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**APPLYING A MODEL OF TECHNOLOGY TRUST TO THE
IMPLEMENTATION OF A STUDENT ADMINISTRATION SYSTEM
AT A UNIVERSITY**

**J. WILHELM VAN DER WESTHUIZEN
(VWSJOH009)**

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Psychology.

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University of Cape Town
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COMPULSORY DECLARATION:

This work has not been previously submitted in whole, or in part, for the
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ABSTRACT

This study tested the generalisability of a model of *technology trust in human resource information systems* (Lippert & Swiercz, 2005) to non-HRIS system implementations. The strength and direction of the relationship of four of the ten constructs identified by Lippert and Swiercz were examined in a South African environment. The implementation of the PeopleSoft student administration system at the University of Cape Town was researched. Regression analysis showed that a very high percentage (57.6%) of the dependent variable (technology trust) could be explained by the variable technology usability. The construct, predisposition to trust, had an insignificant contribution, while organisational trust (10.7%) and organisational culture (19.1%) were the other two constructs that were researched. The relationship between technology trust and implementation success was significant with $r = +0.75$.

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Information technology today

Information technology systems

Information systems play a critical role in today's business organizations, with the interdependence between information systems and business functions growing all the time. Information systems have entered all aspects of business. The complexity and scope of current system projects and applications influence a much larger part of the organizations than in the past (Lauden & Laudén, 2000). Systems in the fifties were largely technical (simply automating procedures), while the impact of some of today's systems can be described as institutional, influencing all or nearly all aspects of an organisation. Business Process Reengineering (BRP) and Enterprise Resource Planning (ERP) implementations are examples of enterprise wide implementations. The hard borders between different functional systems for example financial-, human resource, marketing and production systems have faded due to the complexity and integration of the modern systems. This is an additional complication the modern day implementer has to deal with.

Raskino and McGee (2005) found that senior business executive's faith in technology as a change force had been restored, resulting in information technology (IT) expenditure increasing again after it decreased from 15.9% of annual costs in 2000 to 0.0% in 2003. Global business, productivity, social information analysis and the I-Generation are some of the new technological challenges facing commercial IT. The size and growth of IT expenditure combined with the impact and importance/dependence of organisations on IT makes the study of implementation success and failure a potentially critical activity in today's commercial world.

The Focus of Research on IT Implementations

Nokes (2000) found that unsuccessful implementations led to projects that exceeded their budgets and time and new systems that failed to meet user expectations or had poor reliability. They concluded that the cost, impact and consequences of IT-related projects made successful IT system implementation a critical part of all organisations. This held true for small and large implementations. The costs were not limited to implementation cost (due to schedule and cost overruns), but included maintenance and infrastructure costs. Down time due to implementation failure led to massive financial losses (Hong & Kim, 2002; Laudon & Laudon, 2000; Nokes, 2000). The impact and consequences of unsuccessful or failed IT implementations due to performance deficits and failure to achieve expected benefits are well known.

In the complex world of today's IT systems it is impossible to isolate a single cause for implementation success or failure. Laudon and Laudon (2000) have identified the following four causes determining implementation outcome,

- The role of users in the implementation process
- The degree of management support for the implementation project
- The level of risk and complexity of the implementation project
- The quality of management of the implementation process

IT systems have many stakeholders, each with a different definition of success. The developer wants a system that is consistent with specifications and functions correctly. A manager sees a successful system as cost effective, reducing uncertainty of outcomes,

lowering risk(s) and leveraging scarce resources. The end user wants a system that improves job performance without inflicting undue annoyance (Briggs, De Vreede, Nunamaker & Sprague, 2003). The wide-ranging expectations of IT system stakeholders make it difficult to define and measure system success. Laudon & Laudon (2000) identified the following measures for system success;

- High levels of system use
- User satisfaction with system
- Favorable attitudes about IS function
- Achieved system objectives
- Financial payoff

Kurupparachchi, Mandal and Smith (2002) found in their critical review of project implementation strategies that there were few serious attempts for studying implementation success factors of IT projects. They suggested that the lessons learned in project management of more "mature" disciplines like construction engineering might be applicable to complex IT projects. They shared the feeling of other authors that the success of IT projects is far more than a successful economic and technological implementation, but that the effective management of changes in a sociological context is a critical requirement for success. Customer acceptance of an IT project is therefore as important in determining the project's success as the traditional factors of budget, timeliness or technological sophistication.

Better project management has resulted in fewer IT projects failing. Reductions in project size and the limiting of complexity (Betts, 2005) have also led to a higher implementation success ratio. The improvements have not rescued IT projects from its desperate state, where only one out of four projects is successful (Whiting,

1998). Whiting quotes the Chaos study that reports that in 1998 cost overruns and project failures amounted to \$100 billion in the United States of America (USA).

Bailey and Pearson (1983) found that user satisfaction was related to implementation and system success, although there was no standard measure of user satisfaction. They created and tested a list of 39 factors affecting user satisfaction, as well as scaling an individual's reaction to these factors. The results of their model for measurement, which can be found in Table 1, was empirically tested.

Table 1

Rating of factors affecting user satisfaction.

User Factor	Rating
Flexibility	1
Accuracy	2
Timeliness	3
Reliability	4
Completeness	5
Confidence in systems	6
Relevancy	7
Perceived utility	17
Degree of training	24

They found that flexibility was the most important factor, with vendor support the least important factor in user satisfaction. Baronas and Louis (1988) found in a field experiment on interventions that enhance and restore personal control and the resulting effect on users during and after implementation, that users' perception of control had a positive correlation to users' acceptance of and satisfaction with systems.

Fink (1998) in his research of successful IT adoption in small and medium enterprises (SMEs) in Western Australia found that internal factors (i.e. IT benefits, IT availability, organisational culture, in-house IT experience and resources, IT implementation and selection) were judged to be more important than external factors (i.e. external environment, outside support, external resources).

Au, Ngai and Cheng (2002) researched different approaches to information systems (IS) success measurement. They gave an overview of end-user information system satisfaction (EUISS) evaluating its strengths and weaknesses. They proposed that based on the equity and needs theory, three new comparison referents: equitable work performance fulfillment, equitable self-development and equitable relatedness fulfillment are added to EUISS.

In a review of 20 IT and IT-related articles over the last 25 years Lapointe and Rivard (2005) found 43 articles that treated resistance as a key implementation issue. They found four articles with explanations of the causes and nature of occurrences of resistance, "Markus explained resistance in terms of interaction between the system being implemented and the context of use, Joshi used equity theory in a model wherein individuals evaluate change on three levels, Marakas and Hornik explained resistance as passive - aggressive responses to threats or stresses that an individual

associate with a new system and Martinko proposed that a new technology, internal and external variables, and an individual's experience with success and failure at tasks involving similar technologies evoke causal attributions" p.463.

They then defined resistance in terms of behaviours, the object and subject of resistance, perceived threats and initial conditions. In their research they adopted a multilevel perspective conceptualising resistance to IT as a unit-level phenomenon and focused on group resistance. Their research of resistance to the implementation of software packages at three hospitals revealed that "in the presence of mixed determinants, resistance behaviours vary in nature and intensity as implementation evolves", p.478. They also observed the existence of triggers that influence initial conditions and the object of resistance. They concluded that resistance escalates due to inappropriate responses to resistance behaviours. The object of resistance changes over time from the system (early stages) to the significance of the system or the system advocates (later stages). The initial period of a system implementation is therefore the ideal time to adopt and improve the system.

The lack of conclusive proof of the factors causing success, failure or resistance to IT implementations is a result of the complexity of IT implementations.

New Research Focus: Models for Implementation Success

Finding implementation success models

In an effort to harness the complexity of IT implementations researchers have started to build models to combine and reflect the challenges of finding the key to implementation success. In the

search for implementation success factors three models for the measurement of implementation success were found. The DeLone and McLean Information System Success Model (2003) is a well-known and proven model, Lippert have been researching the construct technology trust and its link to implementation success a while and has with Swiercz developed the Lippert and Swiercz model for technology trust (2005), while the Stone, Johnson, Stone-Romero and Markova model (2006) was introduced in April 2006.

The DeLone and McLean Information System Success Model (1992/2003)

De Lone and McLean (1992) presented the DeLone and McLean Information System Success Model (D&M Model) as a framework for measuring the complex, dependent variable, information system success. Their original model was an attempt to integrate previous research about IS success into a coherent body framework to provide guidance to future researchers (De Lone & McLean, 2003).

The model defined information system success as information quality, system quality, use, user satisfaction, individual impact and organisational impact (see Figure 1).

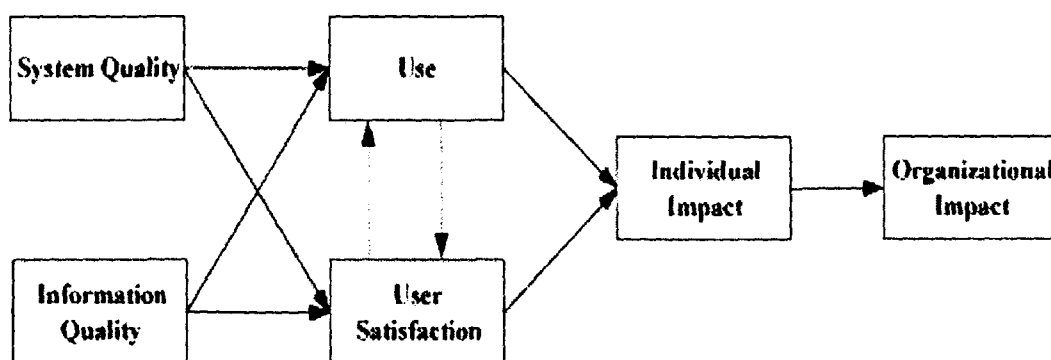


Figure 1. The original DeLone and McLean Information System Success Model (1992)

System quality measured technical success that is the accuracy and efficiency of the system. Information quality measured semantic success. Use and user satisfaction measured individual impact and organisational impact measured effectiveness success. The model was based on process and causal considerations, with the six dimensions of the model interrelated rather than independent. The temporal or process part saw IS as created with features exhibiting various degrees of system and information quality. Through using the system user are satisfied or dissatisfied which impacts on his/her work, with the individual impacts resulting in organisational impacts. The causal or variance models saw higher system quality leading to higher user satisfaction and use, leading to higher individual productivity and organisational productivity improvements.

The original model was widely used by researchers. From 1993 to mid-2002 285 papers had referenced the D&M Model. Some studies validated and did empirical testing of the model; others tested the model's associations and relationships. Several articles challenged, critiqued or extended the model. These articles contributed to a better understanding of information system success and its dimensions (DeLone & McLean, 2003).

Based on research contributions and changes in the role and management of information systems the authors decided to update their original success model in 2003. Service quality was added as a third quality dimension, now consisting of information, system and service quality. Service quality was added to accommodate the role of IS as service provider to end users, previously (before the mid 80's) IS was only seen as an information provider. Intention to use was added as an alternative and complement to use. The factors

individual and organisational impact were replaced by the factor net benefits as the “impacts” of IS moved wider to include work groups, inter-organisational, industry, consumer and societal impacts. See Figure 2 for the updated model.

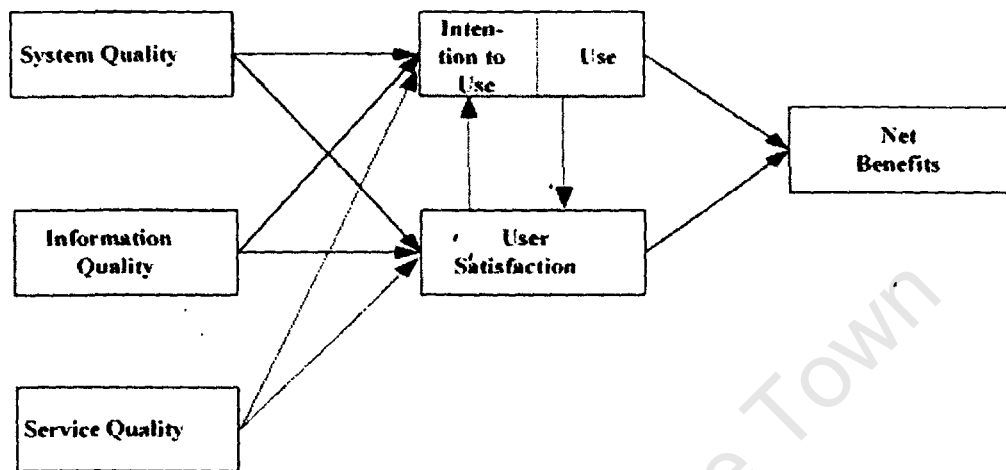


Figure 2. The updated DeLone and McLean Information System Success Model (2003)

The updated model can also be used to measure e-commerce applications, with system quality measuring availability, reliability, adaptability, and response time. Information quality measures content, while service quality measures support. Usage, user satisfaction and net benefits are easily applied to the e-commerce environment (DeLone & McLean, 2003).

The Lippert and Swiercz model of Technology Trust

Lippert and Swiercz (2001) found that the traditional reasons for implementation failure are inadequate in the face of today’s unique challenges and expanded the range of implementation success factors in response to the social and operational demands of modern day IS. The view that more attention should be paid to the human side of IT implementations is supported by Cleland, Bidanda

and Chung (2001) who found that a lack of attention to human issues in the planning stages often leads to the unsuccessful implementation of technology and recommended that equal consideration should be given to human and technical issues to realise the expected benefits of technology implementations. Lapointe and Parker-Matz (1998) also agrees with this view and argued that elements like user adoption, acceptance, training and ongoing support could be more critical as success factors than the technical aspects of a system implementation. They also stated that these elements may prove elusive and are often neglected.

Lippert and Swiercz (2005) build the construct of technology trust on the earlier work of Giffen (1967) who suggested that trust could be bestowed not only on a person, but also on a place, event or object. Muir (1987, 1994) and Muir and Moray (1996) expanded the work of Rempel, Holmes and Hanna (1985) on interpersonal trust and identified three common trust elements in their effort to understand better the nature of the trust relationship between humans and machines. The three common trust elements they identified were:

- The description of trust as an expectation or confidence.
Most definitions, across disciplines refer to trust as an expectation (Hosmer, 1995; Lewicki, McAllister & Bies, 1998; Lewis & Weigert, 1985; Mayer, Davis & Schoorman, 1995; Rousseau, Sitkin, Burt & Camerer, 1998; Sheppard & Sherman, 1998).
- The focus of trust toward a specific person, place or object;
The focus of trust is equally common in trust definitions (Hosmer, 1995; Lewicki, McAllister & Bies, 1998; Mayer, Davis & Schoorman, 1995; Rousseau, Sitkin, Burt & Camerer, 1998).
- The presence of multiple characteristics of trust referents.
The multi dimensionality of trust is not found that frequently, but is referred to by a number of researchers (Mayer, Davis &

Schoorman, 1995; Muir, 1987; Rousseau, Sitkin, Burt & Camerer, 1998).

Lippert and Swiercz (2005) identified the construct, technology trust, as an important human factor in determining implementation success of human resource information systems (HRIS). Technology trust combines "different" factors that were traditionally not combined in a model to implementation success. Combining user, technological and organisational factors, might prove to be a model that can better explain IT implementation.

In their model Lippert and Swiercz have extended the three success categories (technological, organisational and user), that normally impact on technology trust, to ten factors, namely,

- technological category:
 - technology adoption
 - technology utility
 - technology usability
- organisational category:
 - organisational trust
 - pooled interdependence
 - organisational community
 - organisational culture
- user category:
 - socialization
 - sensitivity to privacy
 - predisposition to trust

All these factors, except sensitivity to privacy, are proposed to have a positive relationship to technology trust, which will then be positively transferred to implementation success (See Figure 3 for the full model).

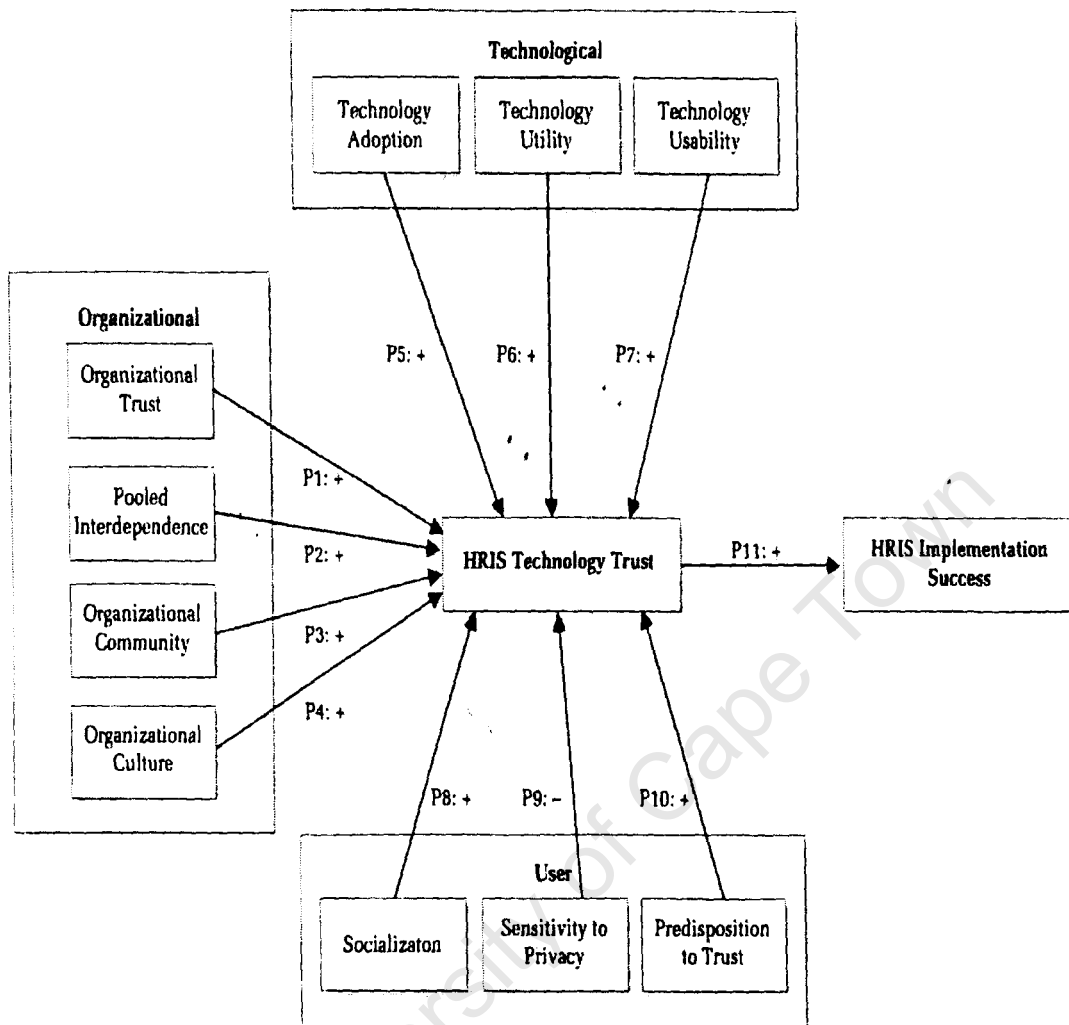


Figure 3. The Lippert and Swiercz model of technology trust in human resource information systems (2005).

The statement of Lippert and Swiercz (2005), "that understanding the role of technology trust in the HRIS implementation success formula offers significant promise for explaining a major component of the implementation process" (p. 342), might be proven true as researchers determine the validity of their propositions and the completeness and robustness of their model.

The elements of the Lippert and Swiercz model in more detail

Trust

Trust forms the foundation construct of technology trust and needs some clarification in the interpretation of the model.

Trust is generally known as a particular form of belief in the truth of a proposition that authorises action and enables the development of social connections. Trust is therefore a belief, but not necessarily a knowledge-based one. Trust is 'a reliance, Hosmer (1995) reviewed the different behavioural definitions of trust and then redefined trust as "the reliance by one person, group, or firm upon a voluntarily accepted duty on the part of another person, group, or firm to recognise and protect the rights and interests of all others engaged in a joint endeavour or economic exchange" (p. 393).

Orientated towards a specific object, trust is more than a simple calculated estimation of data (Lippert, 2002). This object of trust does not necessarily have to be a person, but can also be an object, as illustrated by humans trusting an object like an automatic teller machine (ATM), a personal computer (PC), the software on PCs, cellular telephones or the networks supporting these applications. Rousseau, Sitkin, Burt and Camerer (1998) referred in their research on the cross-discipline view of trust to new and emerging forms of trust. Ratnasingam (2005) referred to trust as an important factor in e-commerce success, she quoted Keen who said "We are moving from an IT economy to a trust economy" (p.1).

There is general agreement among researchers of all disciplines about the importance of trust in human behaviour. It seems as if there is tentative agreement among researchers that trust is a

multidisciplinary concept that can be applied as such. Bews and Rossouw (2002) felt that an interdisciplinary approach is needed to understand trust as the nature of trust transcends any single discipline. They further argued that the decline of trust in organisations needs to be addressed urgently because of the following reasons;

- The cost of distrust
- The effect on participation and teamwork
- Loyalty
- The impact on alliances

Hupcey, Penrod, Morse, and Mitcham (2000) found the interdisciplinary concept of trust to be immature. They compared the conceptual components of trust namely, the antecedents of trust, the attributes of trust, the boundaries of trust and the outcomes of trust across disciplines. Several researchers explored the multidisciplinary nature of trust to identify the shared understandings of trust across disciplines. Rousseau, Sitkin, Burt and Camerer (1998) found that across disciplines the following conditions must exist for trust to arise: i) risk – as the decisionmaker's perceived probability of loss, ii) interdependence – where the interest of one party cannot be achieved without relying on another and iii) the potential for the trust relationship between parties to change.

A cross-disciplinary application needs to adhere to these minimum conditions to give rise to trust. Technology trust as construct adheres to these conditions and can therefore be used as a predictor of implementation success. Rousseau et al. concluded by stating, "we observe considerable overlap and synthesis in contemporary scholarship on trust" (p. 401).

Technology trust

While a person is the object in interpersonal trust, technology is the object of trust in technology trust. Technology trust can be defined as an individual's willingness to be vulnerable to technology, based on person-specific expectations of the technology's predictability, reliability, and utility as moderated by the individual's disposition to trust the technology (Lippert, 2001).

Users exercise control in their interaction with technology, thus technology is created and changed by human action, yet it is also used by humans to accomplish some action. The increasing incorporation of technology in all aspects of work has led to the interplay between organization, people and IS; this interplay is described as the duality of technology by Orlikowski (1992). The constant interplay between people and technology has led to new dimensions and depth of technology trust.

Lippert (2000) stated that trusting technology is different from trusting a human being and identified the following two differences: i) trusting a technology is a one-directional activity, as the technology cannot return the trust of the human and ii) the trustworthiness of a technology cannot be assessed, measured or evaluated by the same measures used to evaluate a human's trustworthiness. She identified the following two similarities: i) trust evaluations are made after each interaction and ii) an individual's predisposition to trust influences both trust relationships (human and technology). Based on the above characteristics of technology trust Lippert (2001) developed a definition and model of Trust in Information Systems Technology (TIST) to describe the new construct of technology trust. According to her: "Technology trust is conceptualised as being both multi-dimensional and influenced by a

range of factors, including a predisposition to trust technology. Technology can be evaluated by assessing the technology's predictability, reliability, and utility and through consideration of the individual's predilection to trust technology" (Lippert, 2005, p. 343).

Proposition 1: Higher of HRIS technology trust will lead to higher levels of HRIS implementation success.

User Category

The user category consists of the factors, socialisation, sensitivity to privacy and predisposition to trust. The factors will be discussed in more detail and will close with the Lippert and Swiercz's proposition as included in their model.

Socialisation

Organisational socialisation is the process through which newcomers to an organisation are transformed into effective employees, from outsider to integrated and effective insider (Cooper-Thomas & Anderson, 2006). Integrated and effective employees are those who understand and have adopted the ethos, values, and norms of the company (King, Xia, Quick & Sethi, 2005), they have also developed a spirit of co-operation and company loyalty (Garavan & Morley, 1997). Current members play an important role in ensuring that newcomers have the knowledge, attitudes and behaviour required to participate in organisational activities. Organisational socialisation also enables current members of the organisation to share knowledge and learn new roles over time.

Socialization takes place over time, but various socialisation strategies and tactics can be employed, with varied success to

hasten this transition process (King et al, 2005; McMillan-Capehart, 2005).

Proposition 2: New employees explicitly socialised to the role and significance of HRIS technology will experience higher levels of HRIS technology trust.

Sensitivity to Privacy

Technological development has brought new threats to individuals' privacy. Online transactions, new information technologies that have improved the collection, storage, use, access and sharing of personal information are all threats to the individual's sense of privacy (Hewett & Whitaker, 2002). Shalhoub (2006) described an individual's privacy as the right to be left alone and in control of the flow and disclosure of his/her information

Clark (as cited in Skinner, Han & Chang, 2006, p. 383) defined information privacy as "the interest an individual has in controlling, or at least significantly influencing, the handling of data about themselves." Skinner et al. also referred to Clarke's definition of privacy dimensions: privacy of the person, of personal behaviour, communications and personal data. Of interest to the construct technology trust is the privacy of personal communications and the privacy of personal data, information privacy. Legislation, company policies and institutional mechanisms are all put into place to protect the individual's privacy and enhance trust in electronic activities.

Taking these electronic intrusions or threats to an individual's privacy into account it is clear why this factor is the only one in the Lippert and Swiercz model that they proposed to have a negative

relation to technology trust. People with higher levels of sensitivity to privacy will thus have lower levels of technology trust.

Proposition 3: Higher levels of personal sensitivity to privacy will lead to lower levels of HRIS technology trust.

Predisposition to trust

Predisposition to trust is the propensity to trust or distrust in general (Costigan, Insinga, Krañas, Kureshov & Ilter, 2004). Lippert (2005) described it as an individual's expectation toward trusting in general. The predisposition to trust is activated when there is limited information available about the object of trust, specifically with initial encounters.

Predisposition to trust is not more influential in trust judgments in new relationships and differs between countries (Costigan, et al., 2004). Trust is best predicted by a combination of general disposition (predisposition) to trust and situational factors (Payne and Clark, 2003).

Predisposition to trust is developed over time, through experience and application to the environment that leads to a greater probability of correctly predicting the outcome. This outcome equals the level of trust in an individual or object. Individuals differ in their general expectancy of trust from others. The predisposition is varied, but fairly stable over time (Rotter, 1967).

Proposition 4: Individuals that exhibit a greater overall predisposition to trust will express higher levels of HRIS technology trust.

Technological Category

Technology adoption, technology usability and technology utility are the factors that form the technological category.

Technology Adoption

Technology adoption is determined by the cumulative result of past and current assessments of technology interactions. Positive assessments act as positive reinforcements and will quicken and strengthen technology adoption. Negative assessments due to negative interactions will lead to the slower adoption or rejection of the particular technology, reversing of the earlier adoption decision (Lippert and Swiercz, 2005). Negative assessments can also influence the adoption of other non-related technologies with immature technology users.

The technology adoption process is related to the innovation-decision process as described by Rogers (as cited in Seligman, 2006) as the process through which an individual passes i) from first knowledge of an innovation, ii) to forming an attitude toward the innovation, iii) to a decision to adopt or reject, iv) to implementation of the new idea, and v) to confirmation of this decision.

Research by Au and Enderwick (2000) confirmed that an individual's attitude towards adoption is affected by six internal beliefs:

- perceived difficulty – that is the degree to which the perceived application of the “foreign” technology is free of effort.
- adoptive experiences – it is the accumulated technical knowledge gained through previous experiences.
- suppliers' commitment to the firm – can decrease the risk of adopting a foreign technology

- perceived benefits – the likelihood for improved economic benefits for the individual or organisation.
- Compatibility – the compatibility between existing and new technologies.
- enhanced value – benefits indirectly related to the adoption of the technology.

Conscious recognition, personally experiencing the benefits of new technology and observing the technology performing well across multiple applications lead to reinforcement of the individual's adoption decision (Lippert & Swiercz, 2005).

Proposition 5: Higher favorable technology adoption experiences will be positively related to higher trust in HRIS technology.

Technology Usability

Technology is interwoven in the structure, process and activities of the modern organisation. Technology affects institutional properties of the organisation and the users of technology, while the users also influence the technology. Researchers examining the utilization of technology must focus on both directions of the relationship (Orlikowski, 1992).

Usability is a multifaceted issue, highly contextual and varied according to users' occupational role (McLaughlin & Skinner, 2000). The sponsors, designers and implementers of new technology must involve users to ensure usability after implementation. Usability is much more than making systems user friendly and providing training. McLaughlin and Skinner found the following six related but distinctive components of usability;

- checkability – there are controls/checks to ensure that the correct information is interfaced,
- confidence – users have confidence in their own capability and the system itself,
- control – users have control of the operation of the system, in particular of the interfaces with the system,
- ease of use – the system is easy to use,
- speed – the system processes fast and
- understanding – users understand the system and its outputs.

The factors perceived usefulness and perceived ease of use in user acceptance of information technology could be measured with scales developed by Davis (1998).

Proposition 6: Higher user perceptions of technology usability are positively related to HRIS technology trust.

Technology Utility

Utility is the usefulness of the system. Users evolve to finding a system useful through their engagement with the system and its problems in making it usable, their incorporation of the system into their working lives (McLaughlin & Skinner, 2000). See Table 2 for a representation of this transition from the pursuit of usability to the development of utility.

Table 2

Comparing Usability and Utility.

	Usability value	Utility value
Checkability	Users feel the system has enough safeguards to make it safe to use.	The system is used to check information and to check on the organisation.
Confidence	Users have confidence in the system and their use of it.	Users have confidence in the system to change things in their organisation
Control	Users feel that they have control over the system.	Users use the system to control their immediate environment.
Ease of use	The system is easy to use.	The system makes work easier.
Speed	The system is quick to use.	The system makes work or reaching decisions quicker.
Understanding	The system is understandable.	The system is used to make things understandable.

Proposition 7: Higher user perceptions of technology utility are positively related to HRIS technology trust.

Organisational Category

The organisational category consists of the factors, organisational trust, pooled interdependence, organisational community and

organisational culture. Each of these factors will be discussed in more detail.

Organisational trust

Organisational trust is the trust orientation of the organisational members toward the employing firm (Zaheer, McEvily & Perrone, 1998). Trust in organisations is important in the changing world of work, because it enables co-operation. Command and control approaches are getting more difficult due to the changing nature of work itself. In their study of procedural justice and motive based trust Tyler (2003) found that "motive based trust is central in situations where traditional mechanisms for motivating co-operation are problematic" (p.59). Changes in the nature of work and the nature of co-operation have resulted in the old methods/styles of securing co-operation becoming obsolete. There is greater emphasis on voluntary forms of co-operation that is far more difficult to achieve making the study of trust that is the key to co-operation, very important. Tyler also found that traditional social control mechanisms are being lost and that there is a greater willingness to terminate social and work relationships.

The International Association of Business Communicator (IABC) Research Foundation (2000, p.6) defines organisational trust as "the organisation's willingness, based on its culture and communication behaviours in relationships and transactions, to be appropriately vulnerable if it believes that another individual, group, or organisation is competent, operand honest, concerned, reliable, and identified common goals, norms and values."

From the moment an individual makes the decision to join an organisation (i.e. an initial trust judgment) he or she continuously

makes further trust judgments, revisiting and reevaluating his/her initial trust judgments. Shockley-Zabalak (2000) found in her cross-industry survey of organisations in the United States and Europe that organisational trust is driven by:

- Concern: feelings of empathy, tolerance and safety.
- Openness and honesty: the most commonly mentioned characteristic of trust.
- Identification: the extent to which members of an organisation hold common goals, norms and values.
- Reliability: doing what we say.
- Competence: an organisation's ability to compete effectively.

Keeping commitments and promises can create trust. Sharing yourself honestly through open communication and listening also create trust. Keeping confidence, being accessible, telling the truth and showing respect is further creators of trust. Co-operating and looking for ways to help, showing respect, being fair and consistent, being accountable, avoiding excuses and blaming were also identified as creating trust (Brownell, 2000).

Trust can also be breached and Robinson (1996) investigated how an employee's trust in his/her employer will influence the employee's recognition of a breach of trust and his/her interpretation and reaction to the perceived breach of trust.

The important role that organisational trust plays in promoting co-operation in organisations leads to Lippert and Swiercz's proposition on organisational and technology trust.

Proposition 8: Higher levels of organisational trust lead to higher levels of HRIS technology trust.

Pooled interdependence

In their description of pooled interdependence Lippert and Swiercz (2005) relied strongly on the work of Thompson (1967) where he stated that interdependence referred to the interconnection of work processes. It is the dynamic in which each part of the organisation is supported by organisation, but also contributes to the whole. He classified interdependence in three categories:

- pooled - where all objects of trust contribute to the overall goal – with no coordination.
- sequential - where interactions are performed in sequence – with simple coordination.
- reciprocal - elements must be considered simultaneously as they are directly affected by each other – with complex coordination.

Van de Ven (as cited in Comeau & Griffith, 2005) added team interdependence, as a fourth sub-category. Coeau et al. found that organisational citizenship behaviour (OCB) became more prevalent as group workloads became more interdependent.

Lippert and Swiercz (2005) stated that although Thompson's work was done before the proliferation of computer technology his work is relevant to the current day interdependence of information technology and included the factor in their model of technology trust.

Proposition 9: Higher levels of pooled interdependence lead to higher levels of HRIS technology trust.

Organisational community

The concept of organisational community is not new. All organisations at least try to align their employees around shared visions, missions and processes. Most of us have experienced the binding effect of mission statements, common interests, shared goals and principles, all efforts to create organisational community. The employee's behaviour and contribution earns membership of this organisational community that offers privileges to "their members" as long as they commit to the standards and rules of the organisational community. Trusting the HRIS is related to the maintenance of the organisational community, as the costs for not trusting the HRIS are cumulative on an organisational level. New and continuing employees have to become fully engaged in HRIS implementations to experience an on-going sense of community membership (Lippert & Swiercz, 2005).

Lawrence (1993) found in his study of the Canadian forensic accounting community that standards and membership rules define an organisational community by ensuring sustained patterns of activity. Hislop (2003) found that communities of practice exerted a significant influence on the innovation processes he examined.

Proposition 10: Higher levels of organisational community lead to increased levels of HRIS technology trust.

Organisational culture

Schein (1996) described organisational culture as reflecting an organisation's fundamental beliefs about how it should function, its accepted norms of behaviour and the path to achieving its goals. Researchers underrate the importance of organisational culture

when studying social systems in organisations (Cabrera, Cabrera & Barajas, 2001; Schein, 1996). Park, Ribiere and Schulte (2004) saw organisational culture "as the character or personality of an organisation" (p 107).

An organisation's founders determine its initial culture; with one of the key elements of organisation culture being the way an organisation manages its employees (Cabrera, Cabrera & Barajas, 2001). Different groups within an organisation might have/develop their own sub-cultures. Organisational culture can to some extent be changed, with technology being one of the influences which can change organisational culture.

Studies show that organisational culture impacts user satisfaction, technology adoption and assimilation (Cabrera et al, 2001; Fink, 1998). In their study of critical attributes of organisational culture that promote knowledge management (KM) technology implementation success Park, Ribiere and Schulte (2004) found that the following cultural attributes, sharing information freely, working closely with others, team-orientated work, trust, fairness and enthusiasm have a moderate to high positive correlation with implementation success. The cultural attributes, being calm, attention to detail, risk taking and compliance were among those that showed a negative correlation to implementation success.

Organisational trust is one of the elements of organisational culture (Lippert & Swiercz, 2005). Individual trust violations or confirmations towards employees are reflected in organisational trust and ultimately organisational culture. Cabrera et al. (2001) found culture a useful way of understanding the collective determinants of behaviour and conclude that "organisational culture is a key construct in understanding and managing the behaviour of

people within the boundaries of an organisation and implementing organisational change” (p. 260).

Schein (1996) summarised the impact of organisational culture in organisations as follows: “one is dealing with a social force that is invisible yet very powerful” (p. 240), which leads to proposition 11: Organisations with a high trust culture will experience higher degrees of trust in their HRIS technology.

The Stone, Johnson, Stone-Romero and Markova Model (2006).

Stone, Johnson, Stone-Romero and Markova (2006) found that there was growing use of eHR systems in the industry. Little research has been done to determine the effectiveness and acceptance of eHR systems, despite their widespread use. Based on the principle that the effectiveness of eHR systems depend on employee use and acceptance of the systems, they proposed a model for the acceptance of eHR systems (Figure 4).

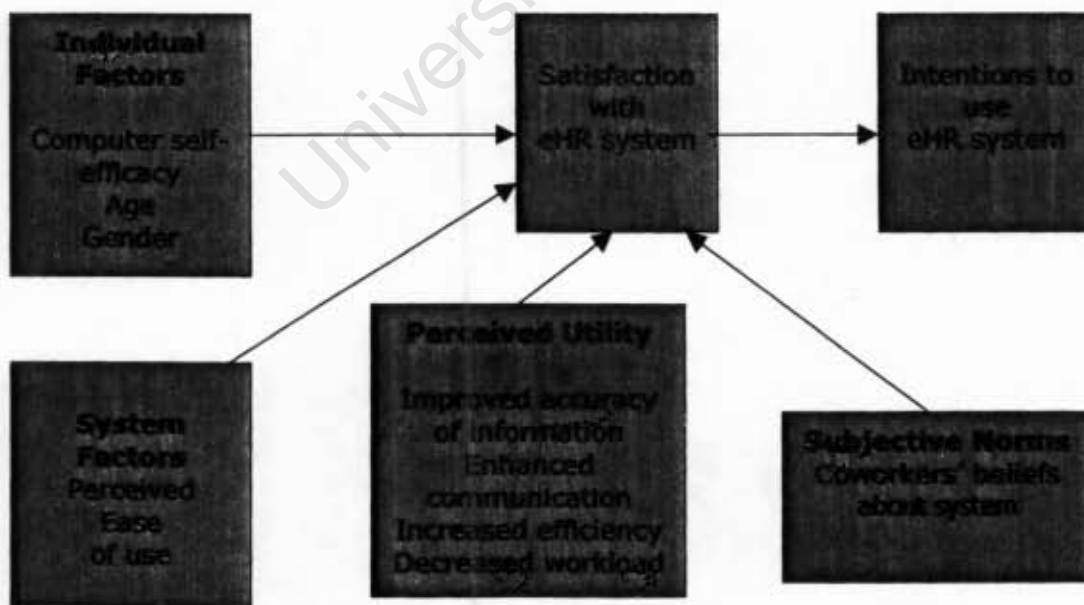


Figure.4. Stone, Johnson, Stone-Romero and Markova (2006) model of the factors related to the acceptance of eHR Systems

Their model proposed that an individual's computer self-efficacy levels would be positively related to his/her intentions to use and satisfaction with the eHR system.

In their model they define four major factors that determine satisfaction with eHR and the intention to use an eHR system namely: individual factors, system factors, perceived utility and subjective norms. The individual factor consisted of, computer self-efficacy, age and gender. Perceived ease of use was used as a measure of the system factor, The factor perceived utility was based on improved accuracy of information, enhanced communication, increased efficiency and decreased workload. Co-workers' beliefs about the system determined the subjective norms factor.

The relation between satisfaction with and intention to use eHR system and the factors, enhanced communication, decreased workload and enhanced efficiency were researched for the first time (Stone, Johnson, Stone-Romero & Markova, 2006). The research was done at a large Southeastern university, in the United States of America, that implemented HRIS 18 months earlier. Table 3 contains a summary of the measures used in their research.

Table 3

Summary of measures used in Stone, Johnson, Stone-Romero and Markova's research.

Factor	Example of a Question	Number of items	Alpha
Computer self-efficacy	"I have the ability to use the HRIS system"	3	0.68
Perceived ease of use	"I believe the HRIS is very easy to use"	7	0.72
Information accuracy	"The HRIS provides me with very accurate information"	5	0.72
Increased efficiency	"The HRIS has helped me do my work more efficiently"	4	0.83
Decreased workload	"The HRIS has helped decrease my workload"	5	0.96
Subjective norms	"My co-workers dislike the HRIS system"	8	0.91
Satisfaction with the eHR system	"Overall, I'm extremely satisfied with the HRIS system"	8	0.97
Intentions to use system	"I do not intend to use the HRIS in the future"	4	0.84

They concluded that there must be an understanding that co-workers' beliefs may be related to satisfaction and the use of systems. It was also found that more research is needed to determine whether there are other factors that may be related to eHR system acceptance. The relation between system acceptance and effectiveness also needs to be more researched in more detail.

The results of their research is summarised in Table 4.

Table 4

Relationship of factors to system satisfaction and intentions to use.

Factor	System Satisfaction	Intentions to use
Individual Factor		
Self-efficacy	No relation	No relation
System Factor		
Perceived ease of use	Positive relation	No relation
Perceived utility		
Increased information accuracy	Positive relation	No relation
Enhanced communication	Positive relation	Positive relation
Increased efficiency	Positive relation	No relation
Decreased workload	No relation	Positive relation
Subjective norms	Positive relation	No relation

A Comparison of the models measuring implementation success.

A comparison of these models (See Table 5) show a central theme which can be defined as i) inputs, leading to an ii) interim result which ends in iii) implementation success.

Table 5

A Comparison of Models measuring implementation success.

Model	DeLone & McLean (*updated 2003)	Stone, Johnson, Stone-Romero & Karkova (2006)	Lippert & Swiercz (2005)
Inputs	Information Quality - measures semantic success	Individual Factors: Age, Gender, Computer self-efficacy	User Factors: Socialisation, sensitivity to privacy, predisposition to trust
	System Quality - measures technical success	System Factors: Perceived ease of use	Technological Factors: Technology adoption, technology utility, technology usability
	*Service Quality	Perceived Utility: Improved accuracy of information, Increased efficiency, decreased workload	Organisational Factors: Organisational trust, pooled interdependence, organisational community, organisational culture
		Subjective norms: Co-workers' belief about system	
Inter-mediate result	*Intention to use / Use	Satisfaction with eHR system	Technology trust
Implementation success	*Net Benefits - all impact measures	Intentions to use eHR system	Implementation success

The elements/factors in the models showed some commonality, a few shared elements, but in general it reflected the uncertainty of

researchers and the IT community in general on the driving factors (non-technical) behind IT implementation success. The uncertainty as far as the contribution of these factors to implementation success is even bigger.

Amidst this uncertainty it was decided to investigate the applicability of the Lippert and Swiercz model to a student administration system at a university. The direction and strength of some of the factors in the Lippert and Swiercz model will also be tested. The Lippert and Swiercz model was chosen as it presents as a balanced model, which attempts to address the complexities of the social and operational, demands of modern IT implementations. The factors contained in the model are well researched. There are valid existing measurement instruments for some of the factors.

The DeLone and McLean Information System Success Model is a well known and proven model, while the Stone, Johnson, Stone-Romero and Markova model was introduced after this research was started.

Research Questions

The Lippert and Swiercz model has been carefully constructed by the authors, but has not been tested empirically in the context of a software implementation. In this paper, I will test this model in the context of a PeopleSoft Student Administration system implementation at the University of Cape Town. My first research question is: Do the scales developed by Lippert and Swiercz for their model show stability when applied to a different context, i.e. a software implementation at a South African university?

Lippert and Swiercz postulated various relationships between their model's independent variable, technology trust, and the dependent variables. Research question two will examine whether the same relationships exist between dependent and independent variable of the model in a South African context. In order to provide a full answer to this research question, I will also examine whether there is a positive, unidirectional relationship between technology trust and HRIS implementation success.

For my third research question, I will examine whether all independent variables contribute equally to the dependent variable of technology trust. This research question is important, as it will provide a guideline for which independent variables are of value to the model.

METHOD

1.) Research design

This is a descriptive study where a questionnaire was used to test the applicability of Lippert and Swiercz's (2005) model of technology trust.

2.) Context

The implementation environment at UCT was a very challenging in the summer of 2006, the time of the PeopleSoft implementation. The system was implemented during the 2006 student registration, a peak period in the operation of a university. The implementation was also hampered by long periods without electricity as the Western Cape (where the university is situated) was subject to first, infrequent and later rolling blackouts by Eskom due to problems at the Koeberg power station, main supplier of electricity to the Western Cape.

On the system side there were more resistance by the users as the PeopleSoft system replaced a system that was in use for many years and irrespective of its shortcomings were stable and reliable. The university were using different systems for financial, human resource and student administration applications, making integration difficult

3) Participants

A total of 343 staff members were identified from the training records of the PeopleSoft implementation project at a local university. All 343 staff members had received training in the use of PeopleSoft. A total of 90 staff members returned their

completed surveys. This represents 26% of the sample. The response rate of 26% is low despite numerous efforts to increase the response. The efforts included an incentive in the form of a lucky draw, emails explaining the importance of the study and follow-up emails to the non-respondents.

Of these 90 participants, 14% were male and 85% female. Most of the participants (62%) had worked at the university for more than three years; 24% had worked there for more than 1, but less than 3 years, while 14% were relative newcomers with less than one year's tenure.

4) Measuring instrument

In this study we used a questionnaire consisting of eleven sections (the complete questionnaire is attached as Appendix A). Each one of these sections, with its specific questions and alpha coefficient will be discussed as follows: dependent variable, independent variables and demographic variables.

4.1) Dependent variable:

4.1.1) Technology trust

Technology trust in the PeopleSoft application was measured with four questions developed by Lippert and Swiercz (2005); these questions are shown in Table 6. In the Lippert and Swiercz study the questions had an alpha coefficient of 0.95.

Table 6

Survey questions used for technology trust.

Survey Question number	Question
7	I think the PeopleSoft Student Administration System is predictable.
8	I can rely on the PeopleSoft Student Administration System to be working when I need it.
9	I have faith that the PeopleSoft Student Administration System will function as I expect it.
10	I have a high degree of confidence that the PeopleSoft Student Administration System will be working when I need it.

4.2) Independent variables:

4.2.1) User variables

4.2.1.1) Socialization

This variable was not used in the study because there was no measurement instrument available for measuring this variable.

4.2.1.2) Sensitivity to Privacy

This variable was also not used in the study because there was no measurement instrument available for measuring this variable.

4.2.1.3) Predisposition to trust

Predisposition to trust, as construct, was measured with five questions based on the work done by Rotter (1967) on individuals' predisposition to trust. The five questions in Table 7 were used. No previous alpha coefficient was available.

Table 7

Survey questions used for predisposition to trust.

Survey Question number	Question
11	I believe that most people are generally well intentioned.
12	I think that most people I deal with are honest and trustworthy.
13	My first reaction is to trust people.
14	I tend to assume the best about people.
15	I have a great deal of faith in human nature.

4.2.1.4) Adequacy of training received

The factor "the adequacy of training" is a traditional user factor in the constructs of technology trust and implementation success. The researcher believes that the inclusion of this factor will add to the completeness of the construct technology trust.

User training has a significant influence on the acceptance of the IS (Marais & Kruger, 2005). They came to this conclusion in their study to understand the human issues in the implementation of an IS, through the analysis of user perceptions and opinions.

In a study by Bailey and Pearson (1983) the factor “degree of training” was rated a low twenty-fourth out of thirty-nine factors of user satisfaction this is in contrast with Cleland and others (2001) who found that the training of employees is one of the critical human issues in technology implementation.

Adequacy of training received was measured by using six questions developed by the researcher. The questions in Table 8 were used in the questionnaire.

Table 8

Survey questions used for adequacy of training received.

Survey Question number	Question
37	I received adequate training on the PeopleSoft Administration system.
38	The training I received was relevant to my tasks and responsibilities.
39	I need more training to enable me to do my job properly.
40	The 'help documentation' on the system covers all the relevant topics.
41	The 'help documentation' on the system is user friendly and easy to use.
42	The 'trouble shooting' guides from ICTS helpdesk staff are a real help.

4.2.2) Technology variables

4.2.2.1) Technology adoption

Technology adoption, as construct, was also not used in the study due to the unavailability of a suitable measurement instrument.

4.2.2.2) Technology usability

Technology usability was measured with six questions used in by work done by McLaughlin and Skinner (2000) on developing usability and utility. These questions are shown in Table 9. No previous alpha coefficient was available.

Table 9

Survey questions used for technology usability.

Survey Question number	Question
1	The PeopleSoft Student Administration System is easy to use.
2	The PeopleSoft Student Administration System is quick to use.
3	The PeopleSoft Student Administration System is easy to understand.
4	I feel that I have control over information in the system.
5	The system enables me to input and retrieve accurate data.
6	I have confidence in the system.

4.2.2.3) Technology utility

This variable was also not used in the study because there was no suitable measurement instrument available for measuring this variable.

4.2.3) Organisational variables

4.2.3.1) Organisational trust

Seven questions as used by Robinson (1996) with an alpha coefficient of 0.82/0.87 were included to test organisational trust. See Table 10 for these questions.

Table 10

Survey questions used for organisational trust.

Survey Question number	Question
20	I believe my employer has high integrity.
21	I can expect my employer to treat me in a consistent and predictable fashion.
22	My employer is always honest and truthful.
23	In general, I believe my employer's motives and intentions are good.
24	I think my employer treats me fairly.
25	My employer is open and upfront with me.
26	I fully trust my employer.

4.2.3.2) Pooled interdependence

The organisational variable pooled interdependence was not included in the study due to the unavailability of a suitable measurement instruments.

4.2.3.3) Organisational community

Organisational community was not used in the study because there was no suitable measurement instrument available.

4.2.3.4) Organisational culture

Organisational culture was measured by using four questions from the UCT Climate Survey (2003). The four questions in Table 11 were used to determine organisational culture.

Table 11

Survey questions used for organisational culture.

Survey Question number	Question
16	The university's leaders take responsibility for their decisions.
17	I am satisfied with the way in which decisions about information systems are made in the University.
18	Information about important information systems issues is shared openly with staff.
19	The University's leaders give consistent messages about UCT's information systems priorities.

4.3) The construct implementation success

The using four subscales measured the construct implementation success. Satisfaction with the application, realised benefits of the application, technology performance and technology utilisation were used to measure implementation success.

4.3.1) Satisfaction with the application

Satisfaction with the PeopleSoft Administration system was determined by a using four questions used by Ganesan (1994) for rating satisfaction on a 7 point scale anchored on each end by the following words in Table 12.

Table 12

Survey questions used for realised benefits.

Survey Question number	Question
6.1	Displeased/Pleased
6.2	Sad/Happy
6.3	Disgusted/Contented
6.4	Dissatisfied/Satisfied

4.3.2) Realised benefits of the application

Realised benefits of the application were measured by using five questions developed by the researcher. No previous alpha coefficient available.

The questions in Table 13 were used in the questionnaire to determine realised benefits.

Table 13

Survey questions used for realised benefits.

Survey Question number	Question
27	It saves me time.
28	It is accurate.
29	It produces good reports.
30	It increases my productivity.
31	It assists me in good decision-making.

4.3.3) Technology performance

Technology performance of the application was measured by using 5 questions originally developed by Lippert (2005). These questions were slightly adapted to suit the UCT context. The original alpha coefficient was 0.90.

The questions in Table 14 were used in the questionnaire to determine technology performance.

Table 14

Survey questions used for technology performance.

Survey Question number	Question
32	It produces accurate information.
33	It is always available to use.
34	It processes transactions fast.
35	It integrates well with other relevant applications.
36	It is a reliable system.

4.3.4) Technology utilization

Technology utilization of the application was measured by six questions developed by the researcher. Staff members were asked to indicate their utilization of different application areas. The application areas in Table 15 were used in the questionnaire.

Table 15

Application areas used in the survey.

Survey Question number	Question
43	Student admissions.
44	Student registrations.
45	Uploading of registration marks.
46	Capturing of course information.
47	Student fees.
48	Look up, student records and class lists.
49	An open type of "other" was also included.

The utilization of an application area was measured with a 7-point Likert scale to determine the respondents' utilisation of the different application areas. The following ratings were used:

- 0 - Not used in my job
- 1 - Never
- 2 - Far below average use
- 3 - Slightly below average
- 4 - Average use
- 5 - Slightly above average
- 6 - Far above average use
- 7 - All the time

5) Procedure

A copy of the survey was distributed by electronic mail to all staff that received PeopleSoft training. The mail system of the University

of Cape Town was used and the Webmaster of UCT distributed the mail per mass mail. The email addresses of the participants were supplied to the Webmaster per electronic file by the researcher. The survey was attached to an email, addressed to the participants, explaining the goal of the research and instructions for completing the survey.

Electronic controls ensured accurate and complete data from participants.

Additional reminders were sent to the participants who had not returned their surveys after two weeks. The data collection process lasted eight weeks. A lucky draw formed part of the survey to encourage identified staff members to take part in the study. The researcher's contact details were supplied to handle questions.

The Webmaster stripped the surveys of all personal details ensuring the confidentiality of results. The Webmaster placed the results on a data file for use by the researcher.

RESULTS AND DISCUSSION

1.) Stability of scales

In order to test the stability of the scales used and answer the first research question namely, "do the scales developed by Lippert and Swiercz for their model show stability when applied to a different context", alpha coefficients were calculated for each sub-scale, the results are included in Table 16.

Table 16

Summary of descriptive statistics for variables used in the research.

Variable	Mean	Standard Deviation	Skewness	Kurtosis	Average inter-item correlation	Cronbach alpha
Predisposition to Trust (5)*	5.48	0.98	-1.65	3.42	0.37	0.74
Organisational Trust (7)	4.62	1.54	-0.79	-0.23	0.74	0.95
Satisfaction (4)	4.34	1.98	-0.16	-1.07	0.87	0.96
Organisational Culture (4)	4.05	1.54	-0.28	-0.85	0.65	0.88
Technology Trust (4)	3.97	1.60	-0.42	-0.97	0.63	0.87
Technology Performance (5)	3.92	1.49	0.02	-0.42	0.68	0.91
Technology Usability (6)	3.81	1.65	-0.13	-1.17	0.64	0.91
Realised Benefits (5)	3.72	1.59	0.11	-0.89	0.64	0.90
Adequacy of training (6)	3.38	0.85	-0.71	0.25	0.37	0.72
Technology Utilisation (6)						Not usable

* Number of questions/items.

1.1) Dependent variable

1.1.1) Technology trust

The Cronbach alpha for the four questions, determining the technology trust, is 0.87. The average inter-item correlation is 0.63. In this study the questions for technology trust showed consistent results with the original study (alpha = 0.95) and the questions for the construct organisational trust is confirmed as a valid measure.

The mean for the scores of the construct is 3.97 with a standard deviation of 1.60. The distribution of scores is flat (kurtosis = -0.97) while negatively skewed (skewness = -0.28).

1.2) Independent variables

1.2.1) User variables

1.2.1.1) Predisposition to trust

The Cronbach alpha for the five questions, determining the construct predisposition to trust, is 0.74. The average inter-item correlation is 0.37. The questions for the construct, predisposition to trust, are accepted as a valid measure.

The mean for the scores of the construct is a very high, 5.48 with a standard deviation of 0.98. The distribution of scores has a very high peak (kurtosis = 3.42) with a very strong negative skewness (-1.65), which is consistent with the high mean score. (See Figure 5)

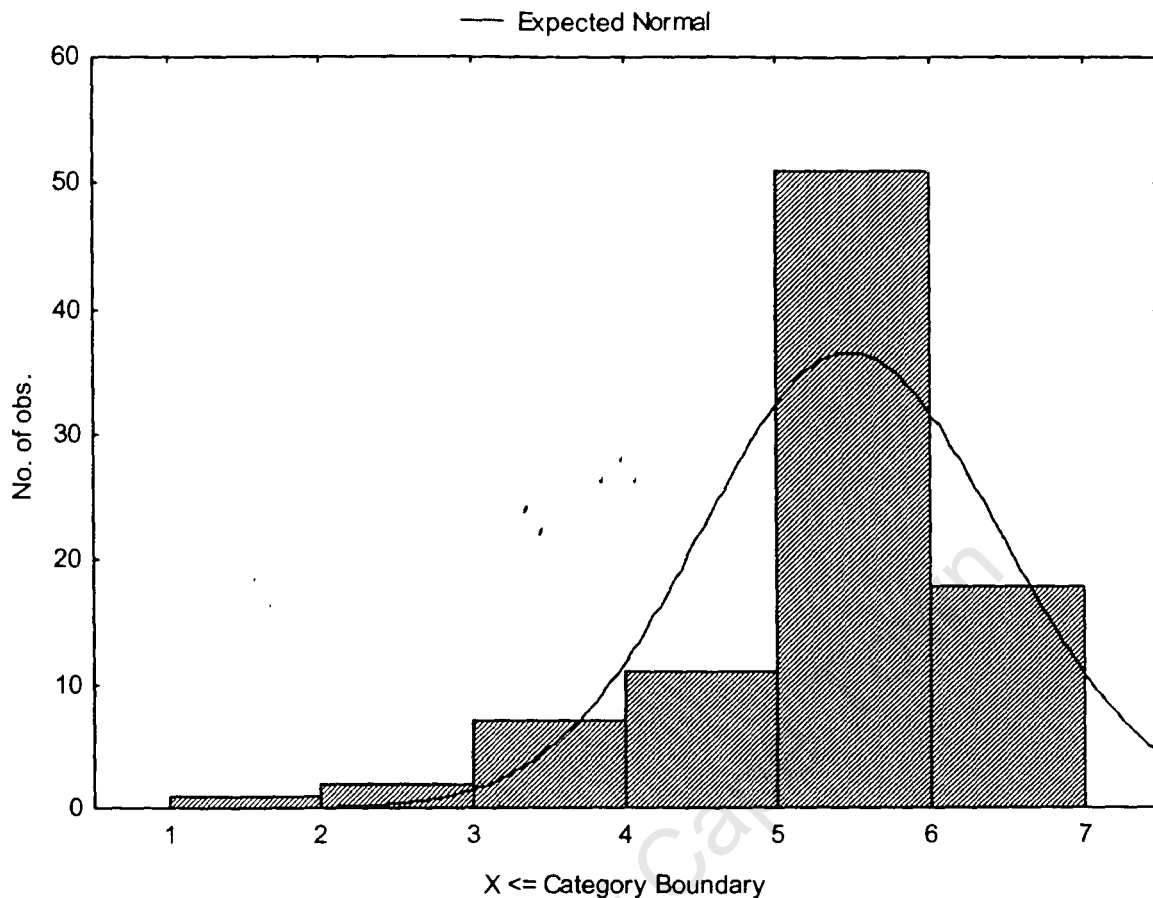


Figure 5. Histogram of scores for the construct predisposition to Trust.

1.2.1.2) Adequacy of training received

The Cronbach alpha for the six questions, determining the adequacy of training, is 0.72. The average inter-item correlation is a low 0.37. In future use of the questions, measuring this construct, the researcher might consider leaving out questions 39 and 42 to improve the alpha (See Table 17).

Table 17

Correlations for the questions used to determine adequacy of training.

Question	37	38	39	40	41	42
37	1.00	0.76	-0.29	0.48	0.43	0.39
38	0.76	1.00	-0.11	0.49	0.44	0.40
39	-0.29	-0.11	1.00	-0.12	-0.05	0.05
40	0.48	0.49	-0.12	1.00	0.88	0.55
41	0.43	0.44	-0.05	0.88	1.00	0.49
42	0.39	0.40	0.05	0.55	0.49	1.00

The mean for the scores of the construct is 3.38 with a standard deviation of 0.85. The distribution of scores is negatively skewed (skewness -0.71), with a kurtosis of 0.25.

1.2.2) Technology variables

1.2.2.1) Technology usability

The Cronbach alpha for the six questions, determining the construct usability, is 0.91. The average inter-item correlation is 0.64. The questions for construct usability are accepted as a valid measure.

The mean for the scores of the construct is 3.81 with a standard deviation of 1.65. The distribution of scores is flat (kurtosis = -1.17) with a slight negative skewness (-0.13).

1.2.3) Organisational variables

1.2.3.1) Organisational trust

The Cronbach alpha for the seven questions, determining the construct organisational trust, is 0.95. The average inter-item correlation is 0.74. In this study the questions for the construct organisational trust showed consistent results with the original study (alpha = 0.82-0.87) and the questions for the construct organisational trust is confirmed as a valid measure.

The mean for the scores of the construct is a high 4.62 with a standard deviation of 1.54. The distribution of scores is negatively skewed (skewness = -0.79), with no meaningful deviation in terms of its flatness (kurtosis = -0.23).

1.2.3.2) Organisational culture

The Cronbach alpha for the four questions, determining the organisational culture, is 0.88. The average inter-item correlation is 0.65. The questions for the construct organisation culture are accepted as a valid measure.

The mean for the scores of the construct is 4.05 with a standard deviation of 1.54. The distribution of scores is flat (kurtosis = -0.85) with a slight negative skewness (-0.28).

1.3.) Implementation success

1.3.1) The construct

The Cronbach alpha for the construct implementation success is 0.88. The average inter-item correlation is 0.73. The input for implementation success is accepted as a valid measure.

The mean for the scores of the construct is 3.99 with a standard deviation of 1.52. The distribution of scores is flat (kurtosis = -0.86); with no meaningful deviation in terms of its skewness (skewness = 0.02).

1.3.2) Subscales

1.3.2.1) Satisfaction with the PeopleSoft Administration system

The Cronbach alpha for the four ratings, determining the level of satisfaction with the PeopleSoft system, is 0.96. The average inter-item correlation is 0.87. In this study the questions for the construct satisfaction with the IS system showed consistent results with the original study (alpha = 0.94) and the questions for the construct satisfaction with the IS system is confirmed as a valid measure.

The mean for the scores of the construct is 4.34 with a standard deviation of 1.98. The distribution of scores is flat (kurtosis = -1.07) with a slight negative skewness (-0.16).

The scores for the level of satisfaction with the PeopleSoft system is one of the constructs used in determining the implementation success score.

1.3.2.2) Realised benefits

The Cronbach alpha for the five questions, determining the realised benefits, is 0.90. The average inter-item correlation is 0.64. The questions for the construct realised benefits are accepted as a valid measure.

The mean for the scores of the construct is 3.72 with a standard deviation of 1.59. The distribution of scores is flat (kurtosis = -0.89) with a slight negative skewness (0.11).

The scores for the construct realised benefits are also used in determining the implementation success score.

1.3.2.3) Technology performance

The Cronbach alpha for the five questions, determining the realised benefits, is 0.91. The average inter-item correlation is 0.68. The questions for the construct technology performance are accepted as a valid measure.

The mean for the scores of the construct is 3.92 with a standard deviation of 1.49. The distribution of scores is flat (kurtosis = -0.42) with a non-significant skewness (0.02).

1.3.2.4) Technology utilisation

The scores could not be used as it only reflects the usage of the different users of the PeopleSoft system in their relevant jobs. There is no indication of utilisation as there is no measure of optimal or average use to which actual usage can be compared. A different measure for technology utilisation will have to be developed in future research. The histogram showing the responses is included as Figure 6.

Figure 4.2

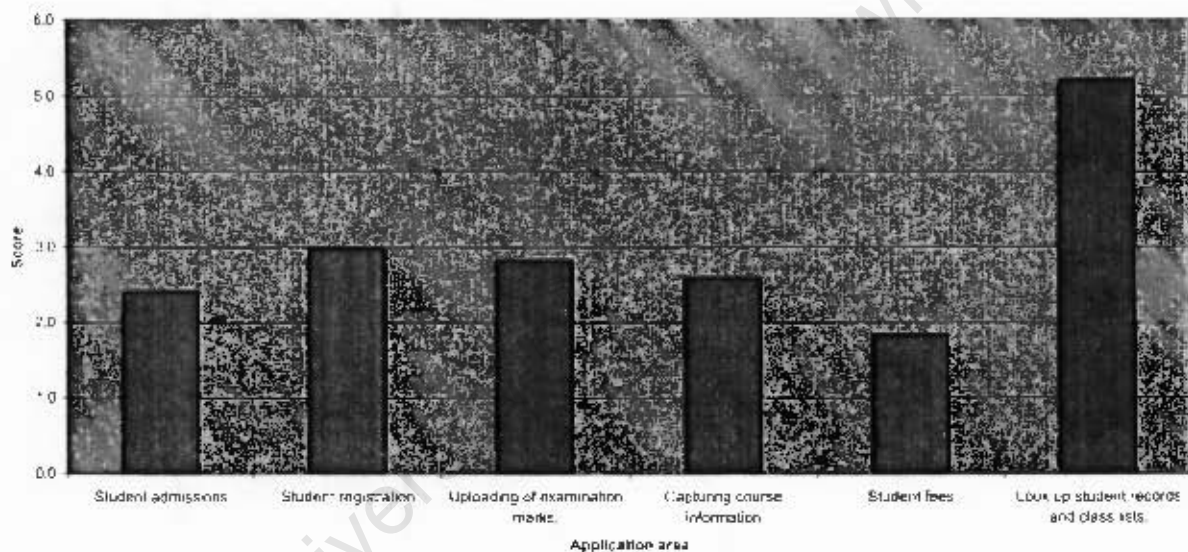


Figure 6 Average scores for Technology utilisation. (n = 90)

2.) Relations

Lippert and Swiercz postulated various relationships between their model's independent variable, technology trust, and the dependent variables. Research question two examined whether

the same relationships exist between dependent and independent variable of the model in a South African context.

A summary of the relationships between the technology trust and the dependent variables is tabled in Table 19.

Table 19

Summary of the research findings of relations between technology trust and the dependent variables ($p \leq 0.05$).

Factor	Factor	Relationship	Comments
Technology Trust	Technology Usability	+0.66	Positive - as predicted.
Technology Trust	Predisposition to Trust	+0.12*	Positive - as predicted.
Technology Trust	Organisational Culture	+0.44	Positive - as predicted.
Technology Trust	Organisational Trust	+0.30	Positive - as predicted.
Technology Trust	Adequacy of training received	+0.25	Positive - as predicted.

*The relationship between technology trust and predisposition to trust was non-significant at $p \leq 0.05$

In order to provide a complete answer to this research question, the relationship between technology trust and IS implementation success was also examined. The relationship of the additional variable adequacy of training received and implementation success was also examined. The results of these two relationships are tabled in Table 20.

Table 20

The relations between implementation success and technology trust and adequacy of training received.

Factor	Factor	Relationship	Comments
Implementation success	Technology Trust	+0.75	Positive - as predicted.
Implementation success	Adequacy of training received	+0.38	Positive - as predicted.

2.1) Technology trust

Technology trust has a strong positive correlation of $r=+0.75$ with implementation success.

The original proposition by Lippert and Swiercz (2005) that higher levels of HRIS technology trust will lead to higher levels of HRIS implementation success, is confirmed. The results show that the proposition also holds true for the student administration system, PeopleSoft, as used in this study, and the proposition can thus be expanded as follows, higher levels of IS technology trust will show a positive relation to IS implementation success.

2.2) Predisposition to trust

The relationship between the construct "Predisposition to trust" and technology trust is non-significant ($r=+0.12$) at $p \leq 0.05$. The direction of the original proposition by Lippert and Swiercz (2005) that individuals that exhibit a greater overall

predisposition to trust will express higher levels of technology trust holds true, but at a non-significant level. The proposition can therefore not be used in this study.

The strong negatively skewed consistent with the high mean score and the large number of high scores resulted in the non-significant relation. A sample with a normal distribution will result in a more significant relationship between the construct "Predisposition to trust" and technology trust. Usually larger samples will lead to less skewed ("normal") distributions.

2.3) Adequacy of training received

The construct adequacy of training received has a positive relation to technology trust of $r=+0.25$. There is a positive relation of 0.38 between adequacy of training and the implementation success scores. The direction of the study's proposition that, individuals that experienced that they have received adequate training will experience higher degrees of trust in IS technology, is confirmed.

2.4) Technology usability

Technology usability showed a strong positive relation to technology trust ($r=0.66$). The direction of the original proposition by Lippert and Swiercz (2005) that higher user perceptions of technology usability are positively related to HRIS technology trust is confirmed.

The results show that the proposition also holds true for the student administration system, PeopleSoft, as used in this study, and the proposition can thus be expanded as follows,

"higher user perceptions of technology usability have a strong positive relationship to IS technology trust".

2.5) Organisational trust

Organisational trust showed a low positive relation to technology trust ($r=+0.30$). The direction of the original proposition by Lippert and Swiercz (2005) that organisations with a high trust culture will experience higher degrees of trust in their HRIS technology is confirmed. The results show that the proposition also holds true for the student administration system, PeopleSoft, as used in this study. The proposition can thus be expanded as follows, organisations with a high trust culture will experience higher degrees of trust in their IS technology.

2.6) Organisational culture

Organisational culture showed a strong positive relation to technology trust ($r=+0.44$). The direction of the original proposition by Lippert and Swiercz (2005) that organisations with a high trust culture will experience higher degrees of trust in their HRIS technology is confirmed. The results show that the proposition also holds true for the student administration system, PeopleSoft, as used in this study, and the proposition can thus be expanded as follows, organisations with a high trust culture will experience higher degrees of trust in their IS.

2.7) Implementation success

Implementation success's relationships with different constructs have been described under their headings. The most important relationship is the one between technology trust and

implementation success that is 0.75. The direction of the original proposition by Lippert and Swiercz (2005) namely that higher levels of HRIS technology trust will lead to higher levels of HRIS implementation success is confirmed. The results show that the proposition also holds true for the student administration system, PeopleSoft, as used in this study. The proposition can thus be expanded as follow, higher levels of HRIS technology trust will lead to higher levels of HRIS implementation success.

3.) Variance contributed by Independent variables

The contribution of the independent variables to the dependent variable of technology trust was examined (as per the third research question).

The results of the multiple regression analysis show that the construct technology usability explains 57.6% of the variance in technology trust. Predisposition to trust does not explain any variance due to the fact that no relation was found between the two constructs. Organisational culture (19,11%) and organisational trust (10,67%) are the other two constructs that were analysed (See Table 21).

Table 21

Multiple regression analysis for dependent variable Technology Trust.

n=90	Beta	Std. Err. Of Beta	B	Std. Err. Of B	T(85)	p-level
Technology usability	0.58	0.08	0.56	0.08	7.03	0.00
Organisational culture	0.19	0.10	0.20	0.10	1.96	0.05
Organisational trust	0.11	0.10	0.11	0.10	1.12	0.27
Predisposition to trust	0.00	0.08	0.00	0.14	0.01	0.99
Adequacy of training	-0.04	0.09	-0.08	0.17	-0.49	0.62

The large and disproportionate percentage of variance explained by technology usability must be further researched to determine whether it is a trend or an isolated occurrence. The supporters of the theory that technological factors are the only determinants of implementation success will the disproportionate percentage of variance explained by the factor technology usability a motivation to disregard all other factors and focus technology factors and at this stage in particular technology usability. This reasoning will be flawed until the full model has been tested thoroughly over different applications, different circumstances and different sample sizes.

Technology usability will have to be compared with the other factors in the technological category to establish whether beta stay as high as the current score when combined with other technological and non-technological factors.

4.) Suggestions for Changes to the Model

The evidence gathered in this research is too limited to suggest any changes to the model. The researcher would like to see further examining of the factor adequacy of training received in similar research and still feels that this factor might be a valid addition to the user category of the model.

5.) Suggestions to Improve Shortcomings in this Study

The strength and direction of the other relationships must be examined as valid instruments to measure the constructs become available.

The construct predisposition to trust must be examined under different conditions to determine whether the findings of this study prevail.

The items to measure the construct adequacy of training received must be investigated further in order to establish a robust measurement for the construct, which will enable researchers to further examine the relationship between the construct and technology trust and implementation success.

The disproportionate contribution that the construct technology usability makes to technology trust must be researched in more depth and in different applications. This finding, if it holds true in different circumstances might prove to be the missing link in technology trust and implementation success.

Other non-HRIS application implementations must be researched to confirm the generalisability of the technology trust model.

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I expect if:

9. I have faith that the Peoplesoft Student Administration System will function as

Strongly Disagree

when I need it.

8. I can rely on the Peoplesoft Student Administration System to be working

Strongly Disagree

7. I think the Peoplesoft Student Administration System is predictable.

Strongly Disagree

1-7 by selecting the number that is appropriate for you. please indicate the extent to which you agree with the following statements about the Peoplesoft Student Administration system, on a scale of

5. Technology Trust

6. I have confidence in the system.

Strongly Disagree

5. The system supplies me to input and retrieve accurate data.

Strongly Disagree

4. I feel that I have control over information in the system.

Strongly Disagree

3. The Peoplesoft Student Administration System is easy to understand.

Strongly Disagree

2. The Peoplesoft Student Administration System is quick to use.

Strongly Disagree

1. The Peoplesoft Student Administration System is easy to use.

Strongly Disagree

1-7 by selecting the number that is appropriate for you. please indicate the extent to which you agree with the following statements about the Peoplesoft Student Administration system, on a scale of

4. Technology Usability

THANK YOU FOR YOUR TIME

When you have completed filling in the form please press the submit button

Questionnaire

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10. I have a high degree of confidence that PeopleSoft Student Administration System will be working when I need it.

1 Strongly Disagree ▼

3. Predisposition to Trust

Please indicate the extent to which you agree with the following statements about the PeopleSoft Student Administration system, on a scale of 1-7 by selecting the number that is appropriate for you.

11. I believe that most people are generally well intentioned.

1 Strongly Disagree ▼

12. I think that most people I deal with are honest and trustworthy

1 Strongly Disagree ▼

13. My first reaction is to trust people

1 Strongly Disagree ▼

14. I tend to assume the best about people

1 Strongly Disagree ▼

15. I have a good deal of faith in human nature

1 Strongly Disagree ▼

4. Organisational Culture

Please indicate the extent to which you agree with the following statements about the PeopleSoft Student Administration system, on a scale of 1-7 by selecting the number that is appropriate for you.

16. The University's leaders take responsibility for their decisions.

1 Strongly Disagree ▼

17. I am satisfied with the way in which decisions about information systems are made in the University

1 Strongly Disagree ▼

18. Information about important information systems issues are shared openly with staff

1 Strongly Disagree ▼

19. The University's leaders give consistent messages about UCT's information systems priorities

1 Strongly Disagree ▼

5. Organisational Trust

Please indicate the extent to which you agree with the following statements about the PeopleSoft Student Administration system, on a scale of 1-7 by selecting the number that is appropriate for you.

20. I believe my employer has high integrity.

1 Strongly Disagree ▼

21. I can expect my employer to treat me in a consistent and predictable fashion.

1 Strongly Disagree ▼

22. My employer is always honest and truthful.

1 Strongly Disagree ▼

23. In general, I believe my employer's motives and intentions are good.

1 Strongly Disagree ▼

24. I think my employer treats me fairly.

1 Strongly Disagree ▼

25. My employer is open and upfront with me.

	1 Strongly Disagree ▾
26. I fully trust my employer.	1 Strongly Disagree ▾
6. Satisfaction with PeopleSoft Student Administration System	
Please rate your feelings with respect to experience of the PeopleSoft Student Administration System since you were first introduced to it.	
1. Displeased/Pleased	1 Displeased ▾
2. Sad/Happy	1 Sad ▾
3. Disgusted/Contented	1 Disgusted ▾
4. Dissatisfied/Satisfied	1 Dissatisfied ▾
7. Realised Benefits	
Please indicate the extent to which you agree with the following statements about the PeopleSoft Student Administration system, on a scale of 1-7 by selecting the number that is appropriate for you.	
27. It saves me time.	1 Strongly Disagree ▾
28. It is accurate.	1 Strongly Disagree ▾
29. It produces good reports.	1 Strongly Disagree ▾
30. It increases my productivity.	1 Strongly Disagree ▾
31. It assists me in good decision-making,	1 Strongly Disagree ▾
8. Technology Performance	
How would you rate the PeopleSoft Student Administration System on these performance issues?	
32. It produces accurate information.	1 Poor ▾
33. It is always available to use.	1 Poor ▾
34. It processes transactions fast.	1 Poor ▾
35. It integrates well with other relevant applications.	1 Poor ▾
36. It is a reliable system.	1 Poor ▾

9. Adequacy of Training Received

Please rate the statements about the adequacy of training received, on a scale of 1-5 by selecting the number that is appropriate for you.

37. I received adequate training on the PeopleSoft Student Administration System.	1 Strongly Disagree ▾
38. The training I received was relevant to my tasks and responsibilities.	1 Strongly Disagree ▾
39. I need more training to enable me to do my job properly.	1 Strongly Disagree ▾
40. The 'help documentation' on the system covers all the relevant topics.	1 Strongly Disagree ▾
41. The 'help documentation' on the system is user friendly and easy to use.	1 Strongly Disagree ▾
42. The 'troubleshooting guides' from ICTS helpdesk staff are a real help.	1 Strongly Disagree ▾

10. Technology Utilisation

Please indicate to what extent do you use the following features of the PeopleSoft Student Administration System in your job, on a scale of 1-7 by selecting the number that is appropriate for you (or indicate if a feature is not used in your job).

43. Student admissions	0 Not used in my job ▾
44. Student registration	0 Not used in my job ▾
45. Uploading of examination marks	0 Not used in my job ▾
46. Capturing course information	0 Not used in my job ▾
47. Student fees	0 Not used in my job ▾
48. Look up student records and class list	0 Not used in my job ▾
49. Other	

11. Personal Information

Please provide us with the following details to add job profiling to the analysis of our study. Remember, your response will remain strictly confidential.

1. Gender	Male ▾
2. Number of years in current position?	Less than 1 year ▾

12. (Lucky Draw)

There is a lucky draw for people who have completed the questionnaire. You can choose whether you would like to have a facial or a data key.

In order to do the lucky draw, the webmaster will use your e-mail address. Thereafter he will delete all identifying information from the data file. The data we as researchers receive will be anonymous.

Your Email Address

By submitting this questionnaire to the researcher, you acknowledge that you are participating in this study of your own free will.


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Summary of the source and number of questions of the questionnaires used in the research.

Questionnaires	Source	Number of Questions
Technology trust	Lippert and Swiercz (2005).	4
Predisposition to trust	Rotter (1967).	5
Technology usability	Lippert and Swiercz (2005)	6
Organisational trust	Robinson (1996).	7
Organisational Culture	Selected items from the UCT survey for Organisational culture.	4
Adequacy of training received	Researcher's own questionnaire	6
Satisfaction	Lippert (2005)	4
Realized Benefits	Researcher's own questionnaire	5
Technology Performance	Lippert, Adjusted (2005)	5
Utilization	Researcher's own questionnaire	6