rejecting new ICT. SME managers take this into consideration during adoption decision-making process. As a result, any emerging ICT was communicated to their employees and the benefits of the new ICT explained to them. This gave them the opportunity to seek their employees' opinion during this phenomenon. The research finding corroborates with Nguyen et al. (2015) who argues that communication between the management of SMEs and their employees about change is essential when it comes to adopting emerging ICTs. Because failure to do so can lead to doubt in employees about the usefulness of the new technology, resulting in a negative attitude towards the change, fear about job security, and a low level of support. Informing and communicating with employees at early stage both in planning and implementation stages reduce opposition from employees towards new ICT because they feel part of stakeholders that make decisions concerning ICT and how this works for them. As a result, employees have a sense of ownership, and this generates positive feelings towards the systems (Andries and Debackere, 2006).

7.3.2 Efficiency-driven

The desire and the primary concern of SME managers on how emerging ICT will assist in achieving their business strategy improve employee efficiency and automate their operations during adoption decision-making process. These factors motivate SME owners to seek information. The owners seek information on emerging ICT that can assist them in achieving these or support during adoption decision-making process. The sensitivity of SME managers regarding the use of emerging ICT has an impact on their behaviour during adoption decision-making process. The owner evaluates the emerging ICT opportunities and investigates any emerging ICT that will increase the efficiency of their employee before implementation. The company efficiency using emerging ICT becomes paramount; therefore, information acquisition during this process becomes significant and will support managers in

adoption decision-making. This finding proposes that SME manager's efficiency is driven towards the use of emerging ICT and shows active behaviour during adoption decision-making process. In support of this finding, the previous study suggests that differences among ICT applications should be considered when introduced in SMEs. Moreover, innovation reduces cost and operates primarily as efficiency-enhancing technology (Higón, 2012).

7.3.3 Industry innovation growth

The SME managers need to focus on technology growth in the industry they belong to. The advancement in technology has brought growth to many industries and increased customer satisfaction and demand. For SME owners to remain in business and have competitive advantages there is a need for them to implement an emerging ICT that will support them in the industry and many of them acknowledged this. Hence, gathering information on emerging ICT that fit in. This was supported by previous research on how the industry to which a business belongs plays a major role in business information processing requirements of a firm which encourages the firm's adoption decision on new technology (Goode and Stevens, 2000). Previous studies also concluded that services industries are more dependent on information and sharing information when adopting information systems; this has a significant influence in their information systems decision(Goode and Stevens, 2000, Premkumar and King, 1994).

7.3.4 Owner support

In this study, owner support refers to information activities of SME managers during adoption decision-making process. According to the finding, when managers in SMEs recognised the significance of emerging ICT in their company, they play an essential role in inspiring their employees to participate in conferences and events on technology and gather valuable information on emerging ICT, which will support their operation. It will improve their adoption decision-making process and encourage technology adoption. In SMEs, the decision-makers are usually the top management team and their support is crucial for the introduction of new technology to take place (Ramdani et al., 2009). Hence, technological adoption is supported using a top-down approach specifically because it is a must for the top management to comprehend the role of technology in improving organisational performance,

overcoming a perceived performance gap, and exploiting a business opportunity (Gangwar et al., 2015). Previous research indicates that management support mostly motivates and supports successful initiation, adoption and implementation of emerging ICT in SMEs; see (Lian et al., 2014).

7.4   Environment context of perceived information needs

The changing external environment of the SMEs contributes to technology uncertainty and challenge during adoption decision-making process, which can lead information behaviour of SME managers when adopting emerging ICT. The literature review has shown some of these challenges or pressures appear commonly either when taking or during decision-making process in SMEs. This signifies that they are important factors during adoption decision-making process when adopting emerging ICT in SMEs. Therefore, information or pre-knowledge about emerging ICTs before the adoption is crucial to the success of any emerging ICT in SMEs. According to Kydd (1989), many ICTs have failed implementation because of lack of information before adopting them. From the findings, it was discovered that SME managers scan the environment. It has shown from previous studies' findings that external pressures should be studied, scanned and understood when making adoption decision in SMEs. The various information needs and requirement of SME managers that arose from external pressures are discussed in this section.

7.4.1   Competitor's intelligence gathering

Concerning the competitor intelligence gathering, concentration scanning was done by the SME managers on emerging ICTs that can give them competitive advantages over their competitors in the same industry. This will trigger their information behaviour seeking information on emerging ICT. Therefore, attaining competitive advantage is still one of the most important drivers of adoption, and managers should be aware of the significance of this factor during adoption process (Oliveira et al., 2014). According to Raymond and Ramangalahy (2001), SMEs must continually innovate to differentiate themselves from their competitors, which require better control of information in the form of environmental scanning systems. Alshamaila et al., (2013) and Lim (2014) also recognised the significance of competitor information and competitive environment pressure during adoption process in SMEs and how it has a direct influence on decisions. As competitors play an importance role

in the business environment, SME managers gathered information on what kind of technology or innovation the competitors are using.

7.4.2 Customer's information gathering

The data confirm that customer requirement information on emerging ICT is crucial because according to the participants they gathered information on their customer wants and demanded and sought emerging ICT that would help them deliver it. This finding corroborates Zhu et al. (2003) that one significant factor for decision-makers that determines how an organisation will make a profit from adopting e-business is consumer willingness to use the systems. This readiness can come in the form of customer requirement on the new technology. Previous research also pointed out that customer pressures from the environmental context can also be a primary driver for adoption in SMEs, which SME managers always consider before making adoption decision and influences their adoption (Beckinsale et al., 2006, Ghobakhloo et al., 2011, Mehrtens et al., 2001).

7.4.3 Provider credibility

The credibility of the provider of emerging ICT is important when it comes to adoption decision-making process. From the context of this research, SME managers need information on how trustworthy the supplier is concerning helping them when they have challenges, supporting them in training their employee on how to use the technology, and their customers' relationship. The information they get will inform their decision either to accept or reject the new technology. Secondly, the more information SME managers have on emerging ICT through the provider website the more confidence they have during adoption decision-making process, according to the participants. Similarly, Kurnia et al. (2015) pointed out that environment pressures such as supplier pressures have significance in an adoption of technology in SMEs. In a similar research by Harindranath et al. (2008) the result found was that SME managers recognised ICT to be often costly and complex and are cautious of consultants and vendor organisations. Also, Chibelushi and Costello (2009) established that the problems facing small business managers are a result of many unreliable, affordable and non-skilled sets of consultants that offer advice. External consultants are knowledgeable but expensive while public advisors are affordable but may lack sufficient knowledge (Chibelushi and Costello 2009). These challenges from both the supplier and

external ICT experts' behaviour triggered SME managers to seek information on any emerging ICT provider credibility before sign a contact with them during adoption decision-making process.

7.4.4 Technology market growth

The SME managers need to focus on technology growth in the industry they belong to. The advancement in technology has brought growth to many industries and increased customer satisfaction and demand. For SME owners to remain in business and have competitive advantages there is a need for them to implement an emerging ICT that will support them in the industry and many of them acknowledged this. Hence, gathering information on emerging ICT that fit in. This is supported by previous research on how the industry to which a business belongs plays a significant role in business information processing requirements of a firm which encourages the company's adoption decision on new technology (Goode and Stevens, 2000). Previous studies also concluded that services industries are more dependent on information and sharing information when adopting information systems; this has a significant influence on their information systems decision (Goode and Stevens, 2000, Premkumar and King, 1994).

7.4.5 Government policy

Government policy pressure triggered information need during adoption decision-making process. SME managers seek information on government policy that might affect the adoption of the emerging ICT. This includes information on privacy, training, Data Protection Act and different government policies that might affect the implementation of the emerging ICT, according to the participants. Sometimes government provides assistance to SMEs to inform them of establishing agencies that would support SME managers by organising events and conferences on emerging ICT; this type of event and conference enlightens them on the new technology. This supports the finding (Kuan and Chau, 2001, Lian et al., 2014) that government support and policy on privacy influence adoption decision-making process in SME's and trigger information seeking in SMEs during adoption decision –making process. This problem makes the promotion of government policy and private industry necessary in SMEs. This research also corroborates Zhang et al. (2008) research

finding that entrepreneurs should be aware of opportunities as a result of technology entrepreneurship policy.

7.5   Sources of information

According to the findings, SME managers use different information sources to acquire information about emerging ICTs, scan the environment and gather information on the emerging ICT before making decisions. Mostly, SME managers used ICT professional event, expert opinion as sources of information, online professional community, viva voce. According to Auster and Choo (1994), information obtained from various sources of information is utilised to make day-to-day decisions and prepare for a longer-term strategy. A considerable amount of literature has been published on the classification of sources of information as personal internal, internal impersonal, external personal and external detached. Information originating from outside the organisation is called the external source of information while that from inside the organisation is called internal source. It categorised into personal, for example, colleagues, supervisors, and internal and external experts; and secondly, impersonal, for instance, documents, manuals, technical specifications, journals, libraries, and electronic repositories (Auster and Choo, 1994, Byström and Järvelin, 1995, Kuhlthau, 1999). Furthermore, a particular source can provide multiple information or vice versa, and one source of information can be better in providing one kind of information and not another (Yunjie et al., 2006). According to data collected and analysed in this research, SME managers used various sources of information, both internal and external during adoption decision-making process when adopting emerging ICT. This is similar to research on business managers' use of information sources by Rulke et al. (2000), which showed that managers' exposure to internal sources of information, both relational and non-relational, as well as to external relational sources of information, is positively related to self-knowledge.

7.5.1   External personal source

According to the participants, external personal sources of information such as expert opinion and word of mouth were used when searching and when scanning the environment during emerging ICT decision-making process. This supports the research findings by Choo (1983) that personal sources are rich information sources because they convey their information using rich media. For instance, face-to-face meetings and telephone conversations, permit

chief executives to observe additional information, seek clarification immediately, and investigate more deeply, and overall, to make better sense of an unclear situation.

Word of mouth, as a source of information, gives them the opportunity to acquire more information from technology providers whenever they come to advertise their product to the SME owners. Secondly, it has been used as a source of requirement and information gathering from their customers on their satisfaction. The research finding suggests that SME managers asked questions on the benefits of the technology, cost, security, and technical aspect from these providers. Providers went to various offices or conferences telling them about the emerging ICT, how to implement it, impact of technology on their operation, and how it will meet their customer requirement. SME managers knew about government policy concerning the emerging ICT through word of mouth; it can be by telephone or face to face. The government announces its plan using both online and their agencies to both the consumers and business owners these serve as another primary source of information for SME managers according to the participants. Research findings have categorised information sources as external sources when the information comes from an external person such as external experts, human externals, and relational sources external and decision-makers and information seekers used these sources to gather information when the need arose (Auster and Choo, 1993, Zimmer et al., 2007).

7.5.2   Internal personal source

SME managers use their employees as a source of information during this process because they are the ones that use the technology. Information from the employee helps them to evaluate the emerging ICT before adopting it. As a result, this reduces the uncertainty associated with emerging ICT about their employee. Secondly, their employees sometimes work directly with their customers from there they gather customers' requirement on emerging ICTs, and how they can use emerging ICT to meet their customer's need; for that reason, the employee becomes a source of information during this process. Information from employees, junior colleagues, supervisors and managers in an organisation during information seeking behaviour and information activity has been categorised as relational interpersonal, internal personal and internal source of information by different scholars. Also, researchers have called it top-down communication or up-down communication (Cho, 2014, O'Reilly, 1982, Zimmer et al., 2007). Furthermore, this supports the research finding by Yoo

and Sawyerr (2014) that information from internal sources of information such as employees has a significant positive impact on SMEs. In supporting the evidence from the finding, according to Saunders and Jones (1990), information comes from humans or organisations and can be classified as external and internal sources. Internal can be from a level above or below the decision-makers and executives' information comes mostly from outside the organisation, but they take information from managers at a level below them more seriously and value it at the same time. This collaborated with the findings as participants acquire information from their employees during this phenomenon.

7.5.3   External impersonal source

The information SME managers got from the conferences they attended or sent their employees to on their behalf helps them with some technological challenges associated with the emerging ICT. The conferences are an avenue for them to ask questions about what types of support they will get concerning technology support, and clarify their uncertainties. The information on emerging ICT gathered from attending an event, seminar, or conference on new technology is used to clear some of the uncertainty associated with the new technology. Nkongolo-Bakenda (2003), researching globally oriented small and medium-sized enterprise managers (GOSMEs) in Canada to understand the information sources of the executives, suggested and concluded that most information sources mostly used by SME managers are customer contacts, trade associations, reviews and other specialised publications, trade shows, and purchase technology. Trade shows (43%) is the most used source when scanning for information on technology and reviews and other specialised publications (25%) follow this.

7.5.4   Online professional community

Social media is another avenue for SME managers to gather information during this process. According to the participants, most of them searched websites of various technology providers, or forums were discussion is going on, and something has been discussed in the past concerning the emerging ICTs. During the information seeking activities most of these sources provided information they needed and this information effactually guided their adoption decision. This gave them the opportunity to investigate more about the technology they intended to adopt. Online communities are important sources of information from those

people that had adopted the technologies before because they provided information and shared their experience regarding technological experience, cost-effectiveness, customer relationship of the technology providers and more. The types of information and information acquired in these sources, as suggested in this research, demonstrates that information from members of online communities is significant during adoption decision-making process in SMEs when adopting emerging ICT as this source provides information needed. SME managers gather information from online communities on the types of technology their competitors are using to satisfy their customers, feedback from previous adopters, and non-adopters through online review, online business partners, and general online communities on technology. Another classification by Nkongolo-Bakenda (2003) is online information electronic/online sources such as web search engines, online knowledge bases, professional websites, and getting information or answers from pre-posted entries in forums and blogs.

7.6   Influential factors on information sources and use

One of the functions and duties of SME managers is decision-making and to make a rational decision, a decision-maker will need to seek for information either through external or internal sources. The objective is to maximise the usefulness and contribution of the organisation resources and information capabilities in an attempt to reduce complexities and uncertainty during decision-making process when adopting an emerging technology. In the process of acquiring information, gathering, and using information, managers scan the environment and seek information from a variety of sources. During this activity of acquiring information to make technology adoption decision, SME managers gathered much information and had many sources to search. Hence, this leads to information overload and accessibility to more information increases the chance of having more information to consider in order make a right selection. This is more than overcoming some certain principles, following rules or mastering some techniques before getting desired results or information, but this information behaviour has an affective component that influences the process, sources and information use (Flavián-Blanco et al., 2011). The factors that influence information process, behaviour, and sources, are numerous, such as task complexity, cognitive, situation, personality traits, accessibility, emotional factors, and experience according to the literature review (see for examples de Alwis et al., 2006, Lu and Yuan, 2011, Morrison, 2002, O'Reilly, 1982, van den Boer et al., 2015, Zimmer et al., 2007). These research findings are consistent with this present study's results discussed in this section.

7.6.1   Information usefulness

This is in line with the findings of this study that SME managers continue to use specific sources of information for scanning because they provide useful information, provide reliable information, and quicker information for owners' during this process. Information usefulness means that an information source has the capability to provide appropriate information at the time of want, both technical and non-technical information; to make available the necessary information regularly and reduce uncertainty during this process. Furthermore, the reasons for using information from a particular source of information by decision-makers had been investigated by different researchers. The prior research findings established that quality of sources, accuracy, accessibility, specificity, and information richness were factors that influence decision- makers to continue or use the information from the information sources or channel (Guo, 2011). This supports this research finding that SME managers used information from sources that provides reliable and useful information during adoption decision-making process. Therefore, the usefulness of information source is the ability to reduce uncertainty and equivocality during this process, according to participants in this phenomenon. Although quality should be related to information source use, it is not compulsory that during information seeking behaviour all users will agree to the quality of a particular source (O'Reilly, 1982).

7.6.2   Openness to other people's experiences

Borgatti and Cross (2003) reviewed many literature on social networks, information processing, and organisational learning along also with the results of a previous qualitative study, proposed a formal model of information seeking behaviour and concluded that seeking information from another person is a function of different factors. They listed the reasons as follows, knowing what that person knows; valuing what that person knows; being able to gain timely access to that person's thinking, and lastly perceiving that seeking information from that person would not be too costly. This corroborates the findings from this research results that, SME managers seek information from those that have adopted the technology early before them and sometimes from IT experts that will direct them through the implantation process and any other technical knowhow during adoption the decision-making process.

7.6.3 Perceived information sources credibility

The credibility of the information source influences SME managers' decision during the decision-making process. The owners have confidence in the information from the ICT experts, exhibitions and technology providers as trustworthy and these information sources provide factual information for them during information seeking behaviour. Source credibility is the extent to which an information source, in general, is predictable as a source of consistent information, the possibility of information from these sources to be authentic about the emerging ICT because of many sources talking about the same thing at the same time. The credibility of sources of information influences the opinion on emerging ICT in SMEs, according to the participants, as well as the possibility of making an adoption decision.

7.6.4 Time limitation

The findings suggest that a significant quantity of effort is made to seek information that might be appropriate in establishing the emerging ICT implementation, reduce uncertainty, use and any other factors that are related to technology, organisation and environmental context during adoption decision-making process. To seek for this information, SME managers consulted many sources of information as discussed above, but there are numerous sources of information that provide information on emerging ICTs. This becomes a challenge for SME managers to select information sources and use information from a particular source, but from this research's findings, one of the factors that influence information source selection and information use during this process is time constraints, among other factors identified. SME managers are in charge of running day-to-day activities of the company. This becomes an issue for them when seeking information because it involves time before searching through some of the information sources; as a result, some of the participants preferred to use their contacts, ICT experts, sent their subordinate to conferences or used internal sources of information.

Time constraint influences participants' selection of information sources in the process of acquiring information for a decision. In a recent research by Savolainen (2015) on features of cognitive barriers and their impact on information seeking, the research result shows that both positive and adverse cognitive barriers have impacts on information sources selection. The

impacts of cognitive barriers are mainly negative because they block, limit or hamper information seeking, or give rise to negative reactions such as frustration. Cognitive barriers can also impact positively by helping the individual to concentrate on a few, good enough sources of information. And accessibility has been described by many scholars to involve cost and time-saving when choosing information source. In similar research by Fidel and Green (2004) on factors that influence source selection, the authors stated that the information seeker would always select sources that they were familiar with but saving time is the most common factor that most participants mention as a reason for choosing a source. This result does not differ from other research findings on information source selection (such as Woudstra and van den Hooff, 2008, Xu et al., 2006).

7.6.5   Perceived information reliability

Reliability is the ability of the source to provide information that helps the decision-maker. The expert that provides the information or the sources such as the Internet must be able to provide the information next time; the information on the emerging ICT is authentic and has provided valid information in the past. The participants' prior experiences of an information source in providing technical advice, quicker response to their request and help in reducing uncertainties relating to technology context, environment and organisation context. This factor has a significant influence on information activities during adoption decision-making process. In line with this research's result, Gerstberger and Allen (1968) point out that information channels that people assume to make available information of higher quality or reliability will be used first in the course of an active information search, especially those that provide technical quality. A similar finding that corroborated this research finding is Marton and Choo (2002) that there is a strong relationship in source quality and usage when selecting information sources. Woudstra et al. (2012) concluded that quality and accessibility are two factors that influence human information sources, but quality has a stronger influence; this supports the research findings here that source of information reliability is one of the factors that affect SME managers during adoption decision-making process when actively seeking information during this process. Reliability was used in this research to represent the quality of information sources (see also Xu et al., 2006).

7.6.6   Herding event

The participants are often influenced by information from key people in their lives. According to the participants, they relied on the comments and suggestions of other people in online communities, and conferences and exhibitions during information seeking and adoption decision-making process. As a result, their interests and the subsequent choices are frequently influenced by groups such as trade associations, online communities, and professional colleagues. SME managers used information from their business partners and colleagues in the same industry. The information from others is significant when acting in the same way. Same benefits or with various information to select from different sources of information on emerging ICT during adoption decision-making process. This becomes an issue; therefore, SME managers will follow decisions of others and use information sources that are popular during this process. Duan et al. (2009) pointed out that, herding phenomena have an impact on adoption decision in two ways when gathering information from the Internet. The Internet provides information about other users' choices, therefore, making herding more feasible. Secondly, there is a lot of information on the Internet about a product. Duan et al. (2009) research results validate the significance of information cascade as a driver for decision-making on the Internet. (For more examples of influence of herding behaviour or event on information behaviour during adoption decision-making process (see Hirshleifer and Hong Teoh, 2003, Li et al., 2014, Luo and Lin, 2013, Walden and Browne, 2009, Woudstra et al., 2012).

The research results corroborate with findings here on influential factors on information behaviour of SME managers during adopting decision-making process. The most popular decision in the information systems field is technology adoption. ICT adoption does not happen by chance; the information an adopter knows about the adoption is consolidated and expressed in adopter behaviour; research shows that information cascade and herd behaviour occur when a decision-maker has little information about new technologies and has to follow other people's action without regard to their own actions (Walden and Browne, 2009).

According to Duan et al. (2009), online software adoption decision was consistent with the theory of information cascade. Au and Kauffman (2003) used the rational expectations hypothesis (REH) and adaptive learning as explanatory theories; they argued that the REH

hypothesis can be used to form an expectation on the part of decision-makers as expectation is past information available to economic agents or firms and informs their forecasts of future occurrences. Adaptive learning is an opposite of expectations because of the assumption that agents recognise the structural model of the economy or marketplace; nevertheless, economic agents provide some flexibility by allowing learning to take place. In similar research, Walden and Browne (2009) extended existing observational learning models and used simulation to test the model. The results suggest that following the behaviour of other similarly positioned decision-makers is a very useful approach when there is an enormous amount of uncertainty, and observational learning is most likely frequent in adoption decisions. In a recent research, Duan et al. (2009) empirically examined the impact of information cascade on product adoption on the Internet; the findings validated information cascade as an important driver for adoption decision and information source and information use.

7.6.7 Testimonial

The personal recommendation of information sources by previous users has an influence on selection and use of information from that source. The information posted on the Internet, online forums and during conferences on emerging ICT, SME managers tend to use this information and seek information from these sources because of the belief that people who posted information on these sources have first-hand experience on the emerging ICT they are gathering information about. As a result of testimonial from a particular source which helps during information seeking behaviour and adoption decision-making process, considering some of the factors discussed earlier about influential factors, SME managers continue to visit that source when seeking information again.

7.7 Summary

In summary, the findings from the research have indicated general information behaviours of SME managers. Key activities on information behaviours were also identified. The results of the study are highlighted below:

- ❖ The sources of information have a significant impact on SME managers during their adoption decision-making process. Both internal and external sources provide information for SME managers during this activity.

- ❖ To ensure successful ICT adoption decision, SME managers not only need to have a sound knowledge of the essential functions and features of the emerging ICTs to be adopted. Also need to seek, gather, and critically evaluate the information from all sources before actually making the decision (e.g. the cost of the technology, the perceived benefits and drawbacks of the technology, customer requirements, the cost implementation and maintenance.

- ❖ Herding events have an impact on the adoption decision of SME managers when seeking for information, and using sources of information.

- ❖ The information needs or requirements of technology trigger information behaviour of SME managers.

- ❖ SME managers also conduct a feasibility scan on the emerging ICTs during the adoption decision process to reduce the uncertainty associated with the technology and gather information on the market situation, competitors.

- ❖ The evaluation and assessment of the emerging ICTs aid their adoption decision and help in the implementation of the technology.

7.8   Conceptual framework

Figure 7.1 describes the findings in this study. The framework originated from the data analysis and the data analysis based on the research framework is presented in Section 3.7. The thematic analysis based on Braun and Clarke (2006)'s principles on thematic approach (section 5.2), the review of the literature on information behaviours in Sections 2.3 to 2.7, and Myers and Newman's (2007) interview guidelines have all helped in the process. All these contributed to diagrammatise information behaviours of SME managers during the adoption decision-making process of emerging ICTs, and factors that influence their information behaviours as show in Figure 7.1. The conceptual framework shows the information needs from the internal and external environment, technology uncertainty and desire for innovation by the management of SMEs to acquire information on emerging ICTs. These three contexts helped SME managers to evaluate the emerging ICTs and in the process of evaluation, they seek for information using different sources of information. As a result, this leaves them overloaded with information from various sources, which leads to analyse the factors that influenced them to use the information and select sources of information, as shown in Figure 7.1. The results of this research have contributed to the validation and extension of the TOE

framework, helped to understand SMEs' information behaviours, and explored the triggers of information behaviours and information needs during adoption decision-making process.
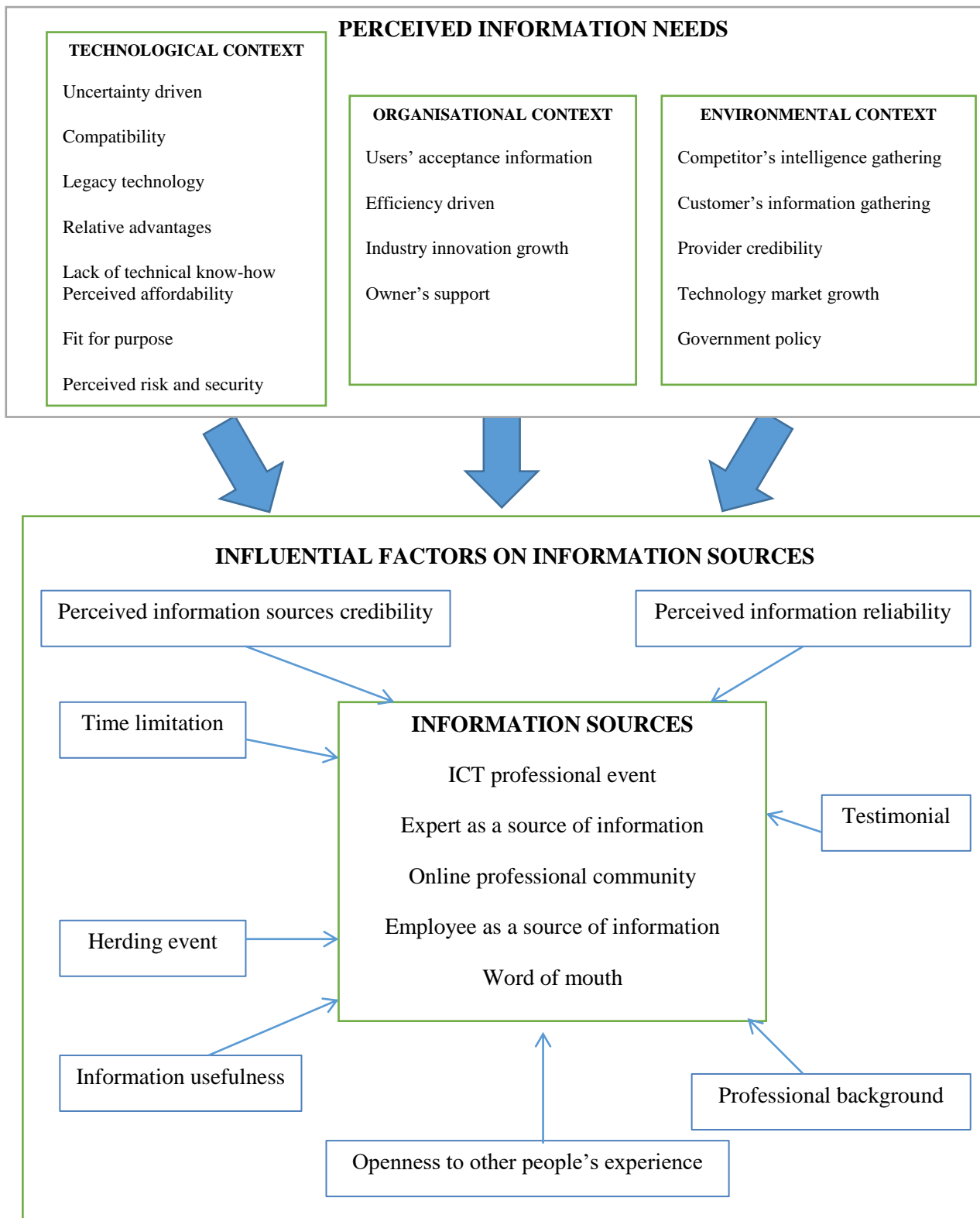
PERCEIVED INFORMATION NEEDS

TECHNOLOGICAL CONTEXT

Uncertainty driven

Compatibility

Legacy technology

Relative advantages

Lack of technical know-how
Perceived affordability

Fit for purpose

Perceived risk and security

ORGANISATIONAL CONTEXT

Users' acceptance information

Efficiency driven

Industry innovation growth

Owner's support

ENVIRONMENTAL CONTEXT

Competitor's intelligence gathering

Customer's information gathering

Provider credibility

Technology market growth

Government policy

INFLUENTIAL FACTORS ON INFORMATION SOURCES

Perceived information sources credibility

Perceived information reliability

Time limitation

INFORMATION SOURCES

ICT professional event

Expert as a source of information

Online professional community

Employee as a source of information

Word of mouth

Testimonial

Herding event

Information usefulness

Professional background

Openness to other people's experience

Figure 7.1 Conceptual frameworks for information behaviour during ICT adoption decision-making process

CHAPTER 8 Conclusions, Contributions, Limitations and Further Research

8.1   Introduction

The overall aim of this research is to propose a conceptual framework by exploring information behaviours of SME managers when making decisions on emerging ICT's adoption. The objectives of the study are to understand the information behaviours of SMEs in the context of technology, organisation and environment in the UK. This final chapter discusses how the research aim and objectives achieved, the methodological and theoretical contributions of the study, research limitations, and recommendations for further research.

8.2   Achieving the objectives of this research

In chapter 1 this study highlighted the objectives to be met, which have been achieved. This section discusses how these objectives have been met as follows:

Objective 1: To investigate and identify the currently perceived information needs that trigger information behaviours of SME managers relating to emerging ICTs during adoption decision-making process.

The extensive literature review made it clear that SMEs faced different challenges and barriers that triggered their information behaviours. This has been further explored, analysed, and interpreted through using the technology organisation Environment (TOE) framework as the base, which integrated these three components together. As a result of their information needs and seeking, both internal and external sources of information were identified, and uncertainty was identified as one of the reasons for information needs and seeking in SMEs during adoption decision-making process when adopting emerging ICTs. With twenty interviews conducted this study provided awareness into different contexts in which information was required during adoption decision in SMEs. Different information sources used by SME managers when seeking for information and scan environment were also identified.

Objectives 2: To explore and determine the sources of information on emerging ICTs in SMEs.

Objective 3 To explore the essential, influential factors on sources of information selection when adopting an emerging ICT in SMEs

Because of numerous sources of information, it becomes cumbersome for SME managers to select a source of information and use the information without wasting valuable time in doing that. Sometimes it can lead to information overload on the information user. This study identified factors that influenced SME managers' information source selection and information use. These factors helped to explain why SME managers considered information from a particular source as good, and this helped SME managers to make an accurate decision or reduce uncertainty related to emerging ICTs.

Objective 4: To propose a conceptual information behaviour framework for SMEs that would diagrammatise the research findings and show relationships between the themes from the data.

Also, both deductive and inductive approaches were followed during data collection, analysis and interpretation, all these lead to the proposed conceptual framework that diagrammatises the information behaviours of SME managers during adoption decision-making process. See Figure 7.1 for a conceptual framework on information behaviour during ICT adoption decision-making process.

In summary, the objectives of the study were accomplished by bringing together all the discussion from Chapters 1 to 7 in this study.

8.3   Research contributions

This section discusses the research contributions on information behaviours of SME owner/managers when adopting emerging ICTs. This study makes a significant contribution to theory and as well as practice. This research contributes to the improvement of knowledge and practical at different stages.

Theoretically, the study has taken academic research forward in the research area of information behaviour and ICTs adoption in SME in service industry using TOE model as theoretical underpinning. The practical contribution of the research result could be used by SMEs in the service industry in the UK, and any SMEs which are based in a similar environment, to have better information about emerging ICTs during adoption decision-making process. The study also highlighted sources of information and factors that influence

these sources selection which could help SME managers to choose among numerous information sources.

8.3.1 Theoretical contribution

Previous research into emerging ICT's adoption in SMEs has focused on the adoption, drivers of adoption and implementation of emerging ICTs, their usefulness and factors that influenced the adoption. There was limited (if any) research on information behaviours in SMEs during technology adoption decision-making process in the context of information technology needs, organisational information needs, environmental information needs and how SME managers reduced technology uncertainty related to emerging ICTs. This research contributes to theory by conducting research that focused on information behaviours of decision-makers, that is SME managers/owners, not on any special technology or technical aspect of technology. The conceptual framework (Figure7.1) developed in this study extends the TOE model and provided insights into information behaviours in SMEs; this consists of information seeking, need, use and scanning behaviour activities of SME managers. The empirical data were interpreted and analysed through the TOE framework resulting in the identification of information behaviour needs in the context of technology, organisation and environment which were integrated into the conceptual framework for the greater understanding of the phenomenon both from the information systems field and the information science field. According to Galliers (1990), the study of information systems is a multifaceted area, multidisciplinary and very much a social, rather than an exclusively technical focus.

These themes s like a new context in the TOE model would complement the capability of the TOE model to forecast the information behaviour in SME when adopting emerging ICTs.

This research also contributes to research in SMEs from their perceived information needs and sources of information. They are often compulsory to make decisions with insufficient relevant information, or where available, inadequate time to filter or waste considerate time searching for information which was an estimate to be £3.5 billion in interpreting or gathering information. This study has provided sources of information importantly the essential, influential factors that influence information source selection in case of information overloaded or overflow as shown in figure 7.

8.3.2   Practical contribution

A practical contribution of this research is the rich insight it provides in the context of perceived information needs I based on technology, organisation and environment, helping the technology providers with both the types of information they could sources of information they can use to provide this information. For SMEs, it creates awareness of different types of information source where they can get trusted information on emerging technologies related to the three contexts in the TOE framework. Factors that influence information sources were identified which will reduce the number of time SMEs and cost spent on seeking information, scanning the environment and filtering the information. It shows the importance of networking and getting information from early adopters' testimonial as a source of information. All these will reduce technology uncertainty and equivocality as these two influential information behaviours. These findings should help in successful implementation of technology in SMEs and during adoption decision-making process when adopting emerging ICTs. The study would also help government; to plan and propose a better policy to support emerging ICTs in SME's and information source where they post this policy for SME owners' use.

8.3   Research limitations

The limitations of this research are discussed in this section. The research method had limitations for this research due to its limitations, but some steps were taken to reduce such limitations. Many scholars have argued that qualitative research cannot be generalised due to the reason of generalisation research rigour was used. However, triangulation methods were followed to achieve the research rigour. For example, the selection of participants from different locations, the selection of qualitative method with justification, and the use of various principles on interviews and data analysis by Myers and Newman's (2007). It must be acknowledged that not all the research participants were SME managers/owners, as two owners delegated to their personal assistant to represent them because these personal assistants were involved in decision-making when it comes to ICTs. Therefore this does not affect the research findings. However, purposeful sampling strategy makes sure that the set of participants matches the purposes of the study, which is to have a deeper understanding and to explore original or discovered themes regarding information behaviours of SME managers/owners when adopting emerging ICTs.

8.4   Further research

The Firstly, future research should investigate in more details on information behaviour of SME managers in specific technologies, such as cloud computing, big data, instead of general emerging ICTs. Secondly, future research could also be done in this area by exploring information behaviours of SME managers in emerging ICTs in different sectors and industries and different countries using both mixed methods and quantitative method.

8.5   Conclusions

This final chapter established the thesis novelty by highlighting its central results and findings and the accomplishment of its aim and objectives. The chapter also proposed this research's contribution to knowledge and implications for academic research plus practice. Precisely, this thesis generated several recommendations for the industry, which SME managers can find valuable when seeking and acquiring information during technology adoption decision. Additionally, by pointing to certain limitations of the study, this chapter provided potentials of future research in some areas related to this study.

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Appendices

Appendix 1 Research invitation letter

University of Bedfordshire
Business Management Research Institute
Luton Campus- Vicarage Street
LU1 3JU

Research Interview

Dear Sir/Ma,

I am currently undertaking a research project at the University of Bedfordshire.

The objective of this research is to help SMEs to have better understand on how to search for, and use, information when adopting emerging ICTs in order to remain competitive in the market.

As data collection is a key part of the process for this research, I am inviting selected SME managers to participate in an interview. This will take about 30 minutes, and will focus on the decision-making process of SME managers when adopting emerging ICTs.

It would be very much appreciated if you would be willing to be interviewed on this topic, at a time and place convenient to you. The interview can be in person, by Skype or by phone. If you are happy to be interviewed, please let me know, and say which method you would prefer.

Attached are the questions that will be used to guide the interview process to give an understanding of the topics that will be covered, and with your permission the interview will be recorded.

The research is bound by the Market Research Society's code of conduct and University of Bedfordshire research code of conduct, and all responses will be strictly confidential, with only fully anonymised results would be published. In return for your participation, I will be very happy to send you a summary of the findings at the conclusion of the research.

I sincerely hope that you will agree to participate in this research. If you have queries concerning the nature of the research, or are unclear about the extent of the involvement required, please feel free to contact me by email: sulaimon.olatunji01@beds.ac.uk, or any of the supervising team: Dr Yongmei Bentley: yongmei.bently@beds.ac.uk Professor Yanqing Duan: yanqing.duan@beds.ac.uk,Dr Vincent Ong: Vincent.Ong@regents.ac.uk
Thank you for taking the time to consider your participation in the research, and I look forward to your reply

Yours sincerely,

Sulaimon Olatunji

Mobile telephone: 07429152683 Skype ID: solomon7613

Appendix 2 Research consent form

Research topic:

The Development of a Framework on Information Behaviour of

SME Managers when adopting Emerging ICTs

❖ I understand that my participation in this project will involve the digital audio recording of my voice.

❖ I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason.

❖ I understand that I am free to ask any questions at any time. If for any reason I experience discomfort during participation in this project, I am free to withdraw or discuss my concerns with Sulaimon Olatunji and supervising team (Dr Yongmei, Professor Yanqing Duan and Dr Vincent Ong).

❖ I understand that the information provided by me will be anonymous and stored securely, such that only the researcher and supervising team can trace this information back to me individually. I understand that I can ask for the information I provide to be deleted/destroyed at any time and, in accordance with the Data Protection Act, I can have access to the information at any time.

❖ I understand that information provided by me for this study, including my own words, may be used in the research report, publications, or presentations, but that all such information and/or quotes will be anonymized.

❖ I also understand that at the end of the study I will be provided with additional information and feedback.

I,   consent to participate in the study conducted by Sulaimon Olatunji, a research student at University of Bedfordshire, BMR1 as part of his research study "The Development of a Framework on Information Behaviors of SME Managers when adopting Emerging ICTs".

Researcher:
Supervision Team: Dr Yongmei Bentley, Professor Yanqing Duan, Dr Vincent Ong

Signed:

Appendix 3 Research interview questions

Unit of analysis	Guiding Questions
The participants	1. Can you tell me about yourself in relation to this company and the background of the company? 2. When was the last time when you adopted an emerging ICT such as cloud computing?
Technology Uncertainty	3. Adoption decision technology uncertainty exists when it is obvious that all requirements cannot be understood or you are using emerging ICTs for the first time, particularly cloud computing, at the level of performance and expectations required in a company. What are the technology uncertainties during your company adoption decision making process that triggered your information behaviour?
	4. Were fit for purpose, security risks, staff acceptance and expert issues among the technology adoption uncertainties?
Prompt Questions	5. If yes, why?
Organisation	6. What role your employee play during the adoption decision-making process on emerging ICT and when gathering information in your company?
	7. What was the process of communicating emerging ICT in your company?
Follow-up-question	How effective was it?
Environmental	8. Why did you gather or scan the environment for more information on emerging ICTs (for example, supplier information, customer requirements, market opportunities, government policy and trends)?
	9. Do you think information on government policy or regulation on (competitors, industry, market scope, Supplier, staff and both internal and external support) were determining factor during adoption decision making process?
Prompts	10. How? 11. Why?
	12. When technology adoption decision makers are lacking information that they feel is necessary to make the best technology adoption decision, they take one or two paths in seeking for information. How do you seek, gather or scan the environment for information during adoption decision making process?
	13. How do you deal with multiple sources that provide information on the same topic (Filter information)?

	14. What were the main sources of information on emerging ICTs in your company?
Prompts/Follow-up questions	How do you select the information to be used on? Were these information needs satisfied during the adoption decision-making process? How? Do you use any social medial as a source of information on? Adoption technology uncertainty Organisation context Environmental Why?
Influencing factors on the use of information during adoption decision-making process	15. What factors influence your information sources selection and information use on emerging ICTs? How?
Herding	16. Have any of your professional colleagues using information sources on an emerging ICT and you too have considered using it?
Prompts	17. Why did you do that?
	18. Did your previous adoption decision play an important role during this process?
	19. If yes, how and why?

Note

1. Information behaviour is the process of searching for information; gathering, seeking, acquisition, needs, scanning and use of information.
2. A government policy or regulation on emerging ICTs is plans, initiative, strategy and practice considered useful, prudent, or advantageous during adoption decision making process.

Appendix 4 Raw data interviews

This table shows the data generated from interviews using the research question to develop the interview question technology, organisation environment perceived information needs.

Research question 1: What are the challenges or concerns faced by SME managers during adoption decision-making process when adopting emerging ICT that triggered their information behaviour (such as, information needs, wants)?

Appendix 4a: **Themes and data extract on technology as one of information requirements and needs during decision-making process**

Data extract	Subtheme	Theme
"Yes, we can talk about technology uncertainty in relation to the employee behaviour…" *"…that means if the company goes into liquidation or administration that was our main worried…"* *"When it comes to adoption decision-making on certain thing like integrating a new platform or a new technology definitely, we accessed them whether we have the purpose for them, probably necessity of them, we just make primarily assessment of them whether the technology will improve our network or quality…"* *"…why do I want to change, why do I want to change my current infrastructure? If is it good and it would do better, it would improve my operation and these are the things they have to prove to us, convince us…"* *"Do we need to implement certain technology that could not enhance the experience of the learners? …other resources sufficient for our staff to be delivering with, All these factors when you put them together uncertainty will come out that would be triggering point to go and looking for certain systems…"* *"Now we have to look at department that is going to make use of it effectively; if it is accounting they have to look at, if they can able to work with it. If it is operational, they have to look at it if they can be able to work with it"*	Uncertainty driven	Technology Context
"Then you now look into your existing business, if you incorporate this new technology what is going to be the effect. How can it help you to improve your output, services and how to grow the company?"	Compatibility	

"Once they identified this new technology they can now match it against our existing technology and say that is what we have either better or worse and present it to the business and say use it" *"The performance of the server without altering the exiting application you have or without the need for you to start thinking to buy a bigger infrastructure"* *"So, I have particularly issue in my business now, which is focus point now. Which system is going to implement that? If I go into a new system which is going to slow down my business, am not going to do"* *"we do the compatibility test and we do cost evaluation analysis"*		
"When searching for information, I will look into my existing technology we are using and compare with this new technology we want to adopt" *"The existing solution we have now is compulsory everyone has to login, and then send text to reach other part of the world through our solution; we Find it is difficult, they don't want to go online"* *"Then we said no the company has to go more to ICT base, rather than just normal manual. We are able to find out, throughout the years we have been developing more and more into better systems for us. At some point we used to have typewriters before"* *"We are paying people; we need to account for what they are doing and how they are doing it outside. Obviously by getting ride off the old ways of doing it"*	Legacy technology	
"Yes, with time technology is moving very quickly and our learners need to have best experiences" *"The client might be discouraged and goes to your competitors elsewhere where they are using the advance tool; because everyone believes in an advance technology"* *"Efficiency is paramount, very important. You need to be able to deliver things quickly to the customers, but it is fantastic now with technology"* *"We see that there is something missing from our training or our services will provide that could benefit learners. These are factors that would trigger us to look for further*	Relative Advantages	

information" *"Does it deliver the right things does match overall infrastructures that already exist within the organisation?"* *"With the equipment we put here into this particular build, reflect customer experience and used the actual systems in place"* *"The benefit of it, how better off we would be after adopting such a system in the organization and other factors just to put them one at a time and review them"*		
"Looking for someone that has the knowledge, the technical knowhow of that technology before we can actually embrace it" *"Research to find out about it if it really exist or not, how does it works, who invested it or what is the process of implementation"* *"I think the first one is technology how does it actually operate, are we able to adopt such technology in the organisation"* *"We might speak to provider, invite the actual provider to come in and say tell me how I might implement this technology"* *"If the technology is not appropriate can we source technology which is able to deliver and we are able to install it. Do we have able men that capable in delivering this particular product?"* ***"…to demonstrate the capability of the company in using the technology…"***	Lack of technical know-how	
"We try to find out the benefit in relation to the cost if the cost is very good, very low and the benefit is very huge then we are actually going to go for the adoption of the new technology" *"Another factor that helps me to make a decision is the price. Is not everything that is expensive is good. As a small medium organisation we need to work on a budget"* *"So the first thing we do is to see what it is, whether we need it and if we need it, we would see…, we always look for options who is given the best one in terms of price, quality and security"*	Perceived affordability	

"My budget is this and you come and sell something five times higher than my budget completely out of questions" *"The first thing was the cost that was very pretty simple and destabilise of the whole systems"* *"If it is relevant them, we sat down and look at the budget, whether is affordable. If it is affordable to us"* *"We will speak to relevant users and check through if it's friendly both internal and externally, check the cost…"* *"Can we finance it, is the technology appropriate?"* *"We diagnose and analysed then again we if increase the process how much that cost, how much time would be safe and how much time would take to recoup that investment for that new technology"* *"What is going to be cost, and benefit if you move into a new technology?"* *"What are the costs to a company embedding such a system, what are the benefits and what are the outcome of having such a system in place"*		
"Eventually call up the hosting company to tell them our requirements and asked some questions; could you do these, are you sure the server will be online 24 hours, can I increased the RAM?" *"…simply put, is it effective for us, is there any benefits for the company should adopt this? How does it exactly operate; is it something that needed for the company?"* *"Normally, the two directors look at it, if it is something that is going to be relevant, or not relevant to the business. If it's going to be relevant to the business we normally call them in, the ICT subcontractors to come and give us a brief on it and why did you want us to subscribe to this system or equipment"* *"now as a standard way which our guys run around the country, the whole world and process their order, everyday activities, their emails, project discussion, logs, all in one collaboration site for our company that is their office"* *"If it can aid and assist us, help us in any form of activities, that can aid what we are doing"* *"Their accessibility, easy to work without limit that means I*	Fit for purpose	

Data extract	Subtheme	Theme
am not confined, I have to be in the office. That I decide to work at home with all information I needed"		
"The only thing you might be thinking, that might actually mitigate you that might actually be like a drawback. If anything happened in the future to this cloud issue, how we are going to ratify it" *"There are shortcomings, am sure you know but yes the challenge sometime comes from the security"* *"You see based on actually what we need, both technically and practically, it's you that will say something this could do, I cannot do but I know how my business operates. How it is suitable for your thing? Sometime is too much, we don't need that much…. We peak and choose what is suitable for our business"* *"How safe is it to actually have our client data on cloud or save on cloud base technology basically. So we just need something that is reliable and efficiency"* *"Before we used to do it ourselves, this was a kind of risk because we are not experts. We used to have lot of problems"*	Perceived risks and security	

Data extract	Subtheme	Theme
"They do have significant impact because most of the people that might use your technology might not like it" *" and they told us we have tried it is completely not what we want"* *"Internally is to discuss it with the IT department people who worked in the ICT which have more knowledge in the field basically to elaborate on the uncertainty we have they were able to explain and satisfaction our needs and requirements"* *"User Access Testing that is fundamental part of our process in adoption of a new technology, we want to make sure is suitable for the end user"*	Users acceptance information	Organisation context

"Other challenges we face are on user functionality, making sure is appropriate for the end users both internally… and is applicable for the clients at other end" *"Discussed with staff because at the end of the day you buy it they don't use it, there is no point…"* *"Obviously we will ask our staff to give us feedback. Would this pic of hardware or equipment would be helpful to speed up your process or efficiency"*		
"And the first thing we were looking into was automate on our operational tasks" *"How can they improve our own day to day operations? How can they make my work more efficiency and how we can work better?"* *"Yes, with time technology is moving very quickly and our learners need to have best experiences. We see that is there something missing from our training or our services be provided that could benefit learners. These are factors that would trigger us to look for further information"* *"It has to be something adoptive, something the management, staff and operational staff can be able to use. When it's done, we now make an arrangement to buy it"* *"The benefit of it, how better off we would be after adopting such a system in the organization and other factors just to put them one at a time and review them?"* *"Am going to go into a system which is not going to increase my efficiency and addresses my current need, current challenge that I have then we choose"* *"we are also very positive and patience's in about getting access to new technology, exploring new things more of automation stuff to reduce human input"* *"...and how can they improve our own day to day operation"*	Efficiency driven	
"The whole technology has been redefined and come out better in an advance way, everyone wants to meet up in the industry. Want to keep updating themselves in the industry, so you have to move up that is what is happening in the industry" *"Most of the time in software industry, some time you have a client with a requests, I want my application, the solution*	Industry innovation growth	

to be hosted in my office. Then somebody comes I want the solution to be hosted by my side I don't want someone to hack into it" *"the industry that we are in is moving very fast as technology is really getting advancing, every day, every hour at the moment we are talking to each other am sure there must be something new that comes out, every few seconds am sure"* *"Only the one that have direct impact to our business we adopt. Apart from that most of the cases we know it is not right. What we do is pure service"* *"because we want to have the most competitive product which is interest the clients, give them the best practice and delivering the best services to clients is the interest of ourselves, the clients, and the regulators because as a business aspiring to grow and be competitive in the industry"* *"Because as l had said we are just a service industry it is not everybody that is expert with the computer. They need simple technology that they can be able to use and give them ends result"* *"Everyone wants to meet up in the industry you want to keep updating themselves in the industry so you have to move up that is what is happening in the industry"*		
"If there is a training that will take place before adopting that new technology, may be someone has to be trained" *"They respond to your issue immediately and they are there twenty four seven to help you to resolve any issue that you have"* *"Knowledge feed and briefs them properly so that they understand the technology and appreciate it they can actually make their point out clearly and loud"*	Owners support	

Data extract	Subtheme	Theme
"Your competitors as well because you have competitors who shape your company because you want to be better than your competitors and most of this times you have to look into existing technology of your competitor" *"The benefits and functions there would be competitors research"* *"There is a new opportunity from there; we get new contracts based on technology we have put in place"*	Competitor intelligence gathering	Environment context
"Your growth comes from your customers, before you can grow successfully in the industry; it means you had enough customers who have subscribe to your product or services" *"For us most of it depend on our clients' requirements, for us generally, because we have a lot of clients we work with and depend, what their mind want"* *"You need to be able to deliver things quickly to the customers but it is fantastic now with technology"* *"We see that is there something missing from our training or our services be provided that could benefit learners. These are factors that would trigger us to look for further information"* *"Clients' feedback as well if they are the one involving in the technology output"* *"So our technology adoption is based customer requirements"* *"We get feedback from everyone's that works inside the business"*	Customer information gathering	
"You have to look into the credibility of the company you have to search online for the history of the company…" *"Mainly functionality, what does each of them provide, we need to know, what function they can provide, which one is the closet to the one they can provide…"* *"I had mentioned earlier because technology is moving so quickly it could be that the services you are providing are*	Provider credibility	

not fully enhance system services to our learner. It could be gaps that need to be filled"		
"We then look for supplier of this service and like with our self, the same whether we can get it rather look for company that can deliver all the features we are looking for"		
"If you don't scan the environment very well in the industry to determine the true provider, people who can actually provide you that technology and adequate guarantee you 100% quality of that technology, I think you will be making a mistake just jumping into conclusion that this is the company you are going with"		
"We saw it is a massive company that gave us the confident and then"		
"And from customer point we have dedicated account manager who they put their feedback back talk to their clients you know"		
"When we went to meet them we have a requirement checklist and check with the providers who can provide the solutions"		
"If something goes wrong with big organisations they can actually easily refund and payback because of the name built for themselves in the industry"		
"There is a market we can see. The existing solution we have now is compulsory everyone have to login into the internet then send text to reach other part of the world. We are market driven what so ever that we move us to next level that is what we thinking about"	Technology market growth	
"I remember we started very small scale as soon as we are looking at the potential of the market we brought different technology"		
"But then you don't know what else in the market, so you go to these different places and people and say what you are using and you are not comfortable with it"		
"You have to keep yourself update, you have to register with some technology news provider online, and they update you when never a new technology comes up"		
"And then we started looking where the next market is where the strength is and where it is heading to and then"		

Data extract	Subtheme	Theme
we have an option to follow the threads quickly; so that we will not completely wipe out of bulk SMS market" *"We are looking at the potential of the market we brought different technologies in and we are also very positive and patience's in about getting access to new technologies, exploring new things more of automation stuff to reduce human output"* *"It a one-stop shop. We have our day to day work to do. But as a small company we don't have the empowerment for the research and development. To develop mentors, nowadays the things that big companies do this can of things that have s mentors to do for them, always looking for new technologies"* *"We delivered is in there interest and the way we can achieve that is driving by emerging ICTs by adopting those ICTs. We have our contacts, and I contact some of them for emerging ICTs"*		
"You might be looking into government policy in relation to government data protection" *"Is there any bearer from the government? Is there any legal legislation in place for, that could also give us hindrance, to accept it, adopt it or to take it as a whole?"* *"Definitely we work with government agencies and working in partnership with those so... we have to ensure that we are working on the standard that was the government"* *"With regulator increasing, data protection for example would acknowledge their general feeling against some certain technology"*	Government policy	

Appendix 4d Data extract from answers to the question: How and why do SME managers scan the environment, seek and acquire information when making decision on emerging ICTs?

Data extract	Subtheme	Theme
"Most of the cases we go to different exhibitions we do a lot of conferences in and out…" *"We go to trade show, seminar there is one in Chicago*	ICT Professional event	Sources of Information

next month, there is one in Dubai and there was one in London few weeks ago where the technology provider come and exhibit actually, show things and how things are moving…" *"Our guys locally, nationally in field go out and sale, go to exhibition etc., not just in our field but other field as well. Looking for a new thing we can adopt that is good for us"*		
"Take for instance I had been approached by a company to use their cloud computing system or whatsoever…" *"Externally is to consult the expert in the field to discuss it with the company that knows the systems to the depth and clarify our uncertainties"* *"But, you know most of our information about new technology comes from our ICT subcontractors they give us information about new technology"* *"We are in technology world any way but we have to basically, be consulted by those companies that want to deliver services new to the world, emerging technology"* *"Before we use to do it, this was a kind of risk because we are not experts. We used to have a lot of problems, but since we decide to use specialists and experts they were able to help us in many cases since they have started with us, we have not had any major problems with server and computers so far so good"*	Expert as a source of information	
"You familiarize yourself with the update regularly on the Internet as much as you keep yourself inform on the Internet you get all these information easily" *"We… knew via the internet…"* *"We have forums; look information these days is just a matter of click, you know, It doesn't take you that long"* *"By searching Google, Yahoo, also by forums and other people that have adopted this technology you can see from their experience and how they have done as well"*	Online professional community	
"The hosting company customer service who gave us the confident and then we tested it for a while and see	Word of mouth recommendation	

its reliable" *"if it becomes necessarily sometime I call them try to know them and whether there is any concern about it or facing any challenging introducing a new thing a kind of feedback from them, transparent feedback"* *"I think mostly like word of mouth recommendations…what the industry is doing now"* *"So in this situation we normally call them in to tell us more about this system"* *"We you speak to the environment you obtain more information as you can which will form the feedback to that very business case process, we speak to all relevant users and stakeholders to deliver a product or to adopt those products or technologies"*		
"Somebody contacted me I will contact somebody that might I have used it before…" *"We speak to peers within the industry and say what has been your own experience or challenging around that in addition to that we will then conduct UAT…"* *"What pros and cons, is it suitable as you mention before and …stakeholders these are all sources of information pull together and then make inform decision from the information"*		
"The way business is structure depending on which avenue decision requires there is personnel to make and direct that decision to the right person and proceeds to make that ultimate decision." *"The next stage is to call the management team. We have our meeting which we normally do, call them and I say okay this is the product we want to adopt and put in place, this is how is going to work, this is the product."*	Employee as a source of information	

Research question 3: What factors influence SME managers' information behaviours during their adoption decision-making process and how do these factors influence their information use and behaviours? Is there any kind of information behaviour that drives their information behaviour?

Table: Data extract and themes on influential factors on information sources selection and information use

Data extract	Subtheme	Theme
"I think it was useful, because we relied so much on them and because we don't have enough time to go to the internet to check the information."	Information Usefulness	Influential factors
"How they treated their previous customers, those are the information you are looking into before you sign up with any company regarding your cloud computing or adoption decision" *"I call them try to know them and whether there is any concern about it or facing any challenging introducing a new thing a kind of feedback from them, transparent feedback"* *"They can share their experiences and expertise with us also to see if there are any benefits for them. What is the benefit of adopting it?"* *"What we would do once we will go and verified the feedback we received from the very sources and find third source externally see what feedback is from the third sources"* *"We speak to peers within the industry and say what has been your own experience or challenging around that in addition to that we will then conduct UAT"* *"What pros and cons, is it suitable as you mention before and ...stakeholders these are all sources of information pull together and then make inform decision from the information"* *"Eventually, asked other people who had encountered with them. Although we had some who has concerned, who felt their customer service was not the best"* *"The guy who's already using it and they would tell you, is very good, you can use it, it is fantastic and it does this and*	Openness to other people experience	

that…"		
"And of course the sources would be justified on the base of their reputation" *"Personally I relied on them these shops because that is one stop shop for you, is very contemplating you are going anyway not just for education you are going there for your own business"* *"When we received information on the service of a cloud provider we look at the information how it fit to our needs and requirement. So we can scan through collect the information from the company. We can say right this company for example is able to meet such and such requirement for us"* *"Gather all the data online and see how does it applies to us and as a company what can we benefit from that. We become certain as we got all the information through that process"* *They give us recommendation on how it can be done. And we felt well it an advantage because if we are not around they can be able to monitor the server"*	Perceived information sources credibility	
"I think for us it easier, as we are a service company, we read a lot to update our self with new ideas, new technology"		
"We adopted a particular technology with another company before but there was a lot of problem with the company. So during the process of adopting this new technology we went for a credible company" *"My decision its takes a while, I have been in IT for long and I had experience a lot"* *"But in the past the reason we do it is because we have learned from our own uninform decision-making the past, where we have failed to listen to users"*	Previous adoption experience	
"I tell head of my technical guys, is about time now we need to investigate this technology thoroughly *We look at the information how it fit to our needs and requirement. So we can scan through collect the information from the company"* *"is not working for him and does work for me I might not have tested it enough or use it enough so I still have to go*	Perceived Information reliability	

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back my other people those help my decision making" *"...not just by reading information online but you have to read and review in relation to your product that you are looking for"* *"I have said it on the forums and say that is true. It helps and guides me to make my decision"*		
"The information will get from customer service of 1 and 1 in those days was useful to us" *"Yes we got expert advice, the information from the Internet and company themselves. So it is pretty detail and pin point and clarifies all the uncertainties we had"* *"If it is of use to us we asked questions and we are happy with the answers and then we proceed to the next stage"* *"The information will really help you to make up your mind. If the information you got from the review online is bad…"*		
"That feedback, it would really play significance in your adoption decision making process, if you are actually thinking of joining that company"		
If competitors have adopted, it is best practise for us to do too so otherwise learners are not getting the best experience" *"Yes there is a lot of technology out there which other people have adopted and it's easy to come into conclusion because many of our peers have adopted it we should adopt it as well"* *"Again we look at other business, retailers and other people within the industry currently using it and again are all about trend"* *"You checked the review that comes from the forum, how people are using it, what do they say about it and what is the feedback before you make a decision"* *"We saw some of our business. I can see how reliable and robust is it and last. It's user-friendly and we are going to adopt"* *"That is the point we actually take decision we can do it somebody has done it. I think we can give it a trial"*	Herding events	
"If it's a new technology we better wait and see until it has	Testimonial	

proven in the market or something one else has already using it and given there thought behind it and feedback"		
"Also we always asked clients tell us or we call it testimonial from exciting other users, who probably using it. For a year or a month probably, we always asking for feedback from them"		
"How we make decision based on recommendations, based on people that have used it, if they are happy with it"		
"They gave us advise on the systems it could be possible some of them have utilized cloud systems before so their experience in the field, so they can share their experiences and expertise with us"		
"Likewise, other users may I have had negative experience which quite often results in costly bad decision. So if we can learn from other people lessons it would save us from making a bad decision on adopting a new technology"		
"You get recommendations from active customers also who are actually using them"		

Appendix 5 Nvivo figures

These figures show percentage of coded sources, graph and reference showing the supporting cases for each themes and subthemes.