5

An Interpretive Approach for Data Collection and Analysis

5.1 Introduction

This chapter describes the research methodology employed in this book to gather and analyse the necessary data to address the research issues and to achieve the intended contribution, and it also explains the rationale for the use of this research methodology. Initially, the chapter in Sect. 5.2 discusses the epistemological stance and the suitability of the interpretive stance for the research, as justified in Sect. 5.2.1. It proceeds to explain and justify the reasons behind the selection of a qualitative methodology in Sect. 5.3. Thereafter, the adoption of the case study strategy is justified in Sect. 5.4. In Sect. 5.5, it is explained how the methodology is employed to elicit data. Then, data collection methods are discussed with a clarification of the rationale for choosing them in Sect. 5.6. The chapter moves on in Sect. 5.7 to discuss the data analysis strategy that has been adopted and how certain strategies are used to ensure the trustworthiness of the research. Finally, the ethical considerations are discussed and a summary is presented.

5.2   Research Paradigms

In order to be able to conduct a solid piece of research that delivers what it promises, it is helpful to have knowledge of the basic philosophical concepts. The philosophical basis of any research should outline the view of the nature of knowledge from two important aspects of research (Henn et al. 2006): What can be considered as knowledge? And, how that knowledge can be acquired? This means how is reality being viewed and how valid and reliable knowledge about this reality can be gained.

The choice of a research methodology needs to be guided by a research paradigm which has a theory of the nature of reality, ontology and a theory of how knowledge about reality can be gained, epistemology (Myers 2009). The term "paradigm" has been used quite loosely in academic research; it can mean different things to different researchers. The research paradigm refers to the progress of scientific practice based on people's philosophies about the nature of reality and knowledge (Collis and Hussey 2009).

IS research is not rooted in a single theoretical perspective; therefore, there is plethora of philosophical assumptions which can be used according to the phenomenon under research (Orlikowski and Baroudi 1991). AIS is multi-disciplinary; therefore, the identification of an appropriate research approach is not a simple task. In the areas of the social sciences and IS, according to Sedmak and Longhurst (2010), it appears that a common language is absent because the possible approach areas diverse as the members of the research community itself. There is no uniform agreement about the ontological and epistemological basis of social science (Guba and Lincoln 1998) or information systems (Orlikowski and Baroudi 1991). However, a research paradigm is a world view that guides researchers in their work and each paradigm assumes an ontological, an epistemological and a methodological perspective (Guba and Lincoln 1998).

Ontology is concerned with ideas regarding the existence of and relationship between people, society and the world in general, "what is there in the world?" (Eriksson and Kovalainen 2008, p. 14). It is

concerned with the nature of reality, that is, whether reality exists independently of people's consciousness and, therefore, should be treated objectively or is the product of people's consciousness and therefore should be treated subjectively. Epistemology is concerned with "What is knowledge and what are the sources and limits of knowledge?" (Eriksson and Kovalainen 2008, p. 14). It is concerned with what counts as knowledge in a field of study. Methodology focuses on the process of research as a whole. It determines the important relationship between theory and method and reflects specific ontological and epistemological theoretical views which help researchers to choose a suitable research method (Bryman 1988).

The purpose of this section is not to provide a comprehensive account of the philosophical arguments of different research paradigms, but rather to establish the ontological and epistemological approaches followed in this study and their impact on selecting the appropriate methodology in the context of the research.

Different research approaches could be used to address the research question. These approaches can be classified according to their philosophical assumptions. The work of Burrell and Morgan (1982) has offered a classification of four social science paradigms which can be used to generate fresh insights into real-life problems. The four paradigms are: functionalist, interpretive, radical humanist and radical structuralist. These four paradigms are based upon two dimensions: the regulation–radical change dimension and the objective–subjective dimension. The regulation–radical change dimension organises theories according to the degree to which they assume that the world needs to be regulated (e.g. functionalism) or changed radically (e.g. Marxism). The objective–subjective dimension organises theories according to the degree to which they assume that social phenomena have an objective existence independent of social agents and are therefore "out there" to be discovered (e.g. positivism or empirical realism) or created by social actors and therefore can only be understood through the actors' own subjective interpretation of them (e.g. interpretivism) (Saunders et al. 2009). Each paradigm has its own ontological, epistemological and methodological positions.

Positivism has been defined as "an epistemological position that advocates the application of methods of the natural sciences to the study of social reality" (Bryman 2004, p. 11). According to Collis and Hussey (2009), positivism assumes that studies conducted in the social sciences should be conducted in the same way as studies carried out in the natural sciences. Proponents of technology as an exogenous force for organisational change have tended towards positivism. They posit IT as separate from humans and organisations and directly impacts human behaviour and organisational characteristics (Orlikowski and Baroudi 1991).

Interpretative research aims to gain deeper understanding of a phenomenon, which can then inform other situations, rather than seeking generalisations. The intention is to increase understanding of a phenomenon within particular situations, where the phenomenon is studied in its natural context from the participants' perspective and the researcher does not impose a priori understanding of the situation on it (Orlikowski and Baroudi 1991). Walsham (1993, 1995b) highlights the valuable contribution of an interpretive approach to IS theory and practice, as the focus and concerns of IS research have been shifting from technological towards social and organisational issues of IS. When understanding IT as neither fixed nor universal but as emerging from reciprocal interpretation and interaction, an ontological priority is given to the role of the human in IT use. This is a shift away from an abstract understanding of IT to a view of it being social and grounded in specific contexts. A methodological shift is also entailed in this perspective, as researchers' accounts of technological use using this view conduct detailed interpretive research (Orlikowski 2009).

5.2.1 The Choice of Interpretive Paradigm

The particular paradigm adopted for a particular research project is partly determined by the dominant paradigm in the research area and partly by the nature of the research problem (Collis and Hussey 2009). The research aims at understanding the inter-relation between IAF

adaptation and ERP systems introduction to increase understanding of this phenomenon within a particular situation, where the phenomenon is studied in its natural context from the participants' perspective. In particular, the research is interested in looking at how the IAF changes to cope with the changes in internal control and risks brought by ERP systems in order to promote corporate governance practice. This study aims to provide evidence of a non-deterministic perspective, to increase understanding of the phenomena within a particular context and to examine the phenomena from the participants' perspective. Interpretive research does not predefine dependent and independent variables, but rather addresses the complexity of the situation (Kaplan and Maxwell 1994).

Considering the scope and depth of the research, an interpretivist paradigm is adopted. The phenomenon under study will be understood in its real-world context, and lessons will be elicited drawing on the analysis. The phenomenon under study has organisational and social focuses; therefore, an interpretivist stance is appropriate. The main philosophical position of the study is the interpretivist point of view, where the main concern is about subjective and shared meaning. This philosophical position is interested in how social groups understand social events and settings. Interpretive study starts with the assumption that changing and individually constructed reality is only accessed through social constructions such as language (Eriksson and Kovalainen 2008). The research does not predefine dependent and independent variables; however, it is concerned with the full complexity of human sense making as the circumstances appear.

Interpretive research in the IS field is concerned with understanding the social context of ISs. Interpretive studies do not aim to prove a hypothesis, but explore and explain how all factors are related and interdependent in a particular social setting (Oates 2006). This research aims to understand what happens in that setting from the participants' perspectives without imposing the researchers' previous understanding or expectations.

According to the subjective epistemological view, there is no possible access to the external world beyond our own interpretation of it.

In other words, from interpretivism's epistemological view, knowledge is available only through social actors (Eriksson and Kovalainen 2008). However, the interpretive paradigm represents one strand in IS research, but there are signs that interpretivism is gaining ground (Walsham 1995b).

Using the ontological assumptions of interpretivism, the study considers that the world is socially constructed and can only be understood by examining the perceptions of the human actors. Epistemologically, the study attempts to minimise the distance between the researcher and what is being researched. The researchers will be involved in different forms of participative enquiry. Consequently, as a social researcher, it is important to understand the social meaning of phenomena with the purpose of providing reasons for the occurrence of social phenomena. Methodologically, the method is so closely intertwined with the ontological and epistemological assumptions of the paradigm that it permeates the entire research design. The study adopts an empirical approach focusing on human interpretations related to ERP systems. The method for such interpretative investigation is often an in-depth case study (Walsham 1995a).

Most of the previous studies have adopted a positivist paradigm, where the world is simplified in objective cause–effect relationships. Researchers have referred to such approaches' limitations in giving deep knowledge about a phenomenon (e.g. Walsham 1993). This study is concerned with a practical perspective on internal audit change within the ERP systems environment particularly. Analysing practice is central to this research work; therefore, the research methods are contextually dependent. The interpretive approach increases understanding of the implications of implementing IS in organisations (Orlikowski 1991). The aim of this study is to increase understanding about possible consequences of implementing ERP systems for corporate governance processes and the influence on the IAF. ERP systems are understood in this context as socially defined and thus relevant only in relation to the people engaging with them (Orlikowski 2009). Field studies drawing on interpretive approaches offer some account of what actors at various levels within organisations are doing with the technology. Orlikowski and Yates (2006) suggest that interpretive approaches

are particularly valuable as they afford the possibility of gaining a view of IT-mediated organisational change by focusing on the everyday practice of actors. A focus on auditors' practice entails a detailed examination of the micro-level interactions that are shaped by ERP and institutional conditions.

The nature of the research problem where there is a need to understand the interplay and the interaction between the context and the IAF implies selecting the interpretivist stance. The study aims to increase the understanding of the IAF adaptation rather than quantifying significance or causality. According to Pettigrew et al. (2001, p. 699), "change explanations are no longer pared down to the relationships between independent and dependent variables but instead are viewed as an interaction between context and action".

The literature review and analysis presented in the previous chapters indicate that there are many managerial and technical issues related to the introduction of ERP systems and their impact in the accounting and auditing field. These impacts appear to be multiple, complex and inter-related. Hence, how ERP systems affect the IAF cannot be separated from their organisational, technical and cultural context. Therefore, there is a need for a research approach that allows understanding ERP systems' impact on the internal control system and the adaptation of the IAF to cope with the new working environment. For these reasons, an interpretive methodology is considered to be the most appropriate for this study. Moreover, prior IS studies find that the interpretive paradigm is better equipped to appreciate the richness of a social context in comparison with the positivist paradigm (Orlikowski and Baroudi 1991).

5.3   Qualitative Research Methodology

Methodology refers to the overall approach to the research design, and it should reflect the assumptions of the selected research paradigm (Collis and Hussey 2009). In this case, the research is designed as a qualitative investigation as described by Walsham (1995a), as it will be discussed in Sect. 4.4.

Quantitative methodology fails to take into account the research context and the subjective meaning of social actions (Taylor and Bogdan 1988). It has been criticised as offering only snapshots of a problem (Avital 2000) and as it can potentially ignore variables that are not included in the research model. Although it can help identify the correlations among variables, it provides little in understanding the direction of the causal relationship. These weaknesses, therefore, should be made up for by qualitative study.

Qualitative methodology is based on intensive study of all aspects of one phenomenon to see their inter-relationships. It is chosen when not much is known about the issue understudy. It can help in gaining deep understanding of the research context to develop richer knowledge of the phenomena under investigation, especially social conditions (Silverman 2010). Creswell (2009) argues that qualitative research attempts to report multiple perspectives in order to develop a holistic picture of the issue understudy. Qualitative research is appreciated by several authors (e.g. Patton 2002; Berg 2009) to explore uncovered meanings that people assign to their experiences of the issue under study. Creswell (2009) indicates that qualitative researchers often talk to the participants face to face and observes their behaviour in context. Therefore, the researchers explore and understand the meaning individuals ascribe to a social phenomenon. However, Yin (2009) has argued that qualitative researchers are often less rigorous and provide less opportunity for generalisation. Despite such shortcoming, qualitative research can be used for the study of social phenomena that do not aim at providing a general law.

5.3.1 Justifications for Using Qualitative Research

Adopting qualitative research was based on the need to align theoretical and philosophical assumptions, to maximise the ability to understand the emergent perspectives in such dynamic and complex social phenomenon and to get the rich data required. These considerations are discussed in detail to ensure and demonstrate the coherence and consistency between theoretical and philosophical underpinnings.

First, qualitative research methodology is applied to develop a rigorous consistency between theoretical and philosophical assumptions. Since the research problem is context driven, interpretive in nature and interested in understanding how things work, qualitative research is believed to be an appropriate one for conducting this research. The philosophical perspective for this empirical study is interpretive to gain "knowledge of reality" through the study of social constructions (Klein and Myers 1999). Accordingly, choosing qualitative methodology is consistent with the main aim of the framework which is the interpretation of the phenomenon under investigation. The research applies a framework based on an interpretative institutional lens that can generate understanding of the phenomenon and map key contextual and procedural factors. By using qualitative methodology, the researchers consider social properties and realities as the outcomes of social interaction, as supported by Johnson and Onwuegbuzie (2004). This is particularly a phenomenon of the IAF adaptation that is developed through the interaction between individuals and their contexts rather than something out there and developing objectively.

Second, the research examines in-depth complexities and processes in a less acknowledged phenomenon. In order to understand the dynamics of the process through which ERP systems and the IAF are co-evolving in improving the corporate governance practice, the qualitative research approach was chosen. Enterprise systems are particularly problematic to approach as an area of study, considering that their implementation and use are very much related to the organisational context in which they are embedded (Sedmak and Longhurst 2010). The qualitative study here is based on the research aim, which is to generate in-depth understanding. As previously explained in Chap. 2, there was a scarcity of empirical qualitative research and little research has examined the IAF in the context of ERP systems. Therefore, qualitative research is regarded as the most suitable option for such inquiry as this research intends to contribute to filling this epistemological gap in inter-organisational relation studies. This may allow the researcher to understand the nature and the complexity of the phenomenon under investigation. Flexibility to embrace emergent perspectives or address

un-predetermined or controlled phenomena cannot be achieved through quantitative methodology.

Third, qualitative methodology was chosen as the qualitative data provide contextual details. The qualitative methodology is therefore used here to provide contextual data (Bryman 1988). The qualitative research methodology is selected since the aim is to study issues in their natural settings, attempting to understand phenomena in terms of the meanings that people bring to them (Silverman 2010). It appears from the objectives of this book that the issues under investigation are confidential and subjective, with much contextual data are needed. Clearly, rich empirical data are required to provide more understanding. Qualitative data are collected in its natural setting, hence facilitating the effects and richness of the environment to be taken into consideration (Miles and Huberman 1994; Denzin and Lincoln 1998). Qualitative methodology allows understanding of the social and cultural contexts within which the participants work and approach them from different job positions, in order to compare and understand their viewpoints (Myers 2009). Therefore, applying quantitative methodology to the study of people is questioned and hence a qualitative approach is suggested.

So far, this research has justified the adoption of the interpretive paradigm, with the use of a qualitative methodology. The next section focuses on the selection of an appropriate research strategy for this study.

5.4 Selecting the Appropriate Case-Study Research Strategy

Having justified the use of interpretivism as an epistemological stance and the use of a qualitative research approach, this section focuses on selecting a research strategy. Remeniy et al. (2002) differentiate between strategy and tactics. While the first refers to the overall approach adopted, the second one is about the specific details of data collection and analysis. The research strategy refers to organised principles that

provide the procedure for guiding the research design and process. It describes how a given issue can be studied (Henn et al. 2006). Research methods mean the variety of techniques available to be used for data collection and analysis (Eriksson and Kovalainen 2008).

There are several qualitative research strategies that could be employed in AIS research. The choice of a specific strategy mainly depends on the research's aim and objectives (Creswell 2009). However, this section does not offer a comprehensive illustration and comparison of these strategies, but rather focuses on the case study as the most appropriate strategy for this particular research. The view of Myers (2009) is followed that the most appropriate research strategy for conducting IS empirical research following the interpretive paradigm is the in-depth case study. The following sections discuss the justifications for adopting a case study strategy.

5.4.1 Justifying the Use of Case Study

The nature of the research problem and objectives are fundamental issues that constrain the choice of the appropriate research strategy (Hessler 1992). The research strategy should be chosen appropriately to be relevant for answering the research questions (Eriksson and Kovalainen 2008). Therefore, the choice of the case study is based upon the research objectives. The case study is preferable as little is known about the phenomenon understudy, as the empirical evidence about the impact of ERP systems on the IAF is in the early formative stages and the research questions are how and why questions about events which a researcher has no control over (Benbasat et al. 1987; Yin 2009). The case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009, p. 18). It aims to give opportunity for diversity, complexity and avoid simplistic research designs (Eriksson and Kovalainen 2008). The case study focuses on understanding the dynamics present within single settings (Eisenhardt 1989).

The main characteristics of case study method have been identified by many authors (e.g. Cavaye 1996; Benbasat et al. 1987) as follows: it does not explicitly control variables; it studies a phenomenon in its natural context; it studies the phenomenon at one or a few sites; data are collected by multiple means; it uses qualitative techniques to collect and analyse data, and its focus is on contemporary events. Qualitative data can be collected through interviews, field notes describing observed events, papers or archives.

The IS field has witnessed a shift from technological to managerial and organisational issues. The case study is an effective IS research method, as the researchers can study IS in a real setting. The case study strategy offers the researchers the opportunity to understand the complexity of the processes taking place. It is a suitable way to investigate an area where few studies have been carried out. Case studies have become increasingly popular in IS research (Benbasat et al. 1987). There is a remarkable increase in the use of interpretative case research for investigating IS issues (Walsham 1995a). They enable examining the inter-relationship of IT with organisational activities and management practice. Orlikowski and Baroudi (1991) assert that the case study has confirmed its appropriateness to produce a sound interpretive understanding of human–technology interaction in the real social setting. Methodologically, case studies are associated with the interpretative approach (Eriksson and Kovalainen 2008). A positivist case study was rejected since it would reduce the case study to some cause and effect relationships (Orlikowski and Baroudi 1991).

In this study, the selection of a case study strategy is based on some considerations. These are to seek an in-depth understanding of the phenomenon; to meet the nature of the research questions; and to investigate and develop a mature understanding of the contextual aspects of the phenomenon.

First, the case study is appropriate when the research is conducted in the workplace and the researchers do not attempt to control any aspects of the phenomena (Collis and Hussey 2009). The case study is appropriate to investigate complex issues and to elicit intensive data regarding the area under investigation (Stake 1995). The qualitative approach used in this research is based on the ontological assumption

that reality is socially constructed. This means that it is based upon perceptions and experiences which may differ for each person and change over time and with context. Consequently, the data to be collected will be mainly rich qualitative data that capture the details of the phenomena under investigation. Furthermore, the interpretive paradigm aims to gain in-depth insight and it can be conducted with a small sample. According to Doolin (1996), the interpretive paradigm supports a less structured case study and emphasises the explanations of participants in the case.

In this research, the priority is to conduct a detailed examination of the case and utilise the rich insights into the contextual factors to enhance current understanding of the phenomenon under investigation. This study uses the case study to obtain different perceptions of the phenomena. Analysis seeks to understand what is happening in a situation of ERP systems implementation and look for patterns of IAF which may be repeated in other similar situations. ERP systems can have physical components; nevertheless, they are understood differently by different individuals and given meaning by the shared understanding which arises out of social interaction. The researchers approach the studied organisations with fewer preconceptions. The rich qualitative data gained from case studies are able to offer more insights into the complex social processes that quantitative data cannot easily reveal (Eisenhardt and Graebner 2007).

Second, to use a particular research strategy is governed by the status of research and theory about the research problem. As the research problem is in its infancy, then the case study strategy is in order (Hessler 1992). According to Yin (2009), the research questions are the main criteria to determine whether the case study is the proper technique. When the research questions are about how or why, then it is preferable to use a case study (Yin 2009).

Exploring the adaptation of the IAF through asking "how" questions, and finding reasons and triggers that are behind the event by asking "why" questions, is more associated with the use of case studies. Saunders et al. (2009) explain that the aim of exploratory studies is to describe a precise profile of persons, events or situations. The case study followed in this research can be classified as exploratory.

Third, as the boundaries between the phenomenon under investigation and context are not clearly evident, the experiences of the actors are important and the context is critical; therefore, the case study method is recommended (Benbasat et al. 1987; Yin 2009). Case study strategy seeks in-depth understanding of the context of a phenomenon, investigates a predefined phenomenon and contributes to knowledge by relating findings to generalisable theory (Cavaye 1996). The case study pays more attention to contextual factors and characteristics (Yin 2009). The case study method is appropriate for capturing practitioners' knowledge. Its design allows grasping a holistic understanding of the phenomenon under investigation (Eisenhardt 1989). This study takes the form of interpretive case study research as interpretive case study strategy tends to yield highly accurate results as it has contextual relevance. The interpretative case study is appropriate when theoretical knowledge on a phenomenon is limited or when there is a need for context capturing. However, Orlikowski and Baroudi (1991) suggest that the positivist approach dominates IS research and interpretive case studies can inform IS research.

The focus is on the IAF adaptation which is a contemporary phenomenon that should be studied within its real-life context which includes the ERP system. Interpretive case study research is undertaken because it promises a rich description of contexts. The role of case studies in interpretive methodology is to locate the IAF in its organisational contexts in order to help understanding of how the current structures and practice are shaped. In this regard, this study adopts exploratory case study research in order to understand the IAF adaptation associated with ERP implementation in an institutional governance context that shapes current auditing structures and practice.

There is further support from the literature for adopting this research method. First, several scholars have highlighted the need for more auditing case studies (e.g. Al-Twaijry et al. 2003; Arena and Azzone 2009). Second, this type of case study has been selected since little research has adopted this method for investigating the postimplementation stage of ERP studies, as highlighted in Chap. 2. There has been a call for detailed interpretive case studies of ERP system-related issues

(e.g. Caglio 2003; Kuhn and Sutton 2010). There is a lack of published scientific research regarding the IAF in the ERP systems environment as most of the IAF studies have been published by practitioners. Therefore, the case study is well suited to capture the knowledge of practitioners and apply theories to understand the phenomenon, especially in areas where the researchers are lagging behind practitioners.

In sum, to judge the appropriateness of the case study method, Benbasat et al. (1987) suggest a number of questions. Can the phenomenon of interest be studied outside its natural setting? From the previous discussion, it is clear that the IAF in the ERP systems working environment cannot be investigated outside its context. Must the study focus on contemporary events? It is evidenced in the literature that most of the organisations that started to implement ERP systems have just entered the postimplementation stage and start to face new problems. Is control or manipulation of subjects or events necessary? There is no need to control any variable in the research area as the aim of the research to get the practitioners' experience and their natural response to the problems they face in that context. Does the phenomenon of interest enjoy an established theoretical base? It has been clear from the literature review that there is no study that has looked at this problem. Therefore, there is no theoretical base for studying this phenomenon. Thus, for all these reasons reported thus far, the author claims that case study strategy is appropriate for the research presented in this dissertation.

5.4.2 Overcoming the Limitations of Case Study

Even though the case study is a distinctive type of empirical inquiry, field research is not without its limitations. Generally, researchers have no control over independent variables during the case study that may limit the internal validity of the conclusion. One more limitation is related to the interpretations of case study reports. However, it is recognised that there is no reality that can be uncovered away from the practice of its representations: "there is no such thing as a truly 'correct' and 'balanced' case study—that two researchers are likely to produce two

different case studies from visits to the same organisation" (Humphrey 2001, p. 97).

Additionally, one of the criticisms of the case study method, that cannot be dismissed, is related to the risk of bias, which is a common criticism of field studies (Yin 2009). The potential bias is avoided as far as possible in this research by data triangulation through cross-checking data with organisation records and descriptions from other individuals. In addition, developing good relationships with some of the interviewees to build trust and cooperation reduces any tendencies on their part to misreport events in ways that would favour either the organisation or themselves.

The main limitation of the case study strategy is that the data gathered are related only to the case under research. In addition, case research may set up relationships between variables but cannot point out the direction of causation (Cavaye 1996). They do not provide unproblematic facts regarding absolute reality; therefore, they lack external validity. Therefore, it is difficult to justify the findings statistically (Smith 2003); however, case research result generalisations are made for theory not for populations (Yin 2009).

Some verification strategies are followed in a rigorous fashion to assure the credibility (internal validity), the transferability (external validity) and to mitigate the risk of bias such as member checks when coding, categorising and confirming results with participants. This is explained in Sect. 4.7.5. Despite the case study limitations, the data collected from a case study are richer in details and insights (Smith 2003). Case study method is selected as a proper research method for the study, and the unavoidable weaknesses of case research are accepted as method-related limitation of the research.

5.4.3 Single- or Multiple-Case Studies

Case study research strategy is versatile and can investigate single or multiple cases, depending upon the underlying philosophical assumptions of the researchers (Myers and Avison 2002). A single case is often selected when the case is both an exemplary case containing unique

circumstances and a revelatory case being one of the first examinations of the phenomenon (Yin 2009). Therefore, in the light of the characteristics of this research, a single-case study will not be appropriate.

Dismissing a single-case study approach suggests that multiple cases prove more appropriate for the research proposed in this book. Studying multiple cases makes it possible to build a logical chain of evidence (Miles and Huberman 1994). Additionally, Benbasat et al. (1987) state that a multiple-case study provides more general results than a single-case study does. The analytical conclusion derived from a multiple-case study is more robust, as it moves the investigation from one context to another, thus isolating idiosyncrasies that contribute to exploring the phenomenon (Yin 2009).

Interpretive studies use more than one case without loss of depth and rely on the richness of their descriptions to support their validity (Doolin 1996). A multiple-case study allows comparisons which can show that the research results are not idiosyncratic to a single case but are consistently replicated by several cases (Eisenhardt 1991). Constructs and relationships can be more accurately explained since it is easier to find out precise definitions and appropriate levels of construct abstraction from multiple cases (Eisenhardt and Graebner 2007).

5.4.4   Purposive Sampling

The sampling logic where a selection is made out of a population is improper in case study research (Yin 2009). Eisenhardt (1989) states that the "random selection of cases is neither necessary, nor even preferable". Theoretical sampling is appropriate which means that cases are chosen for the reason that they are mainly suitable for revealing relationships and logic among constructs. Cases are selected when they will be likely to offer findings confirmation by insight replication from other cases or offer different findings by contrary replication (Eisenhardt and Graebner 2007). Therefore, replication logic is used as a base for the multiple-case study in this research. A multiple-case study strengthens the findings through replication and increases confidence in the robustness of the results. The selection of each case is done according to literal

replication that predicts similar results for expected reasons, or theoretical replication that provides different findings for expected reasons (Yin 2009).

The cases selection was purposeful, involved in the use of replication logic and largely depended on the conceptual framework developed based on prior theory (Perry 1998). Patton (1990) lists some strategies of purposeful sampling. Of these strategies, maximum variation sampling focuses on extreme cases that are used to observe contrasting patterns in the data. This leads to clear pattern recognition of the central constructs, relationships and logic of the focal phenomenon (Eisenhardt and Graebner 2007). Other types of purposeful sampling include the "typical case". For this study, the selection of the cases was a purpose-based selection as the intention was to study a specific organisational situation with the characteristics of: being big enough to have an IAF and having implemented ERP systems within the last year at the maximum. Two are manufacturing companies and two large banks operating in Egypt, where one of each pair is international and the other is national. This was to apply the literal replication and theoretical replication suggested by Yin (2009). Therefore, purposive sampling was used as the most appropriate method when doing cases study as it satisfies the literal replication that could be typical cases and theoretical replication that could be contrasted cases.

Generally, there is no ideal number of cases that should be conducted when using multiple-case study. Romano (1989) suggested that determining the suitable number of cases should be left to the researchers. However, Eisenhardt (1989), Lincoln and Guba (1986) suggest that cases should be added to reach the theoretical saturation level or to the level of redundancy, but this neglects the constraints of time and budget.

There is no exact rule to determine the number of cases to be conducted (Perry 1998). Moreover, Patton (1990) claims that "there are no rules" for sample size in qualitative research. Irani et al. (1999) do not provide an exact number or range of cases that could serve as guidelines for researchers. They argue that the number is mainly up to the researchers' discretion and depends on the research aim and questions. Therefore, determining how many cases should be studied depends

on what is known about the phenomenon after conducting a case study and on the new information likely to come out from studying more cases. Research questions and data to be collected are at the core in determining the suitable number of cases and at what point the researchers have studied sufficient cases to enable appropriate analysis (Eisenhardt 1991). There is no single rule regarding the minimum number of cases that should be used for a multiple-case study (Eriksson and Kovalainen 2008). Eisenhardt (1991) suggests that multiple-case design requires the study of between four and ten cases. Creswell (2009) counters this suggestion and argues that a researcher should typically choose no more than four cases in order to capture the context where the phenomenon occurs in much more detail. As such, the research in this book employs the use of a multiple-case study within the limits suggested by (Eisenhardt 1989; Creswell 2009).

In this study, access to the organisations and the willingness to cooperate were gained through personal contacts. For each organisation, a main individual was identified and e-mails were sent to explain the research objectives, to highlight the importance of the research and to request participation. This is according to Lewis (2003, p. 62), who recommends having a single point of contact within the selected organisations to avoid duplications of communication. In accordance with the suggestions of Voss et al. (2002), the main individuals were senior enough to ease the access and to recommend the best interviewees who are able to provide the required data. Later on, those individuals were contacted to find out the willingness of their organisations to participate.

The multiple-case study consists of the comparative in-depth examinations of four organisations. The study uses a multiple-case study to cover the theoretical replications of the studied phenomenon across Egyptian national organisations and international organisations working in Egypt. Therefore, two individual cases within each category were conducted, so that the theoretical replication was complemented by literal replications. To assist with the comparability of data, it is decided to restrict the organisations selected to only two industries. These are in the banking and the manufacturing sectors. The first case study was used to help set the boundaries of the study.

When investigating an organisation-level phenomenon, the site selection is based on the characteristics of organisations. These may include the industry, geographic coverage and the specific technologies in which the researchers are interested (Benbasat et al. 1987). Accordingly, the sites of the cases were from the banking and manufacturing sectors. The banking sector plays an important role in the national economy, and imbalance in this sector was the main reason for the financial crisis. Moreover, the banking sector is always a subject of corporate governance rules and regulations from different institutions locally and internationally. In addition, the IAF gains a great deal of attention as a corporate governance tool in modern banks. Thus, the banking sector has been chosen for conducting the case studies. Moreover, ERP systems are widely used and are more mature in the manufacturing sector.

Geographically, there was a debate that the ERP systems are designed in the developed countries and organisations in the developing countries often face some misalignment issues between the system characteristics and the working environment. Therefore, a comparative study between the IAF in international organisations and national organisations in one of the developing countries (Egypt) increases our knowledge about this issue and our understanding of the IAF adaptation as a response to ERP systems introduction. The Egyptian context is a particularly significant and interesting setting for two reasons. First, Egypt is one of the Middle East countries where about 70% of IT spending is on ERP systems (American Chamber 2002). ERP systems, as a complex IS, face some challenges in developing countries taking into account infrastructure challenges and the specialised knowledge needed that rarely is available locally (El Sayed 2006). Second, there is a great deal of attention given to the corporate governance practice and mechanisms in Egypt. Egypt responded to the growing concern about corporate governance in recent years by reforming the Corporate Governance Egyptian Code that includes a number of rules that focus on various aspects of corporate governance, especially an internal audit department. These points make the findings of this study different from those of other case studies conducted in more advanced countries.

Finally, as the study is interested in the IAF adaptation after ERP system introduction, specifically, the cases were conducted in organisations which have implemented the ERP systems within no more than 1 year.

Using multiple cases enables validating and cross-checking of the findings. This approach treats each case as a separate test of the initial proposed conceptual framework presented in the Chap. 3. This is to achieve analytical generalisation through the replication logic rather than sampling logic where each case is comparable to a new experiment (Eisenhardt and Graebner 2007; Yin 2009). Additionally, multiple cases provide more compelling evidence than a single case and increase the robustness of the research findings (Eisenhardt 1989; Irani et al. 1999; Yin 2009).

In this study, the theoretical saturation concept was followed to limit the number of cases conducted to four. No further cases were added when the latest case conducted did not add new insights to the research inquiry compared to the early ones.

5.5   Empirical Research Process Design

Empirical research design is a cohesive and logical process that involves the collection, analysis and interpretation of research data (Yin 2009). The whole research process is divided into three main stages. The first stage is the formulation of the idea and developing the "what" question about the research. The second stage is the data collection stage and "*how*" to conduct the field study. The final stage is the analysis of the collected data and the interpretation of the "*why*" question about the phenomenon. The following subsections discuss the design and the process of the investigation that the researchers have undertaken, to collect and analyse the fieldwork data. They address the process design, data collection and data analysis methods.

The starting point was to review the relevant literature to develop the necessary understanding of the research area under investigation. As the research is classified in the AIS field, an integrative approach, based on a multi-disciplinary review of the literature in the auditing and IS disciplines, helped in developing an in-depth understanding of the

phenomenon under study. This led to a specific research area and ultimately identified a research need. The initial finding from this review was the need to bridge gaps in knowledge in terms of the IAF adaptation in response to the ERP systems introduction. Thereafter, a conceptual framework was developed to represent and focus on the intended empirical research. It was decided that the research design would apply a qualitative multi-cases study strategy. The research design was transformed into a protocol, wherein qualitative data collection methods were developed to gather data required based on defined units of analysis. The method was in the form of an interview agenda (see Appendix B), that is, a set of questions to guide the researchers during the semi-structured interviews. In addition to the interviews, data were collected through several sources like focus groups, observations and archival documents, internal reports, consultancy reports and the website of the organisations. The use of multiple-data collection methods makes data triangulation possible (Eisenhardt 1989).

5.5.1　Choosing Case Study Companies

Selecting a particular type of case study design is guided by the overall study aim. Yin (2009) classifies case studies as explanatory, exploratory or descriptive. He also differentiates between single, holistic and multiple-case studies. This research aims to explore situations where the interventions being evaluated have no clear, single set of outcomes and to explain why particular outcomes occurred. The case study analysis seeks to identify the multiple inter-linked factors that have an effect on the IAF and compares what is found in the case to theory from literature. Therefore, the most suitable type of the case study design is exploratory research (Yin 2009). Because comparisons will be drawn, it is imperative to use multiple-case study design. The examination of four cases was conducted to understand the similarities and differences between the cases. The cases were chosen carefully so that similar results within each pair of cases can be predicted (a literal replication) and contrasting results across each pair of cases (a theoretical replication) (Yin 2009). Four case studies were conducted in Egypt. Data were gathered from

two manufacturing companies and two large banks operating in Egypt, where one of each pair is an international and the other is national. These cases have been selected because of a combination of accessibility and representativeness. A multiple-case study enables the exploration of differences within and between cases. The goal is to replicate findings across cases. Overall, the evidence produced using this type of study is considered robust and reliable; however, Baxter and Jack (2008) suggest that this can be time-consuming and expensive to conduct.

The case study started without propositions as Miles and Huberman (1994) suggest that propositions are not presented in exploratory case studies where there is not enough experience, knowledge or information from the literature upon which to base propositions. However, Miles and Huberman (1994, p. 18) suggest that the conceptual framework can help in identifying who will be included in the case study, describing what relationships will be presented based on theory and gathering constructs into intellectual bins. Therefore, the conceptual framework will be referred to again at the stage of data interpretation.

It is important to consider some other components required for designing a rigorous case study. These include identifying unit(s) of analysis and the criteria for interpreting the findings (Yin 2009).

5.5.2 The Unit of Analysis

The unit of analysis is the level at which the research is conducted and which objects are researched (Blumberg et al. 2011). This research uses multiple units of analysis:

- The organisational level of analysis is used to understand the corporate governance external pressures related to the IAF. The analysis of the organisational level in the international organisations focuses only on the unit of the organisation located in Egypt, while the whole organisation is analysed in the national cases.
- The sub-organisational level is used where the IAF is the unit of analysis to understand how ERP systems affect it in the micro-level. The IAF means different things to different organisations. For the

purpose of the analysis, the IAF is given the widest meaning in terms of the claim made by the IIA that it should cover effectiveness, efficiency of operations and compliance with laws. Therefore, all practices which are undertaken to assure that control procedures are followed will be regarded as internal audit activities for the purpose of the study. The result is that the study has not taken a narrow view of the role of the internal auditor. It accepts persons who conduct surveillance to ensure that procedures that protect organisations from a physical loss that would lead to financial loss are included as internal auditors.

In order to avoid attempting to address a topic which has too many objectives for one study, some authors have suggested that placing boundaries on a case can prevent this. Suggestions on how to bind a case are by time and activity (Stake 1995) and by definition and context (Miles and Huberman 1994). In the current study, established boundaries would depend on a concise definition of the IAF and ERP systems.

5.5.3 Case Study Protocol

Despite the increasing calls for using the case study in AIS research, there are few guidelines on how to develop a case study protocol (Maimbo and Pervan 2005). A case study protocol is a set of guidelines that outlines the procedures governing the research before, during and after case research. A protocol ensures uniformity where data are collected in multiple sites (Eisenhardt 1989). Such a protocol is necessary to increase the consistency and focus of the data gathering process. When the empirical inquiry is subjective and seems to depend on irregular data gathering tools, then a scientific map must be developed so other researchers can trace the data collection path which was followed (Irani et al. 1999).

The developed case study protocol assists in detailing in advance the procedures that are followed during data collection. It provides direction to improve and emphasise the reliability of the case study research findings. According to Yin (2009), the essential components of the case

study protocol include an overview of the study, the field procedures to be followed and interview questions. During the development stage, the case study protocol is reviewed by some potential participants in order to get feedback regarding its structure, content and usability. This tactic is used to ensure that the research utilises terminology that participants are familiar with. Feedback is used to refine the case study protocol. The core of the case study protocol is the interview agenda (see Appendix A) that sets all the questions to be asked in the interviews. This allows other researchers to replicate the study and obtain similar results (Yin 2009).

5.5.4   The Role of the Researchers

The contextual complexity in studying IS in organisations and the need to interpret IS-related activities in the context of other organisational activities requires a deep understanding (Doolin 1996). According to Walsham (1995a), there are two roles for a researcher: to be an outside observer or to be an involved researcher. In this book and given the data collection methods, it could be said that the position of outside observer is adopted. Even though this position involves some distance from the interviewees, it gives them more opportunity to express their views more freely once a rapport of trust is established. Nonetheless, one of the main disadvantages of this adopted role is the difficulty in getting access to certain issues which are considered as confidential or sensitive to share with outside observers.

5.6   Data Collection

Qualitative research methods, illustrated by Walsham (1995a, b), are used to conduct the study. These include in-depth semi-structured interviews and illustrative materials. Evidence from several sources is collected to support the research results. It is a strategy which enhances data credibility (Yin 2009). The target is to obtain a rich set of data about the research issue and to capture the contextual complexity. Prior

to the main data collection, four pilot interviews were conducted to provide preliminary insights and to examine the agenda of the interview questions. The pilot informants were two academics who are specialists in the AIS field, one an ERP consultant and one a certified internal auditor. Additionally, the pilot interviews helped with refining the data collection plans. The interviewees were invited to comment and provide suggestions regarding any ambiguity on the wording of the interview questions. The questions are tried out before moving ahead with the research to find out: Do the questions extract the right information? Do they secure detail and meaning? Do they get individuals to open up? Are they well sequenced and topically ordered? As suggested by (Hermanowicz 2002), furthermore, these pilot interviews were proved to be useful in gaining feedback from practitioners prior to undertaking the main empirical study.

5.6.1 Triangulation

Triangulation when doing a case study is very important, as Yin (2009, p. 199) argues that "any case study finding or conclusion is likely to be more convincing and accurate if it is based on several different sources of information". There are several different types of triangulation, and data triangulation refers to the process of using multiple-data collection techniques within one study to check the validity of the data derived (Yin 2009). Data triangulation is to study the same phenomena at different times, with different participants and in different locations. According to Flick (2008), data triangulation helps in verifying facts through multiple-data sources. Moreover, data triangulation improves the quality of data and consequently the robustness of the findings (Myers 2009).

Data were collected from multiple sources, which are highly recommended by many researchers (Miles and Huberman 1994) as a mechanism for increasing both the reliability and validity of qualitative research. The research uses more than one source of data such as interviews, focus groups, observation and document analysis. Data triangulation through using a multiple-case study added value to the research

and its findings. Data triangulation offers the cross-validation of data obtained from different sources. Furthermore, data credibility was verified through depending on a multiple-informants design for the semi-structure interviews. This allows viewing research points from more than one perspective. Interviewing different people within an organisation aimed at the triangulation of subjects, where the idea is not to force one voice to emerge, as suggested by Myers and Newman 2007. This also helped to reduce the bias of interviewing only the prominent individuals in an organisation (Miles and Huberman 1994). The study also made use of triangulation within methods by combining two strategies of questioning within the semi-structured interview through the combination of narrative semantic questions and descriptive and argumentative questions. The research uses content analysis through bringing together strategies proposed by (Miles and Huberman 1994; Hsieh and Shannon 2005; Yin 2009; Zhang and Wildemuth 2009).

The techniques used to apply triangulation are: using a multiple-case study; multiple-informants; cases and participant sampling triangulation through purposive sampling and snowball sampling; generating data through semi-structured interviews, observation, documentation and archival record review; combination of narrative semantic questions and descriptive and argumentative questions and using combination of perspectives to conduct the content analysis. The empirical evidence is gathered using multiple-data collection methods which are outlined below.

5.6.2 Semi-structured Interviews

Given the research aim, interviews are considered to be the most useful data source for gathering the interviewees' interpretations of changes which are taking place in relation to the IAF. This study involves determining the structure and the practice of the IAF within ERP-based organisations. Therefore, interviewees were chosen to cover the stakeholders of the IAF and ERP systems. The interviewees encompass, for instance, internal and external auditors, ERP vendors and managers, consultants and IT professionals. The IAF encompasses a broad range

of activities. Usually, individual organisations would have arranged these activities for their own convenience; therefore, the activities may often be segregated within the organisation and not viewed collectively as part of the IAF. As a result, a formal questionnaire without detailed guidance would be unlikely to yield a valid result. For this reason, a detailed semi-structured interview using open-ended questions was necessary. A form of semi-structured interview is considered to be the most appropriate method by which the main body of data is gathered. The reporting media is an important concern in interviewing. Note taking complemented with tape recording where possible is a reasonable approach (Walsham 1995a).

The qualitative interview is a very effective data gathering technique. The unstructured or semi-structured interview is the most used type in qualitative research in the IS field (Myers and Newman 2007). The semi-structured interview is among the most fundamental methods and one which brings a closer understanding of people and their social worlds (Hermanowicz 2002). Regarding interpretive case studies, interviews are the most important sources of data (Walsham 1995a). The interpretive studies use less structured interviewing techniques to encourage participants to express their own views without influence from the interviewer's preconceptions (Doolin 1996). Moreover, Eriksson and Kovalainen (2008) argue that semi-structured interviews are appropriate for answering open-ended questions, especially what and how types of questions that are common in the interview agenda.

Using interviews as a data collection method reflects the ontological and epistemological stance of the researchers and serves to maintain the consistency and coherence of the research structure. From an ontological perspective, the experience, understanding and interpretations of the interviewees are the components of social reality; therefore, the proper way to understand social reality is to explore these dimensions. From an epistemological perspective, using the interviews generates data, accesses people's experience and understanding through interactive approaches that allow the flow of participants' interpretations. In this study, analysing contextual factors implies choosing interview methods that have the ability to extract comprehensively the complexity of the phenomenon.

To mitigate bias in the interviews, many highly knowledgeable informants who view the focal phenomena from different perspectives are interviewed, as suggested by Eisenhardt and Graebner (2007). Individual, in-person semi-structured interviews with individuals from different hierarchical levels such as internal auditors, CIA, IT professionals, top managers, external auditors, consultants and ERP vendors were conducted at the selected organisations, using a two-part questionnaire as a guide. The first section included questions designed to gather general information about each organisation. The second section focused on the IAF, with the purpose of exploring its corporate governance rules that govern it and the impact of the ERP system implementation on its structure and practice. Participants were not asked to fill out a questionnaire; instead, it was used as a guide to direct and structure the open-ended interviews.

Prior to the fieldwork, the interview questions were reviewed and checked by four academic and professional experts, two academic experts in internal auditing and ERP systems and the others were one from the internal audit profession and one ERP professional expert. The interview schedule (see Appendix B) provided a guide for the interviews. Probes and prompts were used to clarify or expand responses. Each interview lasted 60–90 min, and the questions were grouped into themes. This aided the logical flow when collecting and analysing the data. Prior to the interviews, participants were notified of the aim and the general objectives of the study. In the beginning of the interview, the purpose of the interview and what was expected to be achieved were clearly explained and interviewees were reassured that no attribution would be given to their views in any subsequent discussion or reports. The interviews were steered carefully to the purpose of the study, while avoiding over-directing the interviewee. Interviews were usually conducted in the interviewee's office, which facilitated the access to the relevant documents if the interviewee needed to check details or share related materials. Five of the participants from different cases preferred to have the interviews in a café as sit provided an informal and relaxed setting. All the interviewees spoke English, but some felt more comfortable answering in a mixture of Arabic and English.

The interviewees were asked for permission to call back to check any further matters and for giving feedback, as recommended by Myers and Newman (2007). As suggested by Hermanowicz (2002), the interviews were recorded and subsequently transcribed. This made it possible to listen to the interviews many times and extract direct quotations to support arguments. Three participants did not agree to being recorded, and in these cases, an effort was made to ensure making a complete set of notes.

Follow-up interviews were conducted using a combination of face-to-face and telephone interviews. Particular effort was made to interview individuals originally involved in the ERP system implementation as well as those persons managing its maintenance.

5.6.2.1 Purposive Sampling for Participants

The purposive sampling technique is highly recommended for qualitative case study research (Neuman 2003). It has been used to identify key participants. The purposive sample consists of selected individuals who have particular features or characteristics that enable a detailed understanding of the phenomena understudy. Interviews were the main data sources; therefore, selecting the interviewees and justifying this selection were critical steps and were an integral part of the case study protocol. Because the unit of analysis was the IAF, the focal participants were individuals involved in the function and its contextual factors, ERP systems and the governance pressures.

5.6.2.2 Snowball Sampling

This study combines purposive sampling with snowball sampling. Snowball sampling "is commonly used when it is difficult to identify members of the desired population" (Saunders et al. 2009, p. 147). The snowball sampling technique was employed in order to gain access to further participants. Initially, the data were accessed through purposive sampling and selection of the key participants. Gradually, further participants were accessed through key participants recommending

other participants who might be willing to participate and met the criteria of the research objectives. In turn, these new participants were asked to recommend others who could enrich the investigation and provide important data. Within each organisation, the data saturation criterion was followed to decide when enough participants had been interviewed and data were gathered to the point that nothing new was being added.

5.6.3 Focus Groups

Focus group is a form of group interview that explicitly utilises the interaction between research participants as part of the method to generate data (Kitzinger 1995). It is useful to explore how participants describe their thoughts and to uncover important factors (Kitzinger 1995). Focus groups encouraged participation from people reluctant to be interviewed on their own also encourage the participation of those who are anxious about talking. To establish the right atmosphere, focus groups were in a comfortable setting with group size between four and six people. The researchers started by explaining the aim of focus groups. Participants were encouraged to talk to each other and comment on others' experiences and points of view. The focus groups naturally occurred from people work together. Only three focus groups were conducted, two of them were conducted with the IT team within organisations, and the third was conducted with external IT auditors.

It was important to consider the hierarchy within the group not to affect the data. An advantage of having a focus group of colleagues in the same department was that they related each other's comments to incidents in their shared tasks. These groups ensure discussion among participants sharing same ideas in order to reduce the risk of clashing ideas. They challenged each other on contradictions between what they express to believe and how they actually behave. The researchers urged debate to continue and encouraged the group to discuss further the inconsistencies. Disagreements within groups used to encourage participants to clarify their point of view. Each group discussion session lasted between an hour and an hour and half. Discussions were tape-recorded

and transcribed. Focus groups analysis was conducted using the same method as other qualitative data.

5.6.4 Documentary Evidence

Documents are useful for making inferences about events. Yin (2009, p. 103) states that "because of their overall value, documents play an explicit role in any data collection in doing case studies. Systematic searches for relevant documents are important in any data collection plan". Collecting documents is regarded as an important means of data collection in qualitative studies. There were many types of document which were found to be helpful and interesting for this study and which added value to its data collection phase. The documents reviewed include published interviews with key informants, newspaper and journal articles and written reports of events. Some sorts of documentary evidence related to the ERP systems and the IAF within each organisation were collected and analysed. These included:

- Corporate governance rules and regulations relating to the IAF structure and practice.
- The Basel Committee standards relating to internal control and risk management in banks.
- Internal audit reports, consultant reports and documents from the ERP vendor which clarify the auditing tools included in the system.
- annual accounts and external audit reports.
- Job descriptions of the internal audit and the brochures of the IT department, risk management department and organisation' and other internal documentation that was needed to provide background information about the organisation.
- Data from the organisation's website, press releases and other public sources of information (used to corroborate the evidence from other sources).
- Selected materials from training and workshop sessions provided by the ERP system vendors.

These materials helped develop a rich knowledge about the phenomenon under study.

5.6.5 Observation

In addition to the interviews and documentary evidence, data were gathered through the observation of a number of internal auditors in their interaction with ERP systems. In some cases, internal auditors can demonstrate practically how they can tell whether there is something wrong with the system, what they are getting out of the system and explaining how the output of their work differs from, or is similar to, the systems that were in place prior to the ERP systems.

Observation is used as a method to collect data, motivated by the need study the working environment, the communication between partners and the means of interaction. The researchers visited the organisations equipped with a notebook and recorder, to describe accurately the working environment. Observation was unstructured as suggested by Bryman and Bell (2007). The observation was found to be a useful means of collecting data. For example, in the national bank, the researchers noted that the risk management department was located in a different building than the IAF, while they are located in the same floor in the international bank. This suggests that there was more interaction and collaboration work between those departments at the international bank than at the national bank. Additionally, at the international company, the researchers took notes of some posters in the internal audit department highlighting for the team the importance of integration in working on and in accomplishing any audit task. Eventually, observation technique was applied to maximise the triangulation in this study, which resulted in enriching the collected data and enhancing the research reliability and validity. In addition, some informal conversations were conducted as opportunities came along. This technique is useful for providing extra information about the area being studied.

5.7   Data Analysis

One drawback to using qualitative data is that the methods of analysis are often not well formulated (Miles and Huberman 1994) and most methods depend on the researchers' skills to observe themes within data (Oates 2006). According to Rowley (2002) the principles for analysing data from multiple-case studies are to:

- make use of all related evidence
- consider all the major rival interpretations
- Address the most significant aspects of the case study in the analysis, drawing on prior knowledge in the area of the case study but in an unbiased manner.

A review of the various methods of analysis was conducted to determine an appropriate technique. To structure the complex task of analysing the significant amount of qualitative data, a process of qualitative analysis is used utilising guidelines of the qualitative content analysis (Miles and Huberman 1994; Yin 2009; Zhang and Wildemuth 2009). Based on these recommendations, this study has built a plan of analysis and data processing practice. The process applied in this research first uses Miles and Huberman's (1994) ideas as a general strategy as analysing qualitative data consists of "data reduction, data display and conclusion drawing" (p. 10), combined with Yin's (2009) advice in analysing the case study and the detailed steps of qualitative content analysis suggested by Zhang and Wildemuth (2009).

5.7.1   Qualitative Content Analysis

In this study, the qualitative content analysis technique was followed in order to understand the nature of the phenomenon understudy and interpret the themes of the participants. This technique is deemed the desirable one for this study as it helps to preserve the deep meaning of the qualitative data. Furthermore, it enables the interpretation of all

transcribed interviews, documents and observations to gain a holistic view of the phenomenon.

Content analysis has been defined as a systematic, replicable technique for compressing many words of text into fewer content categories based on obvious rules of coding (Weber 1990; Krippendorff 2004). Content analysis is a widely used qualitative technique (Hsieh and Shannon 2005). Content analysis is used to interpret meaning from the content of text data. Qualitative content analysis has been defined as "any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings" (Patton 2002, p. 453). Qualitative content analysis extracts objective content from text data to examine themes which are manifest or latent. This type of analysis allows researchers to understand social reality in a subjective but scientific manner (Zhang and Wildemuth 2009).

Qualitative content analysis uses inductive reasoning, by which themes and categories emerge from the data (Zhang and Wildemuth 2009); however, qualitative content analysis does not need to exclude deductive reasoning (Patton 2002). Hsieh and Shannon (2005) discuss three approaches to qualitative content analysis, based on the extent of inductive reasoning used. The approach followed in this study was directed content analysis, in which initial coding starts with a theory and relevant research findings. Then, during data analysis, researcher is immersed in the data and allows new codes to emerge from the data. This method is used because the purpose of this approach usually is to validate a conceptual framework (Hsieh and Shannon 2005). This approach helps to guide the analysis and interpretation with certain expectations, while allowing aspects to emerge from the empirical data, which differ from what is in the conceptual framework.

5.7.1.1   Prepare the Data

In the analysis process, data gathered from multiple sources were brought together rather than handled separately. Each data source contributed to a greater understanding of the entire phenomenon and

strengthened the findings. In order to start data analysis, all materials were prepared for analysis by being in the same format. The data were transformed into written text before analysis started. Audio tapes of the recorded interviews were transcribed. Complete transcripts were prepared where all the answers to the questions from the interview guide were literally transcribed in verbalisations. The translation process from Arabic to English language was included in the transcribing process. Most of the raw data are irreplaceable, so a copy of all the data was made. Since data analysis is done with the aid of a computer, backups of analysis work were made, as suggested by Oates (2006).

To help filling and sifting the material, within-case analysis starts off by readying all data to get a general impression and to identify key themes in the data. Initially, three themes were used (Oates 2006):

- Sections have no relations to the research purpose so are not needed.
- Sections provide general information that is needed to describe the research context (for example, history of the organisation, number of employees, location and time respondents have spent in their current job).
- Sections relevant to the research questions. Each unit of data on this third type is to be coded and categorised.

5.7.1.2 Define the Coding Unit

Defining the coding unit is one of the most fundamental and important decisions in the qualitative content analysis (Weber 1990). The coding unit of analysis means the basic unit of text to be classified during content analysis (Zhang and Wildemuth 2009). This study has used individual themes as the coding unit of analysis to do qualitative content analysis, rather than the word, the sentence or the paragraph which are mostly used in quantitative content analysis. A theme could be expressed in a single word, a phrase, a sentence, a paragraph or an entire document. Therefore, a code can be assigned to a text chunk of any size, as long as that chunk represents a single theme or issue of relevance to the research questions.

5.7.1.3 Develop Categories and a Coding Scheme

To use the reduction analytical technique, which helps in developing a clearer picture of participants' responses (Miles and Huberman 1994), a list of data codes was established based on the conceptual framework and modified during the analysis. The data reduction is "the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcriptions" (Miles and Huberman 1994, p. 10). This step started during the data collection, transcription and coding stages. The qualitative content analysis technique was particularly rich and meaningful because of reliance on coding and categorising of the data. Weber (1990, p. 37) stated that "A category is a group of words with similar meaning or connotations". With the directed content analysis approach, analysis started with the conceptual framework based on the theory or relevant research findings as guidance for initial codes (Hsieh and Shannon 2005).

It has been suggested (Rowley 2002) that in exploratory study it is good practice to develop a framework as an analytical strategy for organising the case study. A framework was developed for each section to reflect the themes. Evidence was gathered within relevant themes, analysed and compared in these categories. This was done to get a description that can be corroborated from multiple sources of evidence (Rowley 2002). The coding scheme and categories were based initially on the conceptual framework themes and sub-themes. This approach was indeed helpful for the data reduction stage. It directed the efforts of the analysis towards the research questions and objectives. Data were coded based on the conceptual framework because "conceptual frameworks and research questions are the best defence against overload" (Miles and Huberman 1994, p. 55). An initial list of coding categories was generated from the framework and modified within the course of the analysis as new categories emerge inductively (Miles and Huberman 1994). Qualitative content analysis allowed assigning a unit of text to more than one category simultaneously (Zhang and Wildemuth 2009). The categories in the coding scheme were defined in a way that they are

as internally homogeneous as possible and as externally heterogeneous as possible (Lincoln and Guba 1994).

This technique of the conceptual thematic analysis was facilitated by the existence of the conceptual framework that encapsulated the predefined themes generated from the literature review. A new set of themes were revealed through iterative recoding and analysis. This fulfilled the task of data reduction through having a clear research design as a means to analyse qualitative data. This is an appropriate strategy as Yin (2009, p. 36) states that "the complete research design will provide surprisingly strong guidance in determining what data to collect and the strategies for analysing the data is an essential step when doing case studies". The detailed coding scheme can be found in Appendix C.

5.7.1.4 Test the Coding Scheme on a Sample

To use a standardised process in analysis, the coding scheme was developed and validated at the early stage of the analysis process. To test of the clarity and consistency of category definitions, a sample of data was coded (Zhang and Wildemuth 2009). The coding consistency was checked through an assessment of inter-coder agreement. Coding sample text, checking coding consistency and revising coding rules are iterative processes that continue until sufficient coding consistency is achieved (Weber 1990).

5.7.1.5 Code All the Data

When sufficient consistency has been achieved, the coding rules were applied to the entire texts. During the coding process, the coding was checked repeatedly. New themes and concepts were revealed and added to the coding scheme.

5.7.1.6 Assess Coding Consistency

After coding the entire data set, the consistency of coding was rechecked as new codes had been added since the original consistency check.

5.7.1.7 Draw Conclusion from the Coded Data

This step involved making sense of the themes or categories identified and their properties. Meanings derived from the data were inferred and reconstructed. Properties and dimensions of all categories were explored to identify relationships between categories. Theoretical replication was the key to the rigorous analysis of the case study data (Perrys 1998). Within-case analysis precedes cross-case analysis (Miles and Huberman 1994). Within-case analysis is descriptions; however, it is essential to build up familiarity with case data as stand-alone. A diagrammatic display of information about each case was used. Yin (2009) has offered some strategies for analysing case data. One is to analyse the evidence based on developing a case description and cross-case synthesis techniques.

5.7.2 Within- and Cross-Case Analysis

Within-case analysis is the analysis of each individual case with a comparison with the research's frame of reference, while the cross-case analysis is to find similarities and strengthen understanding through such cross-case comparisons (Yin 2009; Miles and Huberman 1994). A case summary is a single document created for each case to collate all participants' individual responses to each question to facilitate comparative analysis. This summary facilitated the production of case reports. Therefore, transcripts and response summaries were useful for within-case analyses and case reports for cross-case analyses, respectively.

Cross-case analysis allowed each case's unique result to appear before generalising across cases. Additionally, the rich familiarity of the researchers with the data of each case accelerated cross-case comparison (Eisenhardt 1989). Eisenhardt (1989) has suggested three strategies for cross-case analysis: the first one which was applied is to choose dimensions and then look for within-group similarities coupled with inter-group differences. Dimensions were suggested by the conceptual framework which was built based on existing literature.

Data analysis across cases verified that findings are not just the result of idiosyncrasies of the research setting. Cross-case comparison represents an approach to cross-case analysis. Across cases comparison depended on relating changeability in context to constancy in process and outcomes using the logic of literal and theoretical replication (Yin 2009). Literal replication expects a second case, which has a similar context, to give similar findings for process and outcome. Theoretical replication compares cases which are different in context, expecting to find different outcomes (Cavaye 1996). The research design was a multidimensional blend of theoretical and literal replication as suggested by Perry (1998).

5.7.3 The Role of Theory

The incentive to use theory in the early steps of interpretive case studies was to formulate an initial conceptual framework. This framework takes account of previous knowledge and forms a rational theoretical basis to inform the empirical work (Walsham 1995a). The study uses institutional theory to study the IAF adaptation as a response to the technological influences after implementing ERP systems. The manner in which organisations respond to these changes is often dependent on the corporate governance rules. The study investigated how the changes in the IAF give it acceptance and legitimacy as an effective corporate governance tool. Institutional theory's relevance is in understanding the impact of internal and external influences on organisations that are engaged in IT-induced change (Weerakkody et al. 2009). Few have focused on using institutional theory to investigate the impact of IT-enabled change in IAF. Weerakkody et al. (2009) found that institutional theory has been used to study IS implementation across different contexts. The theory offers a good conceptual basis for studying transformational change in new environments.

According to Creswell (2009), who organises qualitative research approaches along a continuum on the basis of how theory is used in them, case studies are in the middle of the continuum. The case study used in this research relies on institutional theory to interpret the

findings. Theory has an essential role in the case study design and the data analysis (Perry 1998). The research used a multiple-case study to find whether the empirical evidence confirms the conceptual framework, which is built upon institutional theory, and whether the findings call for modifications to the framework (Oates 2006). This procedure does not mean simply imposing theory when analysing the data instead of generating original categories; it offers ideas and helps to produce a preliminary theoretical framework that should be considered as a "sensitising device" (Klein and Myers 1999, p. 75), which could be modified in accordance with the findings.

5.7.4 Use of NVivo

Following the pilot interviews that were carried out to test the interview agenda and to gain a feel for the important issues, the data were manually analysed and at the end of this process it was decided that it would be necessary to use a software package for the full study. The decision to use NVivo was initially made on the basis of huge volume of data. The possible alternative options were explored by attending two-day courses about the different packages before the decision was made to use NVivo. It was chosen mainly because it was new and it had therefore addressed some of the earlier problems of other packages. The time required to become familiar with the package was an important part of this decision. NVivo is user-friendly and relatively simple to use.

There has been discussion about the usefulness of using computer software in qualitative data analysis (Miles and Huberman 1994; Creswell 2009). Many qualitative researchers suggest the use of software such as NVivo to carry out a thorough, transparent and more reliable qualitative data analysis to add rigour to qualitative research (e.g. Myers 2009). Using a computerised database helps to manage large amounts of data (Baxter and Jack 2008). Using a database improved the reliability of the case study findings.

Flick (2009) identifies three main benefits for using computer software for analysing qualitative data. These benefits are speed, increase of research quality and improvement of data representation. Qualitative

data analysis software enables the researchers to handle, manage and search data in a shorter time in comparison with a manual process. It allows the researchers to be consistent in the analytical procedures which improve the validity of the research. Moreover, it enables the researchers to display the data in graphical format which facilitates better interpretation and discussion from different perspectives.

In this study, NVivo enabled independent inspection and enabled organising data sources for easy retrieval later on. It was used to provide bins into which data can be organised. This programme facilitated the recording of source detail, time and date of the data collection and provides storage and search capabilities. Documents were directly imported and coded easily on screen. It added to the analysis process transparency than would be the case using manual methods, and hence, data were interpreted more confidently. Additionally, NVivo facilitated writing memos about different aspects of documents and linking them to relevant pieces of text in different documents. NVivo was used to help analyse qualitative data through providing facilities such as: text search, easy coding, data organisation, writing tools, visual displays and exporting. NVivo does not do any analysis automatically, but it does help the researchers to find links between data. It was used mainly as an organising tool. It was used for administrative tasks of organising the data efficiently and was exploited to the full on this basis.

5.7.5 Criteria for Findings Trustworthiness

Some have tried to use the same criteria as for positivist research which include objectivity, reliability, internal validity and external validity (e.g. Yin 2009); however, they are not appropriate for interpretive research (Lincoln and Guba 1986; Díaz Andrade 2009). Thus, different criteria are needed for interpretive research (Morse et al. 2002). Unfortunately, there is not an agreed set of criteria for interpretive research. Guba and Lincoln (1994) propose a set of criteria for interpretive research which include trustworthiness (validity), confirmability (objectivity), dependability (reliability), credibility (internal validity) and transferability (external validity). Morse (1999) suggests that it is a "*myth*" to claim that validity is not

relevant criteria to qualitative research. Regardless of the naming debate, trustworthiness in the current study stems from establishing specific techniques and practice as explained in the following subsections:

5.7.5.1 Credibility

Credibility of qualitative research parallels validity in quantitative research. It means the extent of accuracy of results, matching reality and measuring it correctly (Guba and Lincoln 1994). To ensure the credibility of the research, a number of techniques were adopted.

All efforts were made to have a well-designed research that examines the right things and collect the right data from the right source, to increase creditability. Prior to the fieldwork, the interview questions were reviewed and checked by four academic and professional experts in the IAF and ERP systems field, two academics and the others were one from the internal audit profession and one ERP expert. Moreover, the research depended on qualitative data that is helpful for understanding relationships and the reasons underlying a relationship by offering an explanation of what happens. This is essential to the research validity (Eisenhardt 1989).

The researchers spent approximately three months in the work settings of the four organisations in order to become familiar with the people participating in the research and to be able to observe their everyday routines and any unusual events. This prolonged engagement allowed the researchers to develop an in-depth and comprehensive understanding (Morse et al. 2002) of the implications of ERP systems implementation for the IAF.

Some key verbatim quotations expressed by some participants are presented in supporting the arguments in each case report. Presenting some raw data collected from the fieldwork "allows the reader to get a better picture of the respondents' own concepts and categories, without relying solely on the interpretation of the researcher" (Lee and Lings 2008, p. 237).

As another way to increase credibility, this research takes into account the research participants' comments. Bryman and Bell (2007) suggest

that members' validation is a supportive tool to confirm the collected data before moving further in the project. This technique gave the ability to refine, clarify and expand the understanding of the collected data. In this research, this technique was applied after each interview through summarising the main points mentioned by the participant for final confirmation. Moreover, the initial draft of each case study report was e-mailed to some key participants in order to verify for accuracy and getting further feedback and clarification where necessary. As Yin (2009, p. 183) highlights that the review of the draft of the case study report "produces further evidence, as informants and participants may remember new materials that they had forgotten during the initial data collection period".

One more technique to increase the research credibility is the use of the triangulation as explained in Sect. 4.6.1. This allows the researchers to view a particular point in research from more than one perspective. Furthermore, credibility was verified through depending on a multiple-informants design for the semi-structured interviews. This allows viewing research points from more than one perspective (Morse et al. 2002).

To increase the credibility of the results, the research presents the theoretical reasons for the existing relationships. The research ensures that the subject of the inquiry is accurately identified and described. The researchers looked for any cause–effect relationship that can offer a reasonable explanation of the phenomenon under study. This added to the credibility of the analysis and findings (Guba and Lincoln 1994).

The peer debriefing process is to involve colleagues in the research as external reviewers (Lincoln and Guba 1986). In this research, data sharing with colleagues was another technique used by the researchers to gain alternative perspectives from others. Peer debriefing helps in broadening the interpretation of the data and in overcoming biased explanations by challenging the primary assumptions by a qualified peer.

5.7.5.2 Generalisability

Generalisation is "concerned with the application of research results to cases or situations beyond those examined in the study" (Collis and

Hussey 2009, p. 59). This could be a criticism which is directed to the statistical and not to the analytical generalisation that is the basis of case studies. Often it is suggested that case results cannot be statistically generalised (Yin 2009). No statistical support exists that enables the results to be projected outside the studied cases; however, case studies depend on an analytical generalisation (Yin 2009). Interpretive research does not seek statistical generalisation. Instead, it seeks a deeper understanding of the phenomenon, which can then be used later on to inform other settings (Orlikowski and Baroudi 1991). From an interpretive position, the validity of doing so relies on the plausibility of the logical reasoning used in describing the findings and in drawing a conclusion from them (Walsham 1993).

In this study, generalisation is not statistical but analytical in which an established theory is used as a model to compare the empirical results of the case study with it. Generalisation of the cases' results is important so that it contributes to the theory based on replication logic (Rowley 2002). This study uses replication logic by testing the results through a multiple-case study. In this study, the researchers adopted the replication logic to replicate the initial case, carrying out further investigation in an area suggested by the first study, or complementing the first study by focusing on an area not originally covered. This process is often referred to as analytical or theoretical generalisation (Yin 2009).

Four other types of generalisation from interpretive case studies are suggested by Walsham (1995a): the development of concepts, the generation of theory, the drawing of specific implications and the contribution of rich insight. This study offers a conceptual framework which is a theory presented via a diagrammatic model. In this research, the transferability can be seen as a basis for further research using the same theory or framework. This study offers some implications as suggestions about what might happen in other similar situations with some recommendations for action. The research included the temporal and spatial dimensions of the phenomenon in the analysis to facilitate theoretical generalisations (Walsham 1995b).

Although each case is unique in some aspects, it could still be an example of broader classes of things so that a degree of generalisation is still possible. Sufficiently detailed descriptions are provided so that a

judgement can be made on whether other situations have similar features so that the findings could be relevant there too (Lincoln and Guba 1994). This research develops thick descriptions for the cases and therefore facilitates matching them with other circumstances (Bryman and Bell 2007).

5.7.5.3 Confirmability

In positivist research, it means being free of researchers' bias (Lincoln and Guba 1994). However, interpretive researchers interact with participants; therefore, they probably have some influence on them. It is a problematic issue and a source of criticism in using the case study method because of potential researcher subjectivity. Therefore, it is important to reduce subjectivity by linking data collection questions to research questions (Rowley 2002).

Three solutions to counteract this have been proposed by Yin (2009) and used by the researchers: using various sources of data, establishing a string of evidence as discussed in Sect. 4.6 and having a draft of the case study report to be reviewed by key interviewees. Moreover, to achieve confirmability multiple-data sources, methods and informants checking the correctness of descriptions and interpretations have been used (Doolin 1996; Lincoln and Guba 1994). Furthermore, the research tells enough to judge whether the findings do flow from the data in the setting (Lincoln and Guba 1994). Presenting the chain of evidence contributes to the trustworthiness of the analysis. Through the trustworthiness procedures, the research offers a rigorous flow to enable auditors and any external inspection to track the development of the idea through a chain of evidence (Yin 2009).

5.7.5.4 Dependability

In positivist research, it means whether the study can be replicated with similar results (Lincoln and Guba 1994). It means to demonstrate that the research instruments are accurate and reliable (Oates 2006). This is achieved through documentation of procedures (Rowley 2002). The

research process is well recorded and the data documented. One of the most important methods used is the development of a case study protocol and developing a case study database (Yin 2009). From an interpretive view, the purpose in doing so is not to guarantee that a repetition of the research will draw exactly the same conclusion; the same data can be used and offer a dissimilar interpretation. Rather than presenting a completely different picture, it might discover a different angle to the phenomenon under study (Díaz 2009).

In this study, to enhance the dependability of the research: a case study protocol is used to ensure following standard process in all cases. Recorded data were transcribed in full to ensure as much accuracy as possible in terms of interpretation. A structured case study database is created to store empirical data from all the interviews and documents to ensure that the fieldwork data were collected and stored in a systematic and logically ordered manner. Complete records for the process of data collection and analysis are accessible and available in digital format for any further review.

5.8   Ethical Considerations

Ethical issues are critically important in social research in general and in qualitative research in particular (Tilley and Woodthorpe 2011; Myers 2009). Unlike other social researchers, the relationships between management researchers and participants are characterised by a power imbalance (Bell and Bryman 2007). Senior managers have the ability to wield power by defining access boundaries and setting expectations regarding the research output. However, the researchers were in a weaker bargaining position; he secured consent and used this power in the research favour by convincing the top managers with the importance of the research and the needed access to get findings that may benefit their companies. Companies asked the researchers to sign confidentiality agreements restricting what information can be disclosed about them.

Like other social researchers, management researchers face pressure to protect the confidentiality and anonymity of participants' and

companies' identity to avoid harmful effects (Tilley and Woodthorpe 2011; Bell and Bryman 2007). Confidentiality means the protection of information supplied by research participants from other parties, while anonymity involves the protection of the identity of an individual or company by concealing their names or other identifying information. Therefore, the researchers protected these identities by using pseudonyms and removing information leading to identification of the individuals or companies described in the study. All the participants were notified and assured that their inputs and feedback would be used only for research and it would be kept strictly confidential. This approach enabled the participants to be open and frank about sharing their personal beliefs and experiences.

As explained in detail in the case study protocol and interview agenda (see Appendix A and B), many procedures and practice worked as guidelines to the interview processes before, during and after the interview. For instance, as an introductory for each interview, participants were provided with information about the interview's general purpose and duration. To ensure the standardisation and clarity of the message delivered to all participants, the same statement was used to explain as fully as possible what the participants would be asked about, the aim of the research, who is undertaking it, the possible contributions and finally how and where its results would be disseminated.

Participants were informed that participation is not compulsory so they can refuse to continue whenever they want. This was stated in alliance with the code of ethics in the conduct of research with human participants, by "informing participants about the nature of the study, and respecting their freedom to decline to participate in or withdraw from the research in any time" (Krathwohl 1997, p. 212). Moreover, Payne and Payne (2004, p. 68) highlight that participants should "be enabled freely to give their informed consent to participate, and advised that they can terminate their involvement for any reason, at any time".

To ensure privacy and confidentiality, the participants were informed that the tape recording will be destroyed after they check and review their transcripts. Moreover, the researchers were aware of the ethical considerations during the analysis of the data obtained. This awareness can be seen in the obvious attempt to maintain the objectivity of the

research by considering all the generated data and not being selective during this stage.

In order to facilitate the access to the organisations, confidentiality approvals were sought and obtained from the university authority as a form of assurance to the organisations and individuals involved of absolute anonymity and confidentiality as well as judicious use and control of the data obtained. During the data collection process, an informed consent form (see appendix A) was handed to all participants and requested their signatures showing their participation to be voluntary.

In sum, it was important to maintain ethical standards of interviewing. These involve: obtaining ethics approval from the relevant ethics committee and permission from interviewees; treating interviewees with respect to their time, position and knowledge; keeping records and transcripts confidential and secure and providing feedback to subjects and organisations as recommended by Myers and Newman (2007).

5.9 Conclusion

This chapter has explained the research design and the methods used in the book. The researchers explicitly articulated the nature of the research problem and determined the ontological stance which led to the epistemological and methodological stances. The study is designed under an interpretive paradigm, which took the form of a multiple-case study and the analysis of a considerable amount of primary and secondary qualitative data. This enabled the researchers to interact closely with the participants and to explore issues in depth. Researchers should be aware that qualitative methodology is more applicable to develop an in-depth understanding of contextual-related problems. Qualitative design is more sensitive to context and flexible to embracing emerging new themes.

The richness of data produced through using multiple-case studies helped better to investigate the phenomenon of the IAF adaptation as a response to the ERP systems implementation. The use of case studies provided greater internal and external validity than other quantitative methods would have done. Triangulation of methods was achieved

through the use of semi-structured interviews, focus groups and non-participant observation. The qualitative content analysis was found to be the appropriate technique for analysing the data. A qualitative content analysis technique was deemed more desirable for this study as it preserves as much as possible the deep meaning of the qualitative data. Furthermore, it enabled the interpretation of all transcribed interviews, documents and notes of observation and relating each one to the whole in order to gain a holistic picture of the phenomenon. The trustworthiness strategies which were used in this research and the related procedures and techniques were found to be interlinked that fostered the coherence and validity of the research.

References

Al-Twaijry, A., Brierley, J., & Gwilliam, D. (2003). The development of internal audit in Saudi Arabia: An institutional theory perspective. *Critical Perspectives on Accounting, 14,* 507–531.

American Chamber. (2002). Information technology in Egypt. *American Chamber of Commerce in Egypt*, Cairo.

Arena, M., & Azzone, G. (2009). Identifying organizational drivers of internal audit effectiveness. *International Journal of Auditing, 13,* 43–60.

Avital, M. (2000). Dealing with time in social inquiry: A tension between method and lived experience. *Organization Science, 11,* 665–673.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report, 13*(4), 544–559.

Bell, E., & Bryman, A. (2007) 'The ethics of management research: An exploratory.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly*, 396–386.

Berg, B. (2009). *Qualitative research methods for the social sciences*. London: Allyn and Bacon.

Blumberg, B., Cooper, D., & Schindler, P. (2011). *Business research methods*. London: McGraw-Hill.

Bryman, A. (1988). *Quantity and quality in social research*. London: Sage.

Bryman, A. (2004). *Social research methods*. Oxford: Oxford University Press.

Bryman, A., & Bell, E. (2007). *Business research methods*. Oxford: Oxford University Press.

Burrell, G., & Morgan, G. (1982). *Sociological paradigms and organisational analysis*. London: Heinemann.

Caglio, A. (2003). Enterprise resource planning systems and accountants: Towards hybridization? *European Accounting Review, 13*(1), 123–153.

Cavaye, A. L. M. (1996). Case study research: A multi-faceted research approach for IS. *Information Systems Journal, 6*(3), 227–242.

Collis, J., & Hussey, R. (2009). *Business research: A practical guide for undergraduate and post graduate students*. Houndmills: Palgrave Macmillan.

Creswell, J. (2009). *Qualitative inquiry and research design. Choosing among five approaches*. Thousand Oaks: Sage Publications.

Denzin, N. K., & Lincoln, Y. S. (1998). *Strategies of qualitative inquiry*. Thousand Oaks: Sage.

Díaz Andrade, A. (2009). Interpretive research aiming at theory building: Adopting and adapting the case study design. *The Qualitative Report, 14*(1), 42–60.

Doolin, B. (1996). Alternative views of case research in information systems. *Australian Journal of Information Systems, 3,* 21–29.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

Eisenhardt, K. M. (1991). Better stories and better constructs: the case for rigor and comparative logic. *The Academy of Management Review, 16,* 620–627.

Eisenhardt, K. M., & Graebner, M. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25–32.

El Sayed, H. (2006). ERPs and accountants' expertise: The construction of relevance. *Journal of Enterprise Information Management, 19*(1), 83–96.

Eriksson, P., & Kovalainen A. (2008). *Qualitative methods in business research*. London: Sage.

Flick, U. (2008). *Managing quality in qualitative research*. Sage Publications Ltd.

Flick, W. (2009). *An introduction to qualitative research*. London: Sage Publications.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). Thousand Oaks: Calif: Sage.

Guba, E. G., & Lincoln, Y. S. (1998). Competing paradigms in qualitative research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 195–220). London: Sage.

Henn, M., Weinstein, M., & Foard, N. (2006). *A short introduction to social research*. London: Sage.

Hermanowicz, J. C. (2002). The great interview: 25 strategies for studying people in bed. *Qualitative Sociology, 25*(4), 479–499.

Hessler, R. M. (1992). *Social research methods*. New York: West Publishing Company.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277–1288.

Humphrey, C. (2001). Paper prophets and the continuing case for thinking differently about accounting research. *British Accounting Review, 33*(1), 91–103.

Irani, Z., Ezingeard, J., Grieve, R., & Race, P. (1999). A case study strategy as part of an information systems research methodology: A critique. *The International Journal of Computer Applications in Technology, 12*(2), 190–198.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26.

Kaplan, B., & Maxwell, J. A. (1994). *Qualitative research methods for evaluating computer information systems' in evaluating health care information systems: Methods and applications*. Thousand Oaks: SAGE Publications.

Kitzinger, J. (1995). Qualitative research: Introducing focus groups. *BMJ, 29*(311), 299–302.

Klein, H. K., & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly, 23*(1), 67–94.

Krathwohl, D. (1997). *Methods of educational and social science research: An integrated approach* (2nd ed.). Addison Wesley Longman. ISBN: 0-8013-2029-1.

Krippendorff, K. H. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Thousand Oaks, California: Sage Publications.

Kuhn, J., & Sutton, S. (2010). Continuous auditing in ERP system environments: The current state and future directions. *Journal of Information Systems, 24*(1), 91–112.

Lee, N., & Lings, I. (2008). *Doing business research: A guide to theory and practice*. London: Sage Publications.

Lewis, J. (2003). Design issues. In J. Ritchie & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 47–76). London: Sage Publications.

Lincoln, Y., & Guba, E. (1994). *Naturalistic inquiry*. London: Sage Publications.

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. In D. D.Williams (Ed.), *Naturalistic evaluation* (pp. 73–84). New Directions for Program Evaluation, 30. San Francisco, CA: Jossey-Bass.

Maimbo, H., & Pervan, G. (2005). Designing a case study protocol for application in IS research. *Proceedings of the 9th Pacific Asia Conference on Information Systems*, Bangkok, Thailand, July 10–13.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. London: Sage Publications.

Morse, J. (1999). Myth #93: Reliability and validity are not relevant to qualitative inquiry. *Qualitative Health Research, 9*(6), 717–718.

Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods, 1*(2), 1–19.

Myers, D. M., & Avison, D. (2002). *Qualitative research in information systems*. Sage.

Myers, M. (2009). *Qualitative research in business and management*. London: Sage Publications.

Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and Organization, 17,* 2–26.

Neuman, W. (2003). *Social research methods: Qualitative and quantitative approaches*. London: Pearson Education.

Oates, B. J. (2006). *Researching information systems and computing*. London: Sage.

Orlikowski, W. J. (1991). Integrated information environment or matrix of control? The contradictory implications of information technology. *Accounting, Management and Information Technologies, 1*(1), 9–42.

Orlikowski, W. J. (2009). The sociomateriality of organisational life: Considering technology in management research. *Cambridge Journal of Economics, 34,* 125–141.

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research, 2*(1), 1–28.

Orlikowski, W. J., & Yates, J. (2006). ICT and organizational change: A commentary. *Journal of Applied Behavioral Science, 42,* 127.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.

Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oak: Sage Publications.

Payne, G., & Payne, J. (2004). *Key concepts in social research*. London: Sage Publications.

Perry, C. (1998). Processes of a case study methodology for postgraduate research in marketing. *European Journal of Marketing, 32*(9/10), 785–802.

Pettigrew, A., Woodman, R., & Cameron, K. (2001). Studying organizational change and development: Challenges for future research. *Academy of Management Journal, 44*(4), 697–713.

Remeniy, D., Williams, B., Money, A., & Swartz, E. (2002). *Doing research in business and management*. London: Sage.

Romano, C. (1989). Research strategies for small business: A case study. *International Small Business Journal, 7*(4), 35–43.

Rowley, J. (2002). Using case studies in research. *Management Research News, 25*(1), 16–27.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. London: Financial Times Prentice Hall.

Sedmak, M., & Longhurst, P. (2010). Methodological choices in enterprise systems research. *Business Process Management, 16*(1), 76–92.

Silverman, D. (2010). *Doing qualitative research*. London: Sage Publications.

Smith, M. (2003). *Research methods in accounting*. London: Sage Publications.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Taylor, S. J., & Bogdan, R. (1988). *Introduction to qualitative research methods: A guidebook and resource*. Chichester, New York: Wiley.

Tilley, L., & Woodthorpe, K. (2011). Is it the end for anonymity as we know it?: A critical examination of the ethical principle of anonymity in the context of 21st century demands on the qualitative researcher. *Qualitative Research, 11*(2), 197–212.

Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Production Management, 22*(2), 195–219.

Walsham, G. (1993). *Interpreting information systems in organisations*. Chichester, UK: Wiley.

Walsham, G. (1995a). Interpretive case studies in IS research: Nature and method. *European Journal of information Systems, 4,* 74–81.

Walsham, G. (1995b). The emergence of interpretivism in IS research. *Information Systems Research, 6*(4), 376–394.

Weber, R. P. (1990). *Basic content analysis* (2nd ed.). Newbury Park, CA: Sage Publications.

Weerakkody, V., Dwivedi, Y., & Irani, Z. (2009). The diffusion and use of institutional theory: A cross-disciplinary longitudinal literature survey. *Journal of Information Technology, 24,* 354–368.

Yin, R. (2009). *Case study research: Design and methods*. London: Sage Publications.

Zhang, Y., & Wildemuth, B. (2009). Qualitative analysis of content. In B. Wildemuth, B. (Ed.) *Applications of social science research methods to questions in library and information science*. Englewood, Co: Libraries Unlimited.