



Integration of Grounded Theory and Case Study: An Exemplary Application from e-Commerce Security Perception Research

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Abstract:

This paper is written with two main aims: first, to justify the use of grounded theory (GT) as a data analysis method in a manner compatible with the case study strategy, by using Straussian GT in this integration. The need for this integration is vital, as no conceptual research specifies how grounded theory can be used as a method within an interpretive case study strategy in order to define a research methodology. The second aim is to demonstrate the applicability of the proposed methodology, which has resulted from the integration, by providing a typical example of applying the methodology's steps to the empirical research conducted in the area of the security perception of e-commerce.

Keywords: grounded theory, Straussian GT, case study, IS research methodology, e-commerce, security perception

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INTRODUCTION

Grounded theory has been used by many Information Systems (IS) researchers since the beginning of the 1990s (see Orlikowski 1993; Urquhart 2001; Fernández et al. 2002; Linden and Cybulski 2003; Allan 2003; Sorrentino and Virili 2005; Hansen and Kautz 2005; Coleman and O'Connor 2007). It is becoming increasingly popular in IS research, as there is a widely held belief that it is a reliable method for investigating social and organizational phenomena.

The general goal of grounded theory is to generate theories derived from data in order to understand the social context. It is a "qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon" (Strauss 1990, p. 24). Grounded theory is also viewed as a research methodology. On his current website,¹ Glaser points out that many people call grounded theory a qualitative method, although it is not. He states that "It is the systematic generation of theory from systematic research. It is a set of rigorous research procedures leading to the emergence of conceptual categories." Urquhart and Fernández (2006) also pointed out what Glaser stated in a conference discussion: "Let me be clear. Grounded theory is a general method. It can be used on any data or combination of data." This indicates that data can be quantitative and qualitative.

Hekkala (2007) indicates that grounded theory has been used in IS research as a method (by, among others, Urquhart 2002; Jones and Hughes 2004), but that it has also been sometimes used as a methodology (by researchers, including Orlikowski 1993; Goulding 1999; Goede and Villiers 2003). Hekkala states that those who use it either as method or as a methodology do not soundly and logically demonstrate and justify their use of this theory for either of those purposes. The current author defines a method as a procedure or technique used to collect and/or analyze data, while a methodology refers to the entire research process, from the identification of one or more research questions and the selection of a research strategy, through to the formulation of the findings and results, in which the entire process is based on philosophical assumptions (ontology and epistemology). This view of the two terms coincides with Avison and Fitzgerald's (1995) definitions: a methodology is a collection of procedures, techniques, tools, and documentation which is based on some philosophical view; otherwise it is merely a method, like a recipe. Therefore, a case study strategy that includes a grounded theory analysis, which is based on interpretive assumptions can be classed as a methodology. The aim of this paper is to show that grounded theory (as a method) can be combined with case study strategy to construct a compatible research methodology and to highlight how this combination may be achieved. Then an illustration is provided for applying the proposed methodology to empirical research in the area of e-commerce security perceptions.

The rest of this paper is comprised of nine sections. The first presents the philosophical paradigms of information systems (IS) research and their influence on method selection. The next section discusses the case study research method. The third section discusses the two approaches to grounded theory, and the fourth section explains the procedures and techniques of grounded theory as a method for data analysis.

CONTRIBUTION

This paper provides two main contributions to IS research:

1. For all IS researchers, this paper provides theoretical development in methodology. In particular, it justifies the use of Straussian GT in conjunction with case study research, under interpretive assumptions, as a methodology. Further, It provides a road map for IS researchers who conduct qualitative-based studies (that combine the two methods) starting from formulating the research problem and question(s), through data collection and analysis, to evaluating the quality of the research, the last being absent from most published IS qualitative studies.
2. Second, for beginner IS researchers who want to use grounded theory, it provides them with the main issues that they need to understand if they want to use grounded theory (Straussian GT) as a method with case study research, by showing how the procedures and techniques of case study and grounded theory are compatible. This paper also provides an exemplary application of this methodology to an empirical study conducted in the area of the security perception of e-commerce to provide evidence for the methodology's effectiveness and applicability.

¹ www.groundedtheory.com/



The fifth section justifies the reasons for using grounded theory (the Straussian approach is discussed in the next sections) in combination with case study strategy to construct a methodology emerging from this integration, while the sixth section shows the criteria for evaluating the proposed methodology and presents the roadmap, including all the methods and techniques, covering every stage of the research. The seventh section provides an example for applying the proposed methodology to empirical research. The eighth section provides discussion on the methodological integration. The final section provides a conclusion.

IS RESEARCH PARADIGMS AND ASSOCIATED RESEARCH METHODS

Klein and Myers (1999) distinguish three paradigms of IS research: positivist, interpretive, and critical. These paradigms are different according to philosophical assumptions about whether the empirical world (ontology) is considered to be objective and to exist independently of humans, or is subjective and constructed through human action and beliefs. Also, there are assumptions about the nature of knowledge (epistemology) and how it is created and evaluated.

Positivist research considers that the social world exists independently of human action and beliefs and can be described by measurable variables which are independent of the researcher and human action and experience (Orlikowski and Baroudi 1991). It is concerned with testing theories in order to predict and discover facts and laws. Interpretive research considers that the world is constructed and interpreted by the human actions and beliefs and that the main aim of interpretive research is to understand the phenomena and make sense of the research problem through accessing the meanings that are assigned by humans (Orlikowski and Baroudi 1991). Interpretive research considers that scientific knowledge is not captured in hypothetical deductions, but through the understanding of the human and social interactions by which the subjective meaning of the reality is constructed (Walsham 1995). Critical researchers believe that social reality is historically constructed and that it is formed and reformed by people (Myers and Avison 2002). The basic difference between critical and interpretive research is that the former is transformative in its nature, focusing on changing the status quo (e.g., “related to emancipation and empowerment”), while interpretive research can be seen as more neutral and descriptive (Khazanchi and Munkvold 2003). Klein and Myers (1999, p. 3), state that “IS research can be classified as critical if the main task is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light.”

Research methods are usually classified into quantitative and qualitative. Grounded theory, case study, ethnography, and action research are qualitative research methods that are typically associated with interpretive paradigms. However, grounded theory can fit all research paradigms. For example, Urquhart et al. (2010, p. 361) argue that following Glaser, the grounded theory method is “paradigmatically neutral” and, therefore, can be used in positivist, interpretive, or critical studies. Butler and O’Reilly (2010) take the view that the IS researcher can be objective, neutral, and rational, as opposed to being involved in the life-world in which subjectivity, prejudice, and irrationality are often the focus. Charmaz (2006, p. 9) also view grounded theory as neutral in many ways and as a container into which any content can be poured. In addition, Urquhart et al. (2006) pointed out that it is difficult for researchers to place the grounded theory method within their epistemological assumptions precisely because of the tension-filled history of the co-founders, namely Strauss and Glaser.

Furthermore, a case study as a qualitative research method can be either positivist or interpretive (Myers and Avison 2002). For example, if a case study focuses on exploring the perception of technical personnel on e-commerce security within a particular organization in which the researcher’s role is solely to test the hypotheses and/or find the answer to predefined and fixed questions (i.e., there is no change in the questions in response to the answers provided by the participants; the interviews were simply used to collect the answers to these questions), then this case study is based on positivist assumptions that are designed and evaluated according to the criteria of natural science research. They involve controlled observation, testing, deduction, and the ability to generalize, rather than making interpretive assumptions. Interpretive research is not concerned with hypothesis-testing and repeatability, but rather focuses on understanding the context of the research problem, which more readily accepts new emergent issues and concepts and involves developing the initial research questions based on early user responses. Therefore, it is crucial when integrating two or more methods, such as those proposed within this paper (with respect to case study and grounded theory), to ensure that the philosophical assumptions behind the methods are the same.

CASE STUDY RESEARCH

The case study method is used frequently by IS researchers, and many consider it appropriate for investigating IS phenomena (Benbasat et al. 1987; Orlikowski and Baroudi 1991; Walsham 1995; Darke et al. 1998), as it helps to understand the problem in its natural setting. Benbasat et al. (1987) stated three important reasons why the case study method is suitable for IS research: (1) the researcher can collect data and obtain evidence from a natural setting, then generate theories from practice; (2) the case study research method enables the researcher to answer “how” and “why” questions; (3) the case study method is an appropriate way to research an area in which few

previous studies have been carried out. Yin (1994, p. 13) defines case study research as “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.” Case studies can be either positivist or interpretive (Walsham, 1995; Darke et al. 1998). Positivist case studies are designed and evaluated according to the criteria of natural science research, with controlled observation, deduction, and the ability to generalize (Lee 1989). In contrast, interpretive case studies are not concerned with repeatability, but focus on the principles of the interpretive paradigm (Darke et al. 1998). The researcher does not view himself as an observer from a distance; rather, he shares the concepts and interpretations with the informant (Walsham 1995). Researchers use case studies to test existing theory or to generate and develop new theory (Yin 1994; Darke et al. 1998), and sometimes the research question shifts from theory testing to theory building during the research (Eisenhardt 1989). In the current paper, the author focuses on integrating interpretive case study that aims to build theory.

Yin (1994) states that research propositions direct the researcher to focus on what kinds of information to collect. These propositions emerge from the literature and existing theoretical constructs. Identifying previous constructs or factors guides the researcher to form the preliminary design of theory-building (Eisenhardt 1989). After identifying the research propositions and questions, the researcher needs to specify the case and unit of analysis (Benbasat et al. 1987; Yin 1994). A case may be a project or system (e.g., a geographical information system, IT governance, or a management strategy such as outsourcing) (Paré 2001). Its focus may be on individuals, groups, and/or entire organizations (Benbasat et al. 1987). In some cases an individual person is the case being studied, and the individual is the primary unit of analysis (Yin 1994). Yin identifies six sources of qualitative evidence in case study research: documents, archival records, interviews, direct observation, participant-observation, and physical artifacts. Yin proposes using a case study protocol to increase the research reliability. A case study protocol is a document containing more than the interviews; it also sets out the procedures and general rules that should be followed by the researcher, and is prepared before the data collection phase (Yin 1994). The protocol comprises an overview of the case study project (objectives, issues, topics being investigated) in order to communicate to the reader the general topic of research and the purpose of the case study. Case study protocol comprises interview protocols which specify the issues to be discussed with the respondents and questions to be kept in mind during the interview. The other method proposed by Yin (1994) to increase reliability is the use of a case study database which includes raw material such as interview transcripts, researcher’s field notes, coded data, memos, and other analytic material.

One of the main criticisms of case study is related to the analysis of large amounts of qualitative data where there is no standard analytical approach (Darke et al. 1998). Another common criticism is the inability to generalize from a single case study. Yin answers that case studies are generalizable to theoretical propositions and not to populations or universes; the case study does not aim to represent a sample, and the aim of the researcher is to provide “analytical generalization” rather than “statistical generalization.” As noted also by Walsham (1995), the purpose of generalization from a case study is to extend and generate concepts and theory, and to draw specific implications. Another weakness is that the availability of suitable case study sites is limited because organizations are not always willing to participate in such research (Darke et al. 1998).

GROUNDED THEORY VARIANTS

Grounded theory was developed by Glaser and Strauss (1967), and their combined work can be considered as the first version of this theory. Strauss and Corbin (1990, 1998) subsequently developed and extended the original theory, which later faced criticisms from Glaser (1994, 2002). The divergence between the two original authors leads to what is commonly termed the *Glaserian approach* and the *Straussian approach* to grounded theory (Hekkala 2007). In the IS field, many researchers have applied grounded theory without even mentioning that there are two distinct approaches. Hekkala (2007) confirms this by giving examples of papers (see, for example, Orlikowski 1993; Galal and McDonnell 1997; Lubbe and Remenyi 1999; Lehmann 2001; Rowlands 2005) where there is no mention as to the variant of grounded theory being adopted. Thus, identifying the attributes of the two approaches is essential to help researchers be aware from the outset as to which approach is more appropriate to their research and which to adopt with case study research.

The role of existing literature within research activities is clearly different between the two approaches. Specifically, Glaser (1992) asserts that the literature should not be examined before commencing the study so as to avoid constructing prior assumptions and beliefs which might unconsciously bias the researcher. He says that “there is a need not to review any of the literature in the substantive area under study” (Glaser 1992, p. 31). He continues by stating that the “pre-study literature review of QDA [Qualitative Data Analysis] is a waste of time and a derailing of relevance for the GT [Grounded Theory] Study” (Glaser 2004, p. 9). Glaser supposes that the research problem and questions are discovered only once coding begins and “the research question in a grounded theory study is not a statement that identifies the phenomenon to be studied” (1992, p. 25).

In contrast, Strauss and Corbin (1990) acknowledge that there should be some survey of the literature before the fieldwork commences and that the researcher enters the research area with some knowledge of the phenomenon being studied. They believe that the literature can be used to derive questions that the researcher desires to use in field work. They state that “the research question in a grounded theory ... tells you what you specifically want to focus on and what you want to know about this subject” (p. 38). They also state that the literature directs the theoretical sampling and is helpful for theoretical sensitivity (see later sections for definition of these terms). Furthermore, it can be used as a way for supplementary validation, meaning that after the researchers finish their research, they could show how it differs from previous literature or includes common findings.

Hekkala (2007) states that the Straussian approach is an inductive-deductive one: deductive in that the researcher has some preconceived theories and hypotheses, and inductive in that it enables new concepts to emerge. Surveying the existing literature is necessary in order to help the researchers identify the relevant concepts and theories of their research. It lets the researcher make sense of data that is gathered from the fieldwork.

Glaser (2002) criticizes the Straussian approach, stating that he is forcing a theory from the data because he forces data into predetermined paradigm model relationships (i.e., cause, condition, context, and consequence) rather than letting any theory emerge. In the Glaserian approach, the researcher does not have to find preconceived causes, consequences, or action/interaction relationships (Glaser 1992). According to Glaser this paradigm model is the aim of qualitative data analysis, termed by him to be a “full conceptual description.” For this reason, as stated by Hekkala (2007), Glaser claims that the Strauss and Corbin (1990) approach can be considered only as a method providing techniques for data analysis, not as a methodology. Glaser (2004) states that the original version of grounded theory (Glaser and Strauss 1967) is a methodology, while the later versions are QDAs. Glaser (1992, 2002) maintains that the Straussian approach focuses on conceptual description by spending time describing the researched situation and categories without abstracting the time, people, and place, while the original or classical grounded theory, as he likes to name it (Glaser 2004), focuses on conceptual analysis by concentrating on conceptualization and abstraction of data, and generates conceptual hypotheses that can be applied to any relevant times, places, and people. However, Strauss and Corbin (1990) also claim that the researcher who uses grounded theory should analytically move from description to conceptualization in the selective coding stage. The current researcher has adopted the Straussian approach to grounded theory and will justify this choice in the next sections.

GROUNDING THEORY PROCEDURES

This section elaborates on Strauss’s procedures of analysis in order to show subsequently how these can be combined with the case study research strategy to form a viable research methodology. Hekkala (2007) notes that most IS researchers rely on Strauss and Corbin’s (1990) book, which concentrates on providing techniques for researchers who want to use grounded theory.

Sampling in grounded theory is based on theoretical sampling, on the basis of concepts that have been shown to have theoretical relevance to the developing theory. It is related to the sampling of new data based on the analysis of data initially collected from the previous interviews, where the concepts that emerge constantly guide the researcher as to the nature of future data, their sources and the issues to be discussed in subsequent interviews in order to develop the categories. The initial questions for the fieldwork are based on concepts derived from literature (i.e., data gathered previously), which provides the researcher with a starting point and a focus; later, the sampling becomes more in-depth. Strauss and Corbin (1990) explain that the sampling should focus on sampling incidents and not persons per se—in other words, collecting data about what informants do or do not do in terms of action/interaction, condition, and consequence of the action. The researcher continues this process until the theoretical base is saturated, where no new data emerges regarding categories and their relationships.

Coding is the key process in grounded theory (Strauss and Corbin 1990). It begins in the early stages after the first interviews for data collection. Strauss and Corbin (1990) assert that the coding procedures in grounded theory are neither automatic nor algorithmic—“we do not at all wish to imply rigid adherence to them” (Strauss and Corbin 1990, p. 59). In other words, flexibility may be necessary in certain circumstances. This process comprises three coding steps. The three steps of coding are open, axial, and selective coding.

Open coding is “the process of breaking down, examining, comparing, conceptualizing and categorizing data” (Strauss and Corbin 1990, p. 61) by which concepts and their properties and dimensions are identified from data that are transcribed by the researchers. This can be achieved either line by line or by focusing on main ideas in sentences or paragraphs. Each code represents a word or sentence containing a meaningful idea, and a group of codes (two or more) forms a concept. A concept is an abstract representation of an event, object, or action. In open coding, events, objects, and actions are compared with others in terms of similarities and differences in order to give them, when similar, the same name. The name or label that is assigned for a category should be selected logically and usually seems to represent the data and be related to it. A reading of the literature gives the researcher an initial

set of concepts that can be used, but researchers should not be constrained by these concepts; rather they should focus on the words and phrases used by the participants themselves. It is in this way that names are assigned to categories (Strauss and Corbin 1990).

Axial coding is the process of reassembling data that were broken down through open coding. Essentially, it is the process of relating categories to subcategories. Categories are higher in level and more abstract than concepts and are generated by constant comparison of the similarities and differences between such concepts. This is done by using what is called the *paradigm model*, which enables the researcher to think systematically about the data and relate them to each other. This model addresses the relationships between the categories by considering the following aspects: *causal conditions, phenomenon, context, intervening conditions, action/interaction strategies, and consequences*.

Selective coding is the process of integrating and refining the theory. The first step in integration is to identify the central or core category, which represents the main theme of the research. To be core, the concept must appear repeatedly in the data. The central category acts as a master that pulls the other categories together to form an explanatory “whole picture” by using the paradigm model. In this step the categories are refined at a high level of abstraction, and categories that need further explication are given more descriptive details. The integration is not dissimilar to axial coding, except that it is done at a higher, more abstract level of analysis, and the subcategories are linked to the core category. Finally, a story line which is a conceptualization of a narrative description of the study’s central phenomenon is analytically explained.

In summary, the following sequence is followed in grounded theory in order to arrive at the research model (theory), which is grounded from the data:

Codes→Concept(s)→Categories→Model (Theory)

Throughout this process, two analytical techniques are used. The first is constant comparative analysis, which is a continuous process of identifying conceptual categories and their properties emerging from the data by consistent comparison of that data. The researcher needs to be sensitive, which means the ability both to identify what data is significant and to assign it a meaning. This sensitivity comes from experience, especially if the researcher is familiar with the subject under investigation. The literature review is another source of the theoretical sensitivity (Strauss and Corbin 1990), and so are the expressions of the interviewees themselves, in particular when they repeat the same phrases and concepts. The other technique is the asking of questions. Once the researcher names the concept (event, idea, action, and incident), he or she then asks questions regarding such things as what this is and what it represents.

JUSTIFICATION FOR USING GROUNDED THEORY AND IN PARTICULAR THE STRAUSSIAN APPROACH WITH CASE STUDY STRATEGY

Fernández et al. (2002) and Fernández (2005) state that grounded theory (the Glaserian approach) and case studies can be used in combination. Fernández et al. (2002) adopt a Glaserian approach with this combination. However, this appears incongruous, as the use of this approach means that the researcher should not review any literature before the fieldwork, and that the research question is based on the emergence of codes during data collection and analysis—yet this is contradictory to the case study research that was developed by Yin (1994).

Hughes and Jones (2003) state that grounded theory is consistent with interpretive case studies that investigate social and organizational contexts. They suppose that there are some justifiable reasons for the use of grounded theory in interpretive case studies. Nevertheless, they do not show how and why the case study is consistent with grounded theory and, therefore, could be combined to form a methodology, and which variant of grounded theory is more appropriate.

Hughes and Jones (2003) also state that empirical work shows a discrepancy between the interpretive perspective and the grounded theory procedures by which it ought to be applied, where the procedures of coding, comparing, categorizing, and saturating have a positivist and mechanistic attitude. However, Strauss and Corbin (1990) defend their position, stating that the procedures used in grounded theory are neither automatic nor algorithmic, and that they do not compel the researcher to adhere completely to them. Furthermore, by using the techniques of constant comparative analysis and of asking questions for each code (i.e., What does this mean, and what does it represent?), interpretations are made by the researcher, especially when new concepts emerge; this is still under the interpretive assumption that the researcher is considered part of the research process.

Pandit (1996) proposed a framework that he adopted in his doctoral study for building theory which was dependent on Strauss and Corbin’s (1990) grounded theory variant and which incorporated some elements of the case study



research method. This framework demonstrates the procedures from defining the research question to building the theory, and ends by comparing the resulting theory with the literature. However, while this framework provided useful guidelines for building the theory, and while the framework has some identical procedures to that defined in the proposed methodology in the present paper, Pandit's paper does not provide answers as to why the Straussian approach, and not the Glaserian one, can be integrated with case study research.

Eisenhardt (1989) also provided a roadmap for building theories from case study research. However, since her paper was written in 1989, she did not consider which approach to grounded theory should be combined with case study, as there was no debate about the grounded theory method and its variants at that time. In this paper, the author argues that not all grounded theory approaches can be considered compatible with case study research. The current paper aims to justify the use of the Straussian approach to grounded theory with case study to establish a research methodology. Further, Eisenhardt did not refer to specific criteria for evaluating the theory or for the entire process of building theories. She merely posed some questions that should be answered by the researcher with regard to the theory itself. The evaluation was for only the final product, which is the theory. She pointed out that there is no general assessment for this type of research (i.e., research that builds theories from case studies). However, this adds some ambiguity concerning how to evaluate the generated theory and the process of building it. In the current paper, four evaluation criteria will be used, which concentrate on assessing the quality of the entire research process. Figure 1 (see the next section) provides a more methodological approach than the process provided by Eisenhardt, in which the inputs, outputs, techniques, outcomes, and processes are more systematic for IS researchers. Eisenhardt did not explicitly show how and when grounded theory techniques (e.g., theoretical sampling and constant comparison) are applied within case study research, as shown in Figure 1, which demonstrates that theoretical sampling and constant comparative analysis are applied during both data collection and data analysis. Finally, Eisenhardt did not address the weakness of case studies, which can be overcome by merging with grounded theory, as this paper argues.

In essence, there is a similarity between the case study method and the Straussian approach to grounded theory (see Table 1). The case study strategy devised by Yin (1994) suggests that the researcher should start with a specified problem statement and a set of research questions and propositions. He states that research propositions direct the researcher to focus on what kinds of information to collect; with no research propositions the researcher might be tempted to collect everything. These propositions emerge from existing literature. He furthermore refers to the literature review in order to develop the case study protocol which includes the research objectives and case study questions that are used as a reminder rather than as the actual questions by which data is collected from the interviewees. Identifying previous constructs guides the researcher to form the preliminary design of theory-building and serves to evaluate them accurately in interviews (Eisenhardt 1989). Eisenhardt states that it is important for researchers to recognize that it is impossible, even in the case of theory-building research, to start with a clean theoretical base, but that researchers should predetermine prior variables without finding relationships between them. They should also not be restricted by only those prior variables, as sometimes new factors are found during data collection that need to be added and which can reform the theory. This also agrees with Strauss and Corbin's (1990) claim that the researcher cannot start without any literature on the phenomenon that is being studied; nevertheless, the researcher is not limited by the literature and embraces the flexibility of accepting emergent ideas. Moreover, the research question in grounded theory should tell the researcher specifically what to focus on and what the researcher wants to know about the subject of research. Therefore, there is no restriction in merging the two methods, as both concur in this principle.

The generalization of the research findings by case study and grounded theory is similar. Grounded theory aims to develop theories and concepts that can be generalized and applied to other situations. The generalizability of the grounded theory is partly achieved through a process of abstraction; the more abstract the concepts, the greater the theory applicability (Strauss and Corbin 1990). Walsham (1995) specified that generalization in interpretive research is achieved by the developing of concepts, the extending and generating of concepts and theories, and the drawing out of specific implications.

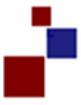
Table 1: Differences and Similarities Between Case Study and Straussian Grounded Theory

Case Study	Grounded Theory
Differences	
The fieldwork/phenomenon is a specific, bounded system.	No specific boundary Data collected from any context according to the emergent issues
Clear statement of the research problem and questions before entering the field under study	Research problem and questions are continuously developed as soon as researchers start collecting data about the phenomenon under study.
The outcome is a detailed description of the case and the units of analysis.	The outcome is conceptual categories and theories. Research problem and questions are continuously developed as soon as researchers start collecting data about the phenomenon under study.
Less rigorous procedures and techniques for analyzing data (e.g., pattern matching and explanation building)	Systematic data analysis procedures and techniques (theoretical sampling, constant comparative analysis, theoretical sensitivity coding steps, paradigm model, and data saturation)
Similarities	
Survey the literature	Survey the literature
Different sources of data collection	Different sources of data collection
Can be interpretive or positivist	Can be interpretive or positivist
Generalization in interpretive case study research involves developing theories and concepts and drawing out specific implications.	In GT, generalization is achieved through the higher abstraction of concepts.

One of the main criticisms of the case study is related to the analysis of a huge amount of qualitative data where no standard analysis approach exists (Darke et al. 1998). Therefore, this justifies the need for systematic procedures for analyzing the data collected from case studies. The marriage is achieved to improve the weaker aspects of the other. In this case, grounded theory is used to support the case study research with regard to the data analysis procedures and techniques. In addition, the case study proposed by Yin (1994) is evaluated based on criteria that are appropriated for positivist research. However, other criteria (discussed in the next section) which are suitable for interpretive research will be used, which makes the evaluation of the proposed methodology more rigorous. Evaluation of the research conducted on grounded theory focuses mainly on the assessment of the theory. Consequently, there are weaknesses related to evaluation of the research conducted using grounded theory as the focus, mainly concerning the generated theory and neglect of the quality of the entire research process.

The chief characteristic of case study research is the specification of the boundary, the scope of the research cases, and the unit of analysis (e.g., organization, group of people, system, activity); this can be considered a weakness, as the possibility of emerging issues is not limited to a specific boundary in which some issues may emerge and incite the researcher to perform a cross-case analysis. It does not bind with one boundary, rather, moving outside of the boundary. This is supported by applying the grounded theory concept of theoretical sampling.

One of the issues that may emerge regarding this combination is whether there are any differences between integrating a single case study with grounded theory and integrating multiple case studies with grounded theory. Yin (1994) states that the case study can be single, either if it is unique or revelatory, or if it represents a critical case for testing a well-formulated theory. Walsham (1995) states that a single case study allows the in-depth investigation of the phenomenon and the collection of a rich description. Benbasat et al. (1987) also state that a multiple case study is good when the aim is to describe some entity from different perspectives, to build theory, and/or to perform cross-case analyses and comparisons, which ultimately lead to more general research results. The present author believes that the way of analyzing data under the proposed case study and grounded theory integration is similar regardless of the number of cases. However, in terms of theory constructing and richness, as the number of cases investigated and analyzed grows (Eisenhardt suggested that the number of cases from four to ten is desirable for theory building using case study research), the theory may become more coherent and more able to cover variant situations. If a comparison between cases is the intent, then the unit of analysis within each case should remain



identical, as should the procedures of analysis. Furthermore, constant comparative analysis between segments of data continues to apply to data irrespective of whether that data has been gathered from case number one or case number n.

EVALUATION OF THE PROPOSED METHODOLOGY

Yin (1994) has proposed a set of tests and criteria (validity and reliability) for evaluating the quality of a case study. Strauss and Corbin (1990) also define a set of criteria and a group of questions in order to ensure that concepts, categories, and theories are fully developed and grounded. Yin's (1994) criteria are not adopted in this paper for evaluating the proposed methodology, which combines case study and grounded theory, because these criteria are measures suitable only for positivist quantitative research and are not for interpretive qualitative research (Golafshani 2003). Whereas positivist quantitative research aims to test and predict hypotheses, interpretive research aims to understand the phenomenon within its natural setting and taking into account human insight. Thus, the criteria for evaluating the positivist view are not appropriate for the interpretive, since the aim of each one is different. On the other hand, Strauss's criteria could form the basis of the evaluation in particular of generated concepts and theory. Because both case study and grounded theory are integrated under the umbrella of interpretive qualitative research, the combination of both as a methodology involves finding a mutual basis on which to evaluate that methodology. This is why Lincoln and Guba's (1985) criteria are adopted: they are designed for interpretive qualitative research in general, and their criteria evaluate the entire research process. These criteria are:

- Credibility, which demonstrates that the research was conducted in such way that its subject was correctly identified. Credibility is enhanced by using multiple sources as evidence for data, by assigning to various respondents the concepts and meanings that have been gathered in order to find matches, by allowing participants to check their interview transcripts and give comments on them, by using data triangulation, and through prolonged engagement in fieldwork.
- Transferability, which shows whether the findings can be generalized to other situations. The generalization in interpretive qualitative research is not deduction from small samples to large populations, but is rather to show how certain findings can obtain the same results when they are transferred to other contexts with similar properties. This can be achieved by providing the reader with rich, detailed information about the context that has been investigated.
- Dependability, which shows that the research process is systematic and well-documented and can be traced, and which gives documentation of the methods and approaches used in the research.
- Conformability, which assesses whether the findings emerge from the data collected from cases, and not from preconceptions, by showing raw data and demonstrating the steps of the analysis leading to the extraction of results and outcomes.

Interestingly, Pandit (1996) assessed his methodology, which combined case study and grounded theory, using Yin's criteria. As mentioned above, these criteria are not appropriate for interpretive research. In essence, Pandit did not distinguish between the IS research paradigms in his framework and consequently provides no acknowledgement as to whether the case studies in his framework are positivist or interpretive, and of the different evaluation requirements of each.

Figure 1 illustrates how grounded theory can be integrated with the case study research strategy to form a research methodology. As shown in this figure, the researcher starts with a general research topic. In order to identify gaps, discover new areas of research or extend the existing body of knowledge, the researcher reviews the literature. Based on this survey, the problem studied becomes more limited and the research question is identified; this defines the aim of the research. The survey helps the researcher to identify the relevant concepts and theories pertaining to the research question, and consequently models or a set of propositions (concepts) are proposed. It is important to note that these concepts or models are identified not to be tested or validated, but rather to provide initial ideas about the phenomena under investigation (this concurs with Eisenhardt's theory generation from case study [1989]). They serve to enhance theoretical sensitivity and sampling. The cases and units of analysis are selected for their relevance to the research question, and the research protocol is prepared, including research questions to be asked in the field, by allowing for flexibility to enable new data to emerge. These data are collected principally from interviews, but possibly also from documents, observations, and artifacts. In fieldwork, the interplay between data collection and analysis is processed simultaneously by identifying ideas emerging from the first interviews, so that the area under study becomes more focused as time progresses. At the same time theoretical sensitivity and sampling and constant comparison between data are taken into account, finally resulting in that data becoming saturated, which is the point at which no new ideas emerge. A systematic process of coding begins once the empirical data has been gathered, at each step of which there are outcomes: codes and concepts, categories, and relationships between them. These ultimately form the research model. It could be that the resulting categories and relationships are not fully saturated, so a second round of data collection and analysis is initiated, which develops a

new version of the research model. The entire process that results in the research model is then evaluated according to criteria of credibility, transferability, dependability, and conformability. Finally, the researcher may show the originality and the contribution to the literature by comparing the present research with the previous work and the initial model.

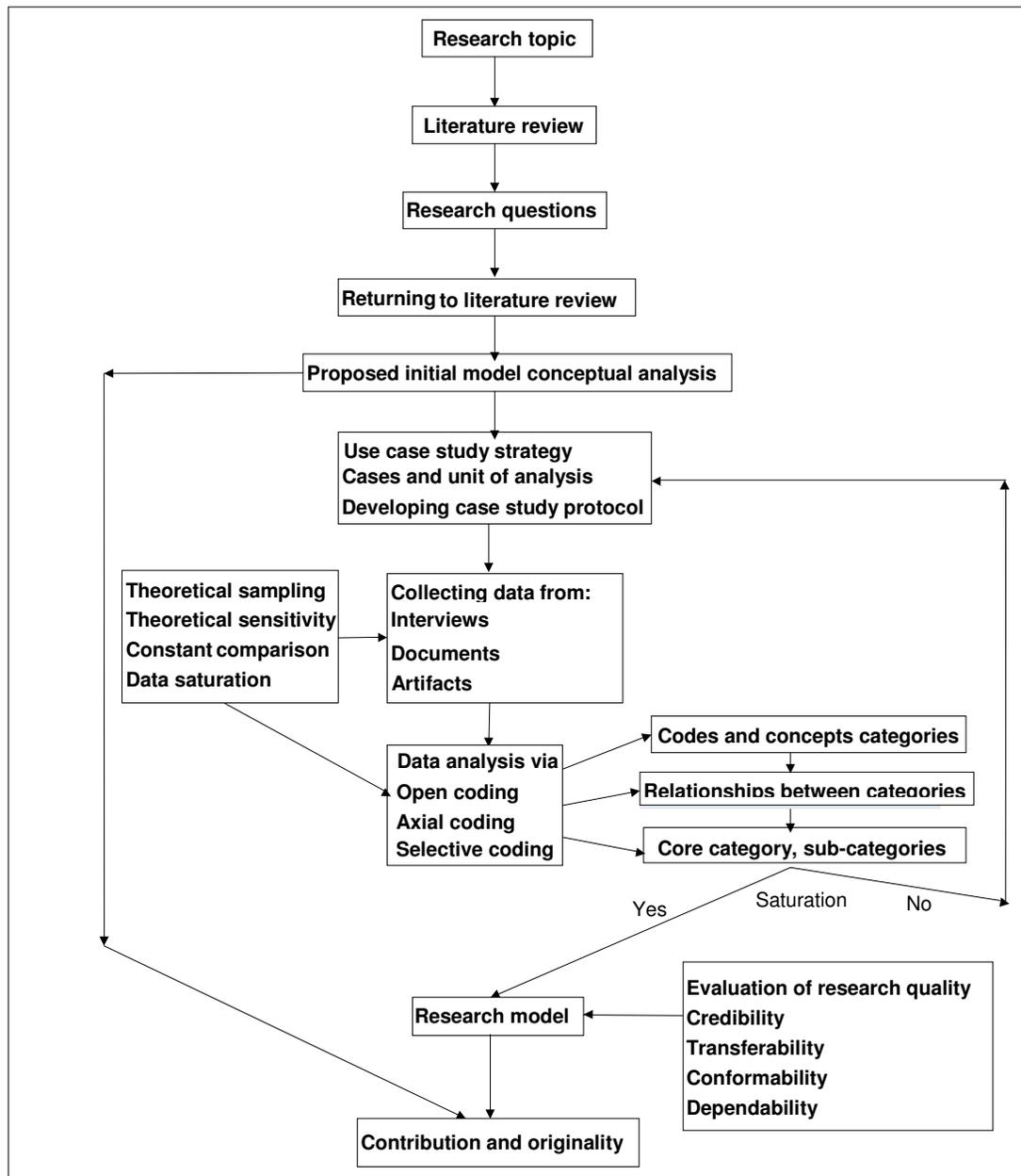


Figure 1: Case study: grounded theory methodology.

APPLICATION OF THE PROPOSED METHODOLOGY

This section presents an example of application of the proposed methodology to an empirical study conducted in the area of the security perception of e-commerce. The researcher operationalized the steps, techniques, methods, and procedures explained in Figure 1. The following subsections demonstrate the application of the methodology's steps. It is worth mentioning that the focus is on the application of the proposed methodology rather than the research results. Therefore, only a sample of the collected data was provided to illustrate how the concepts were extracted and conceptualized.

Research Background and Literature Review

In the literature, and from the IS perspective, most security research relevant to e-commerce focuses either on the organization (including technical implementation) or on the customer. Some of these studies identify the processes

and factors required to implement a secure e-commerce application from the organizational perspective (Knorr and Rohrig 2001; Lichtenstein and Swatman 2001; Kesh et al. 2002; Ruppel et al. 2003; Hutchinson and Warren 2003; Sengupta et al. 2005; Zuccato 2007). Other research investigates customers' perception of security and risk awareness in e-commerce (Salisbury 2001; Chellappa 2002; Suh and Han 2003; Milne et al. 2004; Yenisey and Salvendy 2005; Singh 2006). However, little research has explored e-commerce security as a single phenomenon by considering the customer and the organization jointly as the main participants in e-commerce. Such research would enable organizations to use certain security solutions that support customers' objectives and perceptions in order to reduce the gap between the technology being implemented by organizations and that being perceived by customers. There is no mention in the literature of the interrelationships between the factors and their relative impact on the effectiveness of e-commerce security. This research fills this gap by identifying and relating factors identified from the perspective of both the customer and the organization. This research was undertaken in Jordan, an environment in which no other research on security perception in e-commerce has been conducted (at the time of conducting this research). Most of the existing research that has been conducted in Jordan confirms the security concerns in e-commerce and Internet banking, but without exploring the issue in depth (Sahawneh 2002; Alsmadi 2004; Al-Sukkar 2005; Titi 2005; Al-Qirim 2007). This makes Jordanian organizations and customers alike hesitant to participate in e-commerce, thus restricting its growth. Therefore, security in e-commerce is a vital area of research both globally and specifically in Jordan.

Research Question

The general research question is thus:

What are the factors and their interrelationships that influence the effectiveness of e-commerce security in Jordan?

This main research question can be usefully divided into three sub-questions:

1. What is the customer's perception of the security of e-commerce-websites?
2. What is the organizational view of the managerial, technical, and customer concerns regarding e-commerce security?
3. How can the organizational and customer views on e-commerce security be integrated into a coherent framework that provides guidance to decision makers?

Main Propositions

The researcher believes that the effectiveness of security in e-commerce cannot be assured without the awareness of security from the customer viewpoint on one hand and the implementation of security solutions by organizations on the other. If the customer is aware of security features in e-commerce, but the organization does not provide sufficient security solutions in the website, then there is no effective security; rather, there is a requirement to apply solutions which satisfy the customers' needs. Similarly, if the organization implements the best technical solutions that provide full security, without the perception and awareness on the part of customers that the website is secure, then these technical solutions mean nothing. Therefore, both perspectives are vital and complementary in ensuring effective security in e-commerce.

Investigating security concerns from both perspectives is significant as it provides in-depth comprehensive insight and enables the researcher to check the perception of each side. Such research would allow organizations to use certain security solutions that support customers' perceptions so as to reduce the gap between the technology being implemented by organizations and that being perceived by customers. Mistaken actions by the organization could then be corrected to meet the customers' perceptions, as well as fostering a better understanding of the nature of Internet users. Furthermore, this would enable the researcher to highlight the differences and similarities between the two perspectives.

There are many barriers, factors, and challenges hindering the adoption and success of e-commerce in Jordan. Much research has confirmed that and is ongoing. Security is one of these challenges. The researcher considers it wise to investigate each factor and challenge (e.g., security) separately in depth, in the hope that solving difficulties, making improvements, and obtaining insight into each factor ultimately will enhance the adoption of e-commerce.

Case Study and Unit of Analysis

In this research, two case studies were selected for the fieldwork. The first case was comprised of a group of individual customers ($n = 15$) who are educated and experienced Internet users, some of whom are familiar with online transactions. The participants' ages were between twenty and thirty-five. The second case was comprised of a group of key people from several organizations, including managerial and IT staff from several business and IT

companies (n = 12). In summary, this second group included three IT managers, three business managers, an e-business director, an IT security manager, two software and Web developers, an engineering support worker, and a customer support worker from an IT-solutions company. The researcher specified the group of interviewees who appeared most relevant to the study, based on purposive sampling. The theoretical sampling is a form of purposive sampling (Patton 1990). Purposive sampling can be considered the first data collection step by identifying specific groups of people who either possess characteristics or live in circumstances relevant to the social phenomenon being studied, and then the subsequent participants are selected based on the emerging issues. Those participating staff members were selected from more than one organization because staff issues were expected to arise in commercial companies that would not be experienced in IT-provider companies responsible for developing e-commerce applications. The units of analysis in the two cases were the participants' perceptions and viewpoints on the security of e-commerce websites. Data were also collected from other sources. For example, some participants referred to two scanned websites and documents. Specifically (B2C) and (C2C) e-commerce websites, and four documents were provided by the participants, the first related to the achievement of an organization in introducing the new systems in their website, the second related to the architecture and components of the secure electronic payment system developed by an IT solution provider, and the third and fourth related to e-commerce and e-government policies and initiatives in Jordan.

Case Study Protocol

A case study protocol proposed by Yin (1994) was also prepared by the researcher before the data collection phase and was developed through data collection as a response to new emerging issues. Table 2 shows the case study protocol, including sample questions.

Table 2: Case Study Protocol

Objective of the research

The main aim of this research is to investigate the factors that influence the effectiveness of e-commerce security in Jordan, and its focus is on the perception of security from the customer's viewpoint, from that of the organization in respect to customers' security concerns, and from IT and business managers' perspectives concerning the managerial and technical implementation of secure e-commerce websites. To obtain in-depth and relevant information on the research questions, a series of semi-structured interviews will be conducted, affording the informants the opportunity of supplying their opinions, knowledge, and experiences on a wide range of issues.

The key issues of the research are:

1. Identifying customers' perceptions of security on e-commerce websites.
2. Identifying the managerial and technical considerations for implementing secure e-commerce websites.

The main research question is:

What are the factors and their interrelationships that influence the effectiveness of e-commerce security in Jordan?

Field note

The fieldwork of this research took place in Jordan. The researcher obtained initial consent to meet key people from IT provider companies who were responsible for developing e-commerce applications and businesses managers of companies which had an e-commerce website; besides these, a group of Internet users was interviewed. The interviews were conducted in two cycles.

Interview guides

- The researcher will inform the interviewees of the time and date of the interviews.
- The researcher will start with a brief introduction to the company and the informants.
- The researcher will show participants the objectives of the research and explain that the data are being gathered only for scientific purposes.
- The researcher will use an audio-recorder and take written notes during the interview.
- The researcher will seek the permission of the informants to record the sessions.
- At the end of each interview, the researcher will summarize the issues discussed and ask the informants to comment on what they have said, if that is possible.



Customers' questions

- In your opinion, is using the Internet for buying products safe and secure? Why/why not?
- Do you feel confident in the security of e-commerce transactions? Why/ why not?
- What does security on e-commerce websites mean to you?
- What security features do you think should be required on e-commerce websites?

IT and business managers' questions

- Do you think that people accept e-commerce as a secure channel for buying and selling? Please explain your opinion—how and why?
- Can you tell me what security procedures/techniques/technologies should be followed and used in order to build and develop secure e-commerce websites?
- Do you take the customer's viewpoints and perceptions into consideration when developing e-commerce websites? Why? How?
- In your opinion, what are the concerns of customers regarding whether a website is secure or not?
- Is security in e-commerce websites considered as an enabler for your business? How?

Application of Grounded Theory Procedures

The researcher has identified concepts and categories through applying constant comparative analyses between segments of data and the continual asking of the question, what does this piece of data mean? The following provides examples which show how the data has been analyzed. For example, an interview, conducted with a customer, was transcribed by the researcher. The analysis of this interview started with transcribing the recording and then converting the voice dialogue into Arabic text, which was the language of the conversation. Then the researcher translated the Arabic into an English version. The researcher asked two people, both native Arabic language speakers, to check that the two versions, Arabic and English, had identical meanings. After that, the actual analysis started, with the author reading through the text line by line, and labeling significant words or key points. For instance, when the researcher asked the customer the question, "In your opinion, is using the Internet to purchase products safe and secure, and why?" The participant responded:

"It depends, if the website that you would like to buy from gets the trust from the people ... and if you hear that people use a certain website and gain satisfaction and the website is good, then I think I would do it."

In this short excerpt, specific keywords were highlighted through underlining, which represents a certain code. The researcher reviewed the underlined keywords, such as "gets the trust from the people" and "hear that people ... gain satisfaction," and asked himself: What do these mean or represent, what is the viewpoint of the customer, are these codes important, do these codes provide insight into the researched questions, and what interpretations can be extracted from these codes? It can be identified, from this excerpt, that there is one important concept—trust, where the concept is itself a code phrased by the customer. The researcher's experience and knowledge of previous literature guided him directly to the importance of this concept, and, therefore, he highlighted it as significant. The other concept is "people's experience." This concept is extracted and understood from the excerpt, "hear that people ... gain their satisfaction." The researcher initially proposed the concept of "people's experience" as a concept that could signify that users depend on other past experiences, and recommendations from others, when using certain websites; they would also use these when deciding whether a website was secure or not. Throughout this process, it appears that there are similarities in concepts that can be grouped under one category. For instance, from the same interview, the concepts "reputation" and "commendation from people" have both also emerged from collected data. At this point, the researcher found that these codes, namely "trusted from people," "commendation from people," and "reputation" have similarities; thus they have been grouped under one category. The researcher also chose "intangible features of security" to name the category. Intangible features of security are not seen on the specific website and cannot be directly checked by users of a website. Intangible features are constructed by informal word-of-mouth communication among people. The researcher continued this process until all possible concepts and categories were identified, and this resulted in the open coding stage being completed.

The next stage in the process is axial coding, through which relationships between categories are identified. For example, the social communication category causes and constitutes a perception of tangible (security certificates)

and intangible (reputation) security features. This relationship has been identified in the data also. Thus, a participant pointed out:

“I hear that a padlock at the bottom of the page means ‘this website is secure’ but I can’t tell you if this actually is secure or not, but the main thing for me is what other people say.”

The above example demonstrated that people depend on what they hear from others when evaluating whether a certain website is secure or not. For example, past experiences with certain websites, success stories, and informal word of mouth between individuals will encourage other people to try buying via e-commerce, and because of recommendations, concerns over security and credibility of a particular website will be quelled.

At the axial coding stage, the concepts were refined and repetition reduced. More than one participant (i.e., customer) mentioned the same concept about websites: trust, reputation, recommendation/commendation of the website. The concepts and categories were also reassembled and sorted. For example, tangible security features and intangible security features were grouped together under one category named “tangible and intangible security features.”

At the final stage of selective coding, the researcher elicited the core category that was mentioned frequently by participants (customers and organizations’ staff alike), whether implicitly or explicitly. Additionally, this core category links to other categories and represents the main area of the researched problem. The core category in the present research is “cooperative responsibility.” Cooperative responsibility means that the success of e-commerce regarding security involves the responsibility of different entities (public sector, private sector, government, universities, media, banks, users, e-commerce websites, and business personnel, including IT managers, security auditors, and top management) that are complementary to each other rather than a single responsibility.

At this stage, the research model was constructed at a high level of abstraction. Table 3 shows the resulting concepts, categories, and interrelationships among them (results of open, axial, and selective coding).

Table 3: Categories, Concepts, and Interrelationships

User’s/customer’s characteristics	<i>User’s experience, knowledge, practice, learning, and experimentation</i>
Tangible and intangible indicators of security	<i>Padlock, security certificate, security policy, acknowledgment via email, third party symbols, physical address, brief description of the security issues that the customer should be aware of on the website, known identity (company has a physical building, e.g., bank and contact details), support password system, well-known electronic payment gateway such as PayPal, famous, international, well-known, trusted, formal website, respected company, large size, reputable, rating scheme</i>
Psychological aspects of security	<i>Fears, preconceptions, issues related to the nature of e-commerce and behavior</i>
Cooperative responsibility	<i>Cooperative responsibility is the core category which resulted from the data, and it is this factor which appears to link all other categories, combining customer and organizational perspectives</i>
Social communication	<i>Consists of others’ experiences, reports of past successes and failures stories, word of mouth, media</i>
Management commitment	<i>Fund expenditure, policy, training, continuous development</i>
Implementation concerns	<i>E-commerce and security infrastructure, security technology, security practices, and security during the process of e-commerce system development</i>
Interrelationships	
<ol style="list-style-type: none"> 1- Cooperative responsibility (core category) drives the effectiveness of security in e-commerce through cooperation between the entities involved (i.e., user, management, government, and banks). 2- Social communication constitutes and causes positive and negative psychological aspects of security. 3- Social communication constitutes and causes positive and negative perceptions of intangible security indicators. 4- Social communication constitutes and causes positive and negative perceptions of tangible security features. 5- Users’ characteristics constitute and cause positive and negative psychological reactions to security. 6- Users’ characteristics constitute and cause positive and negative perceptions of tangible security features. 7- Management commitment supports implementation concerns. <p>The categories and the interrelationships between them represent the resulting research model.</p>	



Second Round of Data Collection

The interview questions set out in the case study protocol were developed continually as a result of new and interesting ideas emerging from the interviews, such as security in Electronic Payment Gateways (EPG) and outsourcing, responsibility issues, and intangible indicators of security that influence customers' perceptions.

Data Saturation

The procedure adopted to decide when to cease collecting data, called data saturation, depends on three dimensions. Under the first, the researcher continued the interview process until the data that were being gathered consisted largely of repetition, with no new ideas emerging and no new insights gained. The second criterion was based on the research questions: once the results and findings were deemed sufficient to answer these questions, then the research objectives could be considered to have been fulfilled. In addition, by using theoretical sampling, i.e., by interviewing the key relevant participants, the quality of the data collected was enhanced. The researcher attempted, in advance of collecting data, to meet the key people with experience and knowledge of the study issues.

Research Evaluation

The research process was evaluated based on the following criteria:

Credibility. The subjects of the research were specified, as were the units of analysis; perceptions and viewpoints of customers and IT staff and managers were identified and investigated. The sampling was theoretical and purposeful, rather than statistical, and based on relevancy to the research. The selection of participants was designed to deliver the research objectives. The researcher contacted the interviewees two months before the actual meetings and conducted electronic correspondence with the companies involved and the individual participants. Examples of corresponding emails were kept in order to increase the research credibility. The researcher spent time collecting data from the field, interviews were recorded on tape (wherever possible) and detailed notes were taken, and data were collected from multiple sources: interviews, documents provided by the participants, and websites ($n = 2$) of the companies, whose security features were examined to see whether they were consistent with the evidence gathered during the interviews (triangulation). The researcher checked the informants' responses for new emergent issues; for example, the security of EPG was discussed in the subsequent interviews with other informants to explore the issues arising from multiple evidences. The case study protocol was also defined. Furthermore, the researcher asked two people, both native Arabic language speakers, to validate that the Arabic and English texts have identical meanings.

Transferability. The author set out in detail the procedure that was followed in the research, from defining the research questions, through the choice of the research paradigm, including the methods and techniques, to the findings and the results, so that another researcher could apply the same procedures and might obtain the same results. Nevertheless, the generalizations made are to concepts and theories, not based on statistical generalization. The study has identified new concepts and relationships, so that although the results arise specifically from the Jordanian context, similar research could produce the same results or extend it to new concepts if it were conducted within the same context and followed the same procedures. As stated by Whalsham (1998), the generalizability in interpretive research involves developing theories and concepts and drawing out implications. Strauss and Corbin (1990) also state that the purpose of grounded theory is to build theory. Its generalizability is partly achieved through a process of abstraction: the more abstract the concepts, the wider is the theory's applicability (Strauss and Corbin, 1990). The categories in this research were conceptualized at a high level of abstraction, as shown previously (see Table 3), therefore might be transferred to another context.

Dependability. The research process has been set out clearly—in particular how the case study and grounded theory method were combined, justified, and used for data collection and analysis—so the methodology can be depended on and adopted by future researchers, as it was tested by empirical research.

Conformability. Samples of the participants' responses have been presented in this research to show how the concepts were extracted from the transcribed text and then how these were assembled to form the categories, which shows how each category is relevant and grounded in the data. Thus, a sequence of steps was followed to confirm that the results are based on the data and that the emergent concepts and categories were based on the meanings assigned by the informants themselves. The concepts are also seen to be interrelated in a systematic and reasonable way by the application of constant comparative analysis to the data.

RESEARCH DISCUSSION

This paper justified the use of Straussian GT in combination with case study strategy to construct a methodology. It showed that there are weaknesses in case study research and grounded theory when they are used separately, which justifies the need to integrate both to improve the weaker aspects of the other. This integration helps to

achieve more rigorous research, and this point was supported by Patton (2001, p. 247) when he stated that "triangulation strengthens a study by combining methods." However, it was highlighted by this paper that only Straussian GT can be integrated with case study. The reason is that the Straussian approach to grounded theory is considered a qualitative research method, not a methodology. This means that it can be combined with other methods like case study. In contrast, Glaser considers grounded theory as a complete research methodology that can be used entirely on its own. In addition, Glaserian GT rejects the idea of reviewing the literature and this contradicts its use with case study. As was highlighted by Eisenhardt (1989), it is important for researchers to recognize that it is impossible, even in the case of theory-building research, to start with a clean theoretical base. This is compatible with Strauss, but not Glaser. Glaser states that "there is no need to review any of the literature in the substantive area under study" (Glaser 1992, p. 31). These reasons invalidate the use of Glaserian GT with case study, as done by Fernández et al. (2002) and Fernández (2005).

A practical implication of this research is that IS researchers need to be clear from the beginning about their approach to grounded theory, and that the Straussian approach should be followed when it is combined with case study. The proposed methodology discussed in this paper gives researchers step-by-step help on how to use these two methods together. However, although this paper advocates the integration of grounded theory and case study to establish a methodology, a researcher may encounter the following potential pitfalls which need careful attention when applying the proposed methodology in the fieldwork: (1) If the initial literature/constructs are imposed through data collection and analysis, then the aim of the research moves from theory generation to theory testing. (2) If the researcher has identified issues within the case and was unable to discover them outside the scope of the case, then the theoretical sampling is not applied appropriately, as emergent issues that require further exploration outside the bounded case are neglected or not explored. (3) If data that emerge from the case study are not saturated, where the researcher was restricted by that selected case, then data saturation will not be fulfilled. Rather, data require saturation across cases.

CONCLUSION

This paper has provided a theoretical development in methodology. In particular, it has justified the use of Straussian GT in conjunction with case study research, under interpretive assumptions, as a methodology, by showing how the elements of case study and grounded theory are compatible. In addition, it highlighted the similarities and differences between case study and grounded theory (Straussian GT). This paper has also provided an example of applying the proposed methodology to research that has been conducted in the area of security perception of e-commerce. It showed step-by-step how the methodology procedures and elements were applied to the research. Applying the proposed methodology has resulted in combining the factors and their interrelationships that influence the effectiveness of e-commerce security from the perspectives of customers and IT and business personnel. The current research highlighted some pitfalls that researchers could face when applying the methodology, which need careful attention. Further research can apply the same methodology in any area of IS research and provide additional insights and implications for its success or for challenges encountered in its application.

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