CHAPTER III
REVIEW OF LITERATURE

3.1 INTRODUCTION

In the last decade, a considerable amount of financial resources have been allocated to the implementation of e-governance projects. In the early years, projects primarily had a technological focus. This was due to the belief that organizations’ behavior and performance could be changed and improved by simply infusing technology. Over the years, the high rate of IT project failures prompted many to acknowledge the limits of this approach. The interaction between people and technology is a complex phenomenon involving rational as well as emotional factors. Failing to acknowledge the importance of understanding the underlying attributes of human-computer interaction may endanger the success of IT projects in e-governance. Recently, both academicians and practitioners have turned their attention to the organizational aspects of IT projects. And while the process of technology acceptance has been widely studied in the private sector, it has been relatively overlooked in the e-governance field.

With the emergence of technology and growing demand of the society, e-governance became a key issue and developed nations started adopting it to better serve their citizens through efficient and effective services, with accountability and transparency. When appropriately applied, e-governance can effectively improve the over-all functioning of an university, too. The underlying goals for adopting e-governance
practices are to ensure improved quality in disseminating education and administration, conforming to regulations as per the university statutes and acts.

Traditionally, the effectiveness of governance can be measured through the extent of the responsibility of the governments to the citizens. In what concerns this item, it should, however, not be neglected the way the power of the governance is exercised, as well as the way the citizens express their opinion, and the way the decision-making operates in different public fields (Keefer, 2004). In this sense, the governance models embrace public institutions and processes of decision-making that not only include the citizens but also demand for a growing civil participation.

The exercise of a governance model must include independent but interconnected units, whose activities should be clear, accountable, responsible, and especially regular in order to reduce the inequalities in terms of access to the services that are made available by public institutions. The most of the entrepreneurial governance plans of the Nations in general and public institutions in particular, should make use of the broadest spectrum of electronic platforms possible in order to guarantee greater levels of public services governance, taking into consideration the intrinsic potential of using ICT.

An ideal model of e-governance can be executed by the implementation of four main dimensions (Leitner, 2003): (i) Adaptation and coordination of the public policies; (ii) Participatory democracy (of the most representative players in what concerns to the services supply); (iii) Creation of cooperative networks (for the implementation of
public policies for development); (iv) Access to clear and open informative systems of governance.

According to Klazar et al. (2005), the users of e-governance services can be classified into five basic groups: (1) The non users of the Internet service (to obtain information or transact with the Government); (2) The Transactors (that make payments by credit card or banking transference); (3) The Suppliers (that supply personal information or household information to the Government); (4) The Information Seekers (that use Internet to obtain information from a website of the government); (5) The Consultants (that use Internet to express a point of view or to participate in a public consultation process).

In the opinion of Backus (2001) the formal mechanisms of e-governance should be more than the creation of an online presence. These mechanisms include the use of electronic tools that simplify operations and procedures according to the following aims: (a) to create interaction between the government and the citizens; (b) to establish interrelations between the government and the units of business; and (c) to manage internal operations of the government in a more efficient way.

According to Goddard et al. (2006), the universities have played a strategic role in the economic and social development of the country and of the regions where they are located. The university is a relevant actor in the social system, in what concerns the development of human capital, through the supply of new professionals that have
universalistic skills which provide a better identification of social and economic responsibilities.

The concept of governance applied to the university is related to the exercise of controlling the power of different centers and departments which are part of the university. This kind of exercise is based on the drawing of an adequate system which executes different levels of institutional and relational power. These are integrated in a model of electronic governance (e-governance), which is structured in different Internal Information Systems (IIS).

Those systems make use of data warehouses that consist of information that is extracted from the users’ profile. The full operation of these new digital e-governance platforms implies the transposition of e-business models into the institutional organizational and relational networks of the universities.

Universities and colleges routinely use ICT and e-governance for many administrative and support tasks, such as payroll and marketing, and specialist activities such as scientific research. Until recently, this was less true of its use in their core activity of teaching and learning (Collis, 2002; Oliver, 2005).

Universities and colleges could not function without ICT, which is ubiquitous for administration, communication, information gathering and research. A survey report stated that there would be great use of ICT application over the next 3-5 years, and
30% of the respondents thought that it would rise a great deal (James and Hopkinson, 2008d).

Some ICT applications also have a potential ‘social overhead’ (Anderson, Brynin, Raban & Gershuny, 2006). They can potentially support a ‘surveillance society’, which erodes or compromises privacy (Crainer, 2008) and/or an atomized social world in which meaningful human interaction is replaced with less satisfying or inclusive virtual relationships (Wilsden, 2001). Within education, they could create or exacerbate divisions because of different levels of use.

The individual elements of a university’s or college’s ICT activities form part of an ‘enterprise architecture’ (Anderson and Backhouse, 2008; American National Standards Institute/Institute of Electrical Electronics Engineers, 2008). This has four dimensions:

1. Business – including high-level objectives and goals, and key processes, functions and structures
2. Applications – the ICT-based services that support the business processes, and the relationship between them
3. Information – the creation, use, storage and management of the data that is used in applications, and
4. Technology – the hardware and software supporting the organisation, including desktop and server hardware; operating systems; and network connectivity components (Platt, 2002)
3.2 THEORIES

Researchers in the area of Information Systems and Information Technology are interested in investigating the theories and models that will have power in predicting and explaining behaviour across many domains. Each prominent technology acceptance theory or model which has not been superseded by more recent research has different promises and benefits. It is therefore important to study them intentionally, since it is expected that theoretical concepts from these theories will help to provide a sound basis for the theoretical framework for creating a research model that could properly demonstrate the acceptance of Technology for this research.

In this regard, this chapter reviews the literature in relation to four prominent technology acceptance theories/models according to the research objective. It includes (1) Innovation Diffusion Theory (IDT), (2) Theory of Reasoned Action (TRA), (3) Technology Acceptance Model (TAM), (4) Technology Acceptance Model 2 (TAM2). In addition, the literature about IT adoption and usage are examined. The many diverse theoretical perspectives from previous studies enabled a comprehensive understanding of individual acceptance of technology used, to formalise the theoretical framework for this study.

3.2.1 INNOVATION DIFFUSION THEORY

The original diffusion research was done as early as 1903 by the French sociologist Gabriel Tarde who plotted the original S-shaped diffusion curve. Tardes' 1903 S-shaped curve is of current importance because "most innovations have an S-shaped
rate of adoption". (Rogers, 1983) The variance lies in the slope of the "S". Some new innovations diffuse rapidly creating a steep S-curve; other innovations have a slower rate of adoption, creating a more gradual slope of the S-curve. The rate of adoption, or diffusion rate has become an important area of research to sociologists, and more specifically, to advertisers.

In the 1940's, two sociologists, Bryce Ryan and Neal Gross "published their seminal study of the diffusion of hybrid seed among Iowa farmers" renewing interest in the diffusion of innovation S-curve. The now infamous hybrid-corn study resulted in a renewed wave of research. "The rate of adoption of the agricultural innovation followed an S-shaped normal curve when plotted on a cumulative basis over time". This rate of adoption curve was similar to the S-shaped diffusion curve graphed by Tarde forty years earlier.

P. Lazarsfeld, B. Berelson, and H. Gaudet (1944) define the Innovation Diffusion theory as communicators in society with a message influence/encourage people that have strong opinions through the media to influence the masses.

This theory which was defined by Everett Rogers in a book entitled Diffusion of Innovations first in 1962, and the model explains the process by which innovations in technology are adopted by users. It is the study of how, why and at what rate the new ideas and technology spread through cultures. He defines an innovation as “an idea, practice or object that is perceived as new by an individual or other unit of adoption”
and Diffusions defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system”.

Diffusion on Innovation theory sees innovations as being communicated through certain channels over time and within a particular social system (Rogers, 1995). Individuals are seen as possessing different degrees of willingness to adopt innovations and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Rogers, 1995).

Peter Denning defines innovation as ‘a transformation of practice in a community’ (Denning 2004). According to Newell and Turner (2006) “Innovation means change: sometimes radical change and sometimes incremental change” (Melanie Bates 2007). Diffusion theory is valuable to the field of educational technology for several reasons (Surry 1997). The causes of educational technology’s diffusion problems remain unclear. Educational technology is an innovation based field in which the various products and methods used to represent innovations in the form, organization and delivery of instruction. By studying diffusion theory, it is possible to come up with a model for adoption and diffusion of educational technology. Diffusion theory provides important guidance for those interested in seeing educational technology adopted within all levels of the educational system.
3.2.2 THEORY OF REASONED ACTION

Drawn from social psychology, the Theory of Reasoned Action (TRA) is one of the most fundamental and influential theories of human behavior, derived from previous research that started out as the theory of attitude, which lead to the study of attitude and behavior. It has been used to predict a wide range of behaviors. (Fishbein and Ajzen 1975).

The TRA model was found to strongly positively influence the adoption of the deep processing construct, and to strongly negatively influence the adoption of the surface processing construct.

TRA posits that individual behavior is driven by behavioral intentions where behavioral intentions are a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior.

Attitude towards the behavior is defined as the individual's positive or negative feelings about performing a behavior. It is determined through an assessment of one's beliefs regarding the consequences arising from a behavior and an evaluation of the desirability of these consequences.

Subjective norm is defined as contribution of the opinion of any given referent is weighted by the motivation that an individual has to comply with the wishes of that referent.
3.2.3 THEORY OF PLANNED BEHAVIOR

Theory of Planned Behavior (TPB) is the extended edition of TRA, where another construct called perceived behavioral control, which predicts behavioral intentions and behavior, is included in it. (Armitage and Christian 2004)

Ajzen and Fishbein formulated in 1980 the theory of reasoned action (TRA). This resulted from attitude research from the Expectancy Value Models. They formulated the TRA after trying to estimate the discrepancy between attitude and behavior. This TRA was related to voluntary behavior. Later on behavior appeared not to be 100% voluntary and under control, this resulted in addition of perceived behavioral control. With this addition the theory was called the theory of planned behavior. The theory of planned behavior is a theory which predicts deliberate behavior, because behavior can be deliberate and planned.
3.2.4 TECHNOLOGY ACCEPTANCE MODEL

In 1986, Fred Davis developed the TAM foundation to explain how and when users decide to accept and use of a technology. Based on the Theory of Reasoned Action (TPB, Ajzen, 1991) which is a specific adaptation of those social psychology theories predicting specific behavior to understand user adoption behavior of Information Technology. TAM uses two sets of specific behavioral beliefs, perceived usefulness (PU) and perceived ease of use (PEOU), to predict system usage. PU is outcome expectancy, while (PEOU) is process expectancy (Venkatesh, 1999). Intentions to use have been found to be a good predictor of the actual system usage and can be used as a dependent variable (Venkatesh & Davis, 1966). Thus, behavioral intention is the function of the user’s beliefs about ease of use of usefulness. Furthermore, PU is influenced by PEOU, in that the easier a technology is to use, the more useful it seems to be, holding other conditions constant. Venkatesh, Morris, Davis and Davis
extended TAM, building a new model called Unified Theory of Acceptance and Use of Technology (UTAUT), which helps managers assess the likelihood of technology success as well as understand the drivers of technology acceptance.

TAM has been found to have similar or greater explanatory power to that of other models, such as TRA and TPB. Davie et al. (1989) found mixed results when comparing with TAM and TRA. Mathieson (1991) compared TAM to the TPB and found that both models effectively predicted intentions to use, whereas TAM was slightly better for an empirical perspective. However, as technology has continued to change, many extensions of TAM have been proposed. (Gefen and Straub 1997; Gefen and Keil 1998; Venkatesh and Davis 2000).

TAM has been used worldwide in the business, information technology and education settings. Many researchers have tested, replicated, and extended TAM with additional constructs (An, 2005; Cheung & Huang, 2005; Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Drennan, Kennedy & Pisarki, 2005; Harrison & Rainer, 1992; Straub, Igbaria, Schiffrin & Wieckowski 1994; Ilgbaria, Zinatelli, Cragg & Cavaye, 1997; Limayem & Karahanna-Evaristo, 1995; Lu, Yu, Liu & Tao, 2003; Malhotra & Galletta, 1999; Thompson, Higgins & Howell, 1991; Taylor & Todd, 1995; Venkatesh, 2000; Venkatesh & Davis, 1996; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000). Therefore, TAM has been developed over time within different populations, and with various technology systems.
TAM has been widely applied and empirically supported; there are studies trying to explain the individual adaptation behavior of online retailing using TAM as well. In a web survey, TAM is found to be a valid theoretical framework (O’Cass & Fenech, 2003). In another study of online customers, a variable of compatibility from innovation diffusion theory was added and was hypothesized to affect perceived usefulness and attitude toward using. Data analysis found support for the TAM core elements as well as for compatibility (Chen, Gillenson & Sherrell, 2002).

In information system research, a user’s attitude toward technology is addressed in the TAM (Davis, 1989; Davis et al., 1989). Due to its parsimonious nature and highly reliable constructs, TAM has been widely adopted in the research of user acceptance of technologies such as word processors (Davis et al., 1989), spreadsheet applications (Mathieson, 1991), e-mail (Szajna, 1996), and Web sites (Koufaris, 2002).

Hubona and Geitz (1997) reported, perceived usefulness and perceived ease of use have sound theoretical foundations. They are therefore widely accepted as valid and predictive measures of future web usage levels. TAM yields highly consistent results in the acceptance behavior of the users towards new systems.

In the past ten years, there have been more than hundred studies that have used TAM as a theoretical framework that addressed technology acceptance issues. Twenty eight of those studies have been reviewed in the literature review.
The literature review shows that there are many attempts to evaluate, integrate, and extend different models and approaches for analyzing the implications of the TAM theory. Different researchers have adopted different measures for technology in order to understand its usage. The different measurements criteria for evaluating technology usage included looking at technology as an entertainment tool (online games), a task-oriented tool (software for increasing organization productivity), a learning tool (software for educational purposes) and an information-seeking tool (Internet). The contribution of the past research studies are the revision and extensions of TAM theory to explain the usage of different technological tools. The main limitation of these studies is that the sample of the research does not allow generalizing the findings to broad sectors of technology users in general and public sector employees in particular.

The goal of TAM is to provide an explanation of the determinants of computer acceptance that is in general capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified, it incorporates findings accumulated from over a decade of IS research, it may be especially well suited for modelling computer acceptance (Davis, Bagozzi & Warshaw 1989).
Technology acceptance model (Davis, Bagozzi & Warshaw, 1989: 985).

In order to comprehensively understand individual acceptance of technology, we need to interpret user behaviour within at least three contexts: technology (system) context, individual context and organisational (implementation) context, where a context refers to the interrelated conditions in which something exists or occurs (Webster 2006).

3.2.4.1 TECHNOLOGY CONTEXT

Technology (system) context refers to the end-user computing technologies under investigation, such as any IT innovations, information system applications, and communications technology. The technology context defines the factors of a technology and their effects on usage behaviour. Technology factors include usability, interface, interaction style and quality. For Internet technologies characteristics of web-page design, response time, and information location on the web have been
tested in empirical studies. For communications technologies, factors such as system social presence and information richness, and system accessibility have significant impact on user’s beliefs about using the technology.

A great number of researchers have studied the acceptance of technology based on TAM and other theories (such as Diffusion of Innovation theory, Theory of Planned Behaviour, Decompressed Theory of Planned Behaviour and Social Cognitive Theory) across a wide range of IS applications and other contexts. Examples include:


2) Other communication technologies such as customer dial-up systems (Subramanian 1994).

3) Key office IS applications, such as the spreadsheet lotus 1-2-3, WordPerfect, Word, Excel (Adams, Nelson & Todd 1992; Branchau & Wetherbe 1990; Brosnan 1999; Chau 1996; Doll, Hendrickson & Deng 1998; Hendrickson,


8) Mobile commerce services (Pederssen, P.E. & Nysveen 2003; Pedersen, P.E, Nysveen & Thorbjornsen 2003; Pederson 2002).

9) Others such as DSS Software (Chiasson & Lovato 2001), CASE tools (Wynekoop, Senn & Conger 1992), financial EDI (Teo, Tan & Wei 1995), Internet Banking (Sukkar & Hasan 2005), e-learning (Ong & Lai 2006; Roca, Chiu & MartÃnez 2006), and e-commerce (Pavlou & Fygenson 2006).

**3.2.4.2 INDIVIDUAL CONTEXT**

Individual context refers to those essential characteristics of individual users that are related to technology usage. An individual may exhibit characteristics completely different from others in other organisations from different cultures. Individual differences refer to user factors that include characteristics such as personality and demographic variables as well as personal factors that account for differences attributable to circumstances such as experience and training (Agarwal & Prasad
A large number of researchers used the following subjects in studying technology acceptance. For example:

1) Faculty members (Durrington, Repman & Valente 2000; Dusick 1998).
2) MBA students (part-time, full-time, and professional) (Agarwal & Prasad 1997; Davis 1989; Venkatesh & Davis 2000).
6) Online users (Koufaris 2002).

3.2.4.3 ORGANISATIONAL CONTEXT

Organisational (implementation) context refers to the specific environment where the individual works and the investigated technology acceptance takes place. The decision to adopt a technology of individual users is secondary; the first decision belongs to organisations in making decisions to adopt that technology. In order to increase the user’s acceptance of technology, organisations have to create a favourable environment to support and encourage usage of technology at work. The organisation’s computing policy, management support and encouragement are empirically proved to be very important (Han 2003).
Training programmes for specific user groups help users to increase their knowledge about the technology so that they are more likely to have a positive intention to use it in their work. Cooper (1994) found that the role of organisational culture was significant in new IT implementation. Interpretation of the model of technology acceptance in the organisation context will help us examine the effects of organisational factors on individual behaviour. Measurements or factors that increase user acceptance in one organisation may not function well in another organisation. Organisational factors can assist and affect faculty members or academics’ decision to use and adopt electronic technologies in instruction, for example, as physical resource support and mandate from the university (Medlin 2001). Other important organisational factors from research on computer use in education are (1) resources, such as time, training, human support services, and access to the technology and (2) group norms and values of collaboration and collegiality. It has been found that different tasks were influenced by different organisational factors (Chiero 1997).

Similarly, there are a number of environmental factors that influence a faculty member’s choice to use or not to use computers for instruction: (1) a supportive administration, (2) availability of computers in the classroom, (3) support and sharing of resources, (4) a strong support staff, and (5) training (Dusick 1998; Fulton 1998). The studies of technology acceptance have been conducted in various types of organisations, for example:

2) Universities in other countries (Hong et al. 2001-2002).


4) Hospitals in other countries (Chau & Hu 2001, 2002b; Hong et al. 2001-2002).

5) Agricultural system such as dairy farming in New Zealand (Flett, Alpass, Humphries, Massey, Morriss & Long 2004).

3.2.5 EXTENSION OF TECHNOLOGY ACCEPTANCE MODEL (TAM2)

The researchers suggested that integration of TAM with other IT acceptance models or incorporating additional factors could help to improve the specificity and explanatory utility in a specific area. (Venkatesh and Davis 2000)

Furthermore, Venkatesh and Davis (2000) developed and tested a TAM2 model by including a number of determinants to Perceived Usefulness into the new model. It is a theoretical extension of the TAM that explains PU and Usage Intentions in terms of social influence processes (Subjective Norm, Voluntariness and Image) and cognitive instrumental processes (Job Relevance, Output Quality, Result Demonstrability and Perceived Ease of Use).
The TAM is a useful theoretical model in explaining, identifying, and predicting an individual’s acceptance of new information technology. It has been used extensively in the areas of technology information systems and education (Cheung & Huang, 2005; Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Drennan, Kennedy & Pisarki, 2005; Harrison & Rainer, 1992; Lu, Yu, Liu & Yao, 2003; Straub, Limayem & Karahanna-Evaristo, 1995; Szajna, 1996; Venkatesh, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000).

3.3 CONCEPTUAL FRAMEWORK OF THE STUDY

A theoretical framework is defined as a collection of theories and models from the literature which underpins a positivistic research study (Hussey & Hussey 1997). In other words, it is a conceptual model of how the researcher theorises or makes logical
sense of the relationships among the several factors that have been identified as important to the problem. Developing such a conceptual framework helps us to postulate or hypothesise and test certain relationships and thus to improve our understanding of the dynamics of the situation. In total, the theoretical framework discusses the interrelationships among the variables that are considered important to the study. It is essential to understand what a variable means and what the different types of variable are. After the theoretical framework has been formulated, then hypotheses can be developed to examine whether the theory formulated is valid or not (Sekaran 2003). In conclusion, the theoretical framework may be referred to as a conceptual framework or as the research model. These three terms are used interchangeably in this research.

Some previous researchers focused on individual acceptance of technology by using intention and/or usage as the key dependent variables. It is very important to make a decision before conducting research relating to the time horizon of the study.

The models of technology acceptance which were original developed and surveyed could concentrate either on behaviour intention or usage behaviour or both behaviour intention and usage behaviour depended on the time horizon of their study (a cross-sectional study versus a longitudinal study). For a cross-sectional study, data are gathered just once, perhaps over a period of days or weeks or months. On the other hand, in a longitudinal study data on the dependent variable are gathered at two or more points in time (Sekaran 2003).
From previous research in the case of a cross-sectional study, if the technology had never been introduced before or had just been introduced recently and individuals had no experience about the technology or were in the early stage of experience with very few users of the technology at that time, usually, only behaviour intention was measured.

In contrast, if the technology had been introduced for quite a period of time, the actual usage behaviour was usually measured, more specifically in the cross-sectional study. In the case of longitudinal study in association with a new technology, behaviour intention to use was captured before actual usage behaviour was measured.

The basic concept underlying the user acceptance model of this research adapted from Venkatesh et al. (2003) suggests that individual reactions to use the Internet may influence actual usage of the Internet and consequently, actual usage of the Internet may influence intentions to use the technology. It is expected that a research model, based on this concept after some tests and modifications (if necessary), could have power in explaining usage behaviour and could predict future usage based on user’ intention to use the Internet.
3.4 PROPOSED MODEL OF TAM2

Proposed TAM2 Model


The proposed research model comprised of two core constructs (independent variables). These variables are perceived usefulness (PU) and facilitating conditions (FC).

Based on the proposed research model, hypotheses will be tested:

- Whether these determinants (PU and FC) may have any significant influence on usage behavior.

3.4.1 PERCEIVED USEFULNESS

Despite the fact that perceived usefulness (PU) in TAM (Davis 1989), TAM2 (Venkatesh & Davis 2000) and Augmented TAM or Combined TAM and TPB called (C-TAM-TPB) (Taylor & Todd 1995a), was theorised as a direct determinant (a core construct) of behaviour intention, strong evidence supported that perceived usefulness
was also found as a direct determinant of usage behaviour (Adams, Nelson & Todd 1992; Davis 1989; Dishaw & Strong 1999; Gefen & Keil 1998; Gefen & Straub 1997; Hendrickson & Collins 1996; Igbaria, Parasuraman & Baroudi 1996; Igbaria et al. 1997; Lederer et al. 2000; Szajna 1994; Taylor & Todd 1995a; Teo, Lim & Lai 1999; Thompson, Higgins & Howell 1991). Perceived usefulness is analogous to the relative advantage of perceived characteristics of the Rogers’ Innovations Diffusion Theory (Venkatesh et al. 2003). From the evidence, it is a good rationale to use perceived usefulness as the direct determinant of usage behavior in this cross sectional study. Perceived usefulness (PU) is defined and used in this study as:

“The degree to which a person believes that using a particular system would enhance his or her job performance”(Davis 1989, p. 453).

3.4.2 FACILITATING CONDITIONS

Facilitating conditions were modeled as a direct antecedent of behavior intention and usage in the theory of DTPB which expected that the impact of facilitating conditions (resource facilitating conditions and technology facilitating conditions) should alert management to possible barriers to usage (Taylor & Todd 1995b). The facilitating conditions determinant (FC) was found non-significant in predicting intention but significant in determining usage (Venkatesh et al. 2003). It has been suggested that the absence of facilitating resources represents barriers to usage and may inhibit the formation of intention and usage. However the presence of facilitating resources may not encourage usage (Taylor & Todd 1995b). Moreover, it was found that facilitating conditions significantly related to the actual usage of Internet-based teaching
Limayem & Hirt 2000). The facilitating conditions determinant is defined and used in this research as:

“The degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system” (Venkatesh et al. 2003, p. 453).