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TO WHOM IT MAY CONCERN

The papers accepted for the 9th Annual Conference on World Wide Web Applications held on 5-7 September 2007 in Johannesburg have been peer-reviewed by external reviewers.

The evaluation process was as follows:

Phase 1: A *Call for Papers* was published and abstracts received.

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Phase 4: Authors of those papers selected were notified that their papers (with or without amendments) were added to the final programme of the Conference.

Phase 5: Papers were reformatted to PDF and published digitally in the permanent Conference Website (http://www.zaw3.co.za)

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Antecedents and consequences of trust in Internet banking: a South African perspective

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Abstract

From its early inception in the late 1990s, Internet banking as a channel has grown substantially, to the point where there are now over one million subscribers in South Africa. There have been several reports of security breaches and bank scams over this channel through the years. As a consequence, banks have to continually build trust and assure customers of the safety and security of transacting online. Consumer trust in Internet banking has therefore been recognised as important to retain and grow the customer base. The purpose of this research was to examine consumer trust with regards to Internet banking and to identify its antecedents and consequences. Key studies on B2C e-commerce have shown that the primary antecedents of consumer trust are knowledge-based familiarity calculative-based beliefs, situational normality, structural assurances, and perceived ease of use. The major consequences are heightened perceptions of the channel's usefulness, the consumer's intended use, the willingness to continue using the service and greater usage. In this study, a group of 41 Internet banking users participated in a survey in which they were asked about their banking habits, their level of trust in Internet banking, and the aforementioned antecedents and consequences. The results showed that structural assurances and perceived ease of use were the primary influences on trust, whilst continuance intention was the primary consequence. Other findings confirm well-known technology acceptance model (TAM) relationships whereby perceived usefulness is a key influence on intended use, continuance intention and usage, with perceived ease of use indirectly affecting intentions through perceived usefulness. Another interesting finding was that situational normality and knowledge-based familiarity did not have a direct influence on trust, but did so indirectly through perceived ease of use.

Keywords: Internet banking, trust, adoption.

1. Introduction

During the late nineties, Internet banking was punted by some as a channel that would lead to the demise of traditional face to face retail banking, and to the rise of virtual banks with no brick and mortar presence (Leonard, 2002). This has clearly not happened, with the Internet now accepted as one of several electronic channels banks may use to reach their customer base (Economist, 2000). Others include the ATM, telephone banking and

cell phone banking. In South Africa, there are estimated to be over 1 million Internet banking subscribers (World Wide Worx, 2004) out of a total of about 14 million bank account holders (FinMark Trust, 2005). This translates to about 10% of all bank customers. These online bank customers constitute a large proportion of the estimated 3.6 million Internet users in South Africa (World Wide Worx, 2005). The typical Internet banking user in South Africa is a middle or high income earner who very often has Internet access at home and/or work (Brown & Buys, 2005). A lack of trust in Internet banking has been cited as one of the main reasons holding back further usage of this service (Nilsson et al., 2005). There have been increasing reports of security breaches and intrusions through Internet banking, leading customers to question the credibility of the channel (Nilsson et al., 2005). Building trust in Internet banking is therefore a perennial concern for banks to ensure they realise the benefits of providing this channel (Aladwani, 2001).

Given this problem of lack of trust, the research question arises as to what can be done to increase levels of trust amongst consumers? Having increased levels of trust, a further research question is then, what are the consequences of this increased trust? The main purpose of this study is therefore to identify factors that influence trust in Internet banking (antecedents), and the consequences of building trust. By identifying antecedents, it can be better understood how to increase trust levels amongst wary consumers. The consequences of trust can then be determined to understand the benefits that accrue from trust-building measures.

In the next section, the conceptual background to the study is laid out and the hypotheses and research framework developed. Following this the research procedure is explained, and the results reported. These results are analysed and discussed before the paper is concluded.

2. Conceptual background

In this section, the concept of trust in Internet banking is discussed in more detail, following which antecedents and consequences of trust are identified. In the process, research hypotheses are formulated, these being integrated into a research framework for the study.

2.1 Trust in Internet banking

The concept of trust has been widely researched in the context of e-commerce (Brown et al., 2006; Pavlou & Fygenson, 2006; Van Slyke et al., 2004). Several studies have investigated this phenomenon with regards to Internet banking specifically (Eriksson & Nilsson, 2005; Kim & Prabhakar, 2004; Suh & Han, 2002). Trust has been recognised as a complex and multi-dimensional concept, making it difficult for a single simple definition to be provided (Kim and Prabhakar, 2004). Gefen et al. (2003) distinguish between trusting beliefs, and trusting behaviours (e.g., usage of Internet banking). In this study, trust is defined in terms of the set of specific beliefs a customer has about the Internet bank, as was done by Gefen et al. (2003) with respect to online shopping. Other studies on Internet banking, have similarly adopted this posture on trust (Kim and Prabhakar, 2004; Suh & Han, 2002). Salam et al. (2005) make note of four common trusting beliefs – trust in the benevolence of the vendor, competence of the vendor, integrity of the vendor, and predictability of the vendor respectively.

2.2 Antecedents of trust

Gefen et al. (2003) highlight several antecedents of trust in online shopping. These include knowledge-based familiarity, calculative-based beliefs, situational normality, structural assurances, and perceived ease of use (Gefen et al., 2003). The concepts are defined in Table 1 below.

Table 1: Antecedents of trust (Gefen et al., 2003)

Antecedents of Trust	Definition
Knowledge-based familiarity	A trust antecedent that suggests, "*the development of trust between parties requires time and an interaction history*" (p. 63).
Calculative-based beliefs	"*The recognition that the trusted party has nothing to gain from not being trustworthy builds trust. This approach to trust is based on the assumption that while other people may not be necessarily good, they are rational, calculative, act in their own best self-interest, and, as such will refrain from inflicting harm upon themselves*" (p. 64).
Situational Normality	"*An assessment that the transaction will be a success, based on how normal or customary the situation appears to be*" (p. 64).
Structural Assurances	"*An assessment of success [of a transaction] due to safety nets such as legal recourse, guarantees, and regulations that exist in a specific context*" (p. 64)
Perceived Ease of Use	"*The degree to which a person believes that using a particular system would be free of effort*" (Davis, 1989, p. 320).

Based on Gefen et al. (2003), the following set of hypotheses concerning these antecedents are suggested:
H1: Familiarity with a trusted Internet bank positively influences Trust in Internet banking.
H2: Calculative-Based Beliefs positively influence Trust in Internet banking.
H3: Perceptions of Situational Normality positively influence Trust in Internet banking.
H4: Perceptions of Structural Assurances built into an Internet banking web site positively influences Trust in Internet banking.
H5: Perceived Ease of Use positively influences Trust in Internet banking.

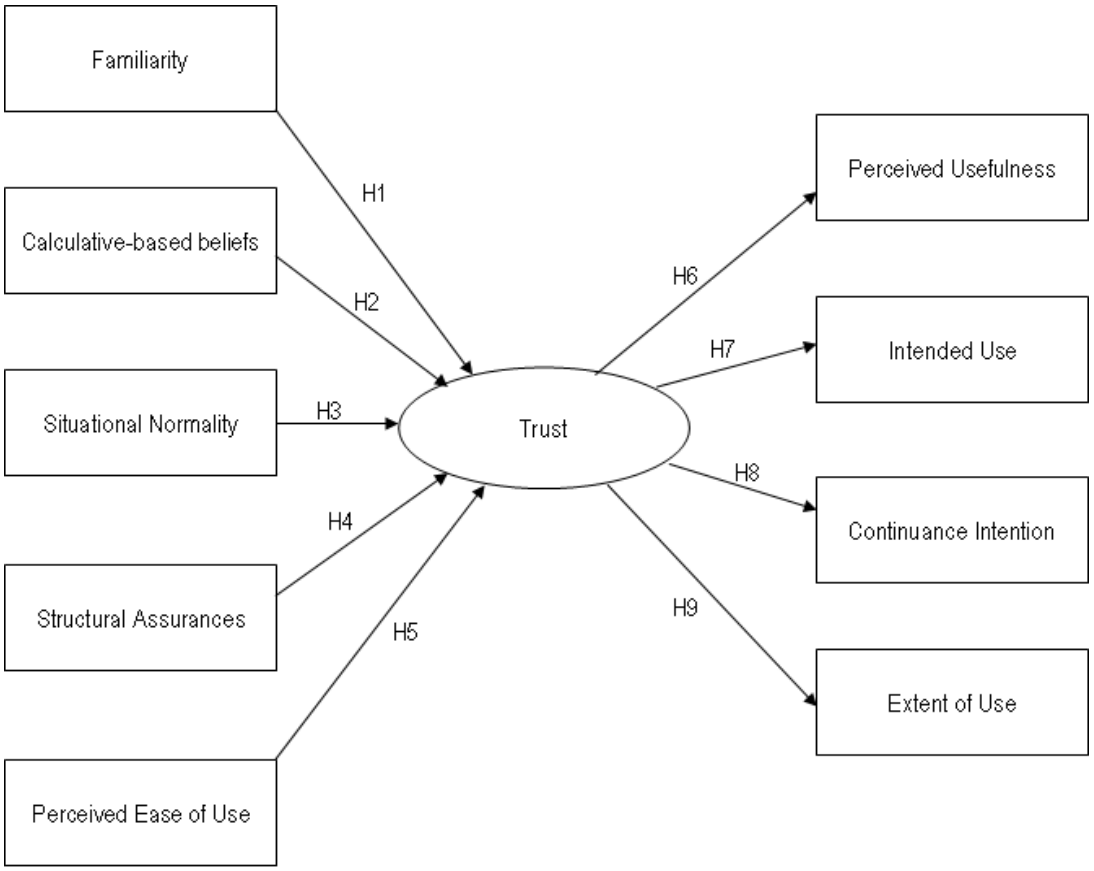
2.3 Consequences of trust

The consequences of trust have been recognised as heightened perceptions of usefulness of Internet banking (Eriksson & Nilsson, 2005; Gefen et al., 2003; Suh & Han, 2002); greater levels of intended use (Gefen et al., 2003; Suh & Han, 2002); greater levels of actual usage (Kim & Prabhakar, 2004), and greater likelihood of continued usage of Internet banking (Jayakody, 2004). These assertions suggest the following hypotheses:
H6: Trust in Internet banking positively influences its Perceived Usefulness.
H7: Trust in Internet banking positively influences Intended Use of Internet banking
H8: Trust in Internet banking positively influences Continuance Intentions
H9: Trust in Internet banking positively influences the Extent of its Usage.

2.4 Research framework

The hypotheses H1 to H9 are illustrated in Figure 1 below.

Figure 1: Antecedents and consequences of trust in Internet banking



3. Research procedure

The research was positivistic, quantitative and hypothetico-deductive in nature. The target population was those who used Internet banking in South Africa. Typical Internet banking users are tertiary educated professionals with a medium to high income (Brown & Buys, 2005). Prior studies have tended to use MBA and postgraduate business students as proxies, given that they fit the profile of the typical Internet banking user (Brown & Buys, 2005). In this study an attempt was made to reach people at their place of work. Convenience sampling was employed, whereby respondents residing in Cape Town were targeted. Several organisations with offices in Cape Town were approached to request that questionnaires be distributed. Two IT organisations responded positively.

The questionnaire used the instrument developed by Gefen et al. (2003) to measure knowledge-based familiarity (3 items); calculative-based beliefs (3 items), situational normality (3 items); structural assurances (4 items), perceived ease of use (6 items), perceived usefulness (6 items), trust (7 items) and intended use (2 items). A single-item measure drawn from Bhattacherjee (2001) was used to assess continuance intentions. All items employed a 7-point Lickert scale anchored by "*Strongly Disagree*" (represented by 1)

at one end to "*Strongly Agree*" (represented by 7) at the other. The extent of usage scale was assessed by determining the extent to which respondents made use of 5 key Internet banking services (Brown & Buys, 2005).
The questionnairee was piloted with a small number of participants. The main purpose was to assess whether the questionnaire was easy to understand and appropriate for the research that was to be conducted. The amended questionnaire based on the pilot participants' feedback was then distributed to participants in candidate organisations. Further details are provided in Bradley (2004).

4. Data analysis and results

4.1 Demographic profile

The demographic profile of respondents is displayed in Table 2. Of the 41 respondents, 75.6% were male. This male bias was due to the sample being drawn from 2 IT companies. The IT industry still tends to be dominated by males. The majority of respondents were under 40 (75.6%), with on average the monthly income of the group being in the R15,001 to R20,000 range, excluding those who preferred not to answer this question. Most respondents had some level of tertiary education, a diploma or a degree (85.4%). The vast majority (90%) banked with a major retail bank, i.e. Standard, FNB, Absa or Nedbank.

Table 2: Demographic profile

	Count	**Percent**
Gender		
Female	10	24.4
Male	31	75.6
Age		
18-29	12	29.3
30-39	19	46.3
40-49	7	17.1
50-59	2	4.9
60+	1	2.4
Monthly Income		
< R 2,000	0	0.0
R 2,001 - 4,000	0	0.0
R 4,001 - 7,000	1	2.4
R 7,001 – 10,000	5	12.2
R 10,001 – 15,000	9	22.0
R 15,001 – 20,000	7	17.1
R 20,000+	11	26.8
Prefer not to answer	8	19.5
Highest Education		
High School/Matric/A level	4	9.8
Tertiary Education	9	22.0
Diploma	12	29.3
Degree/Honours	14	18.7
Masters	1	2.4
Other	2	4.9

4.2 Validity and reliability tests

Prior to hypothesis testing, the validity and reliability of the multiple-item measures were determined. Factor analysis with varimax rotation (eigenvalue set to 1) was used to assess construct validity. As in Tan & Teo (2000), to demonstrate validity, items were expected to load highest on their own factors (with a minimum loading of 0.4) and lower on all other factors. In the first round of factor analysis the multiple-item (3 or more items) measures were included, i.e. calculative-based beliefs (CB1 to CB3), structural assurances (SA1 to SA4), situational normality (SN1 to SN3), knowledge-based familiarity (FB1 to FB3), perceived ease of use (PEOU1 to PEOU6), trust (TR1 to TR7) and perceived usefulness (PU1 to PU6). Several items did not load on their respective factors, and so were dropped. After dropping items, factor loadings as shown in Table 3 below were achieved. This second round analysis demonstrated validity for the constructs of Structural Assurances (SA2 to SA4); Perceived Usefulness (PU3 to PU6); Situational Normality (SN1 to SN3); Calculative-based Beliefs (CB1 to CB3); Familiarity (FB2 to FB3), Trust (TR1 to TR6); and Perceived Ease of Use (PEOU1 to PEOU6).

Table 3: Factor analysis

	Structural Assurances	Perceived Usefulness	Situational Normality	Calculative-based beliefs	Familiarity	Trust	Perceived Ease of Use
PEOU1	0.28	0.08	0.09	0.06	0.06	0.17	***0.81***
PEOU2	0.11	0.18	0.25	0.21	0.33	0.30	***0.64***
PEOU3	0.27	0.40	0.19	0.29	0.23	0.17	***0.67***
PEOU4	0.21	0.25	0.33	-0.06	0.23	0.23	***0.73***
PEOU5	0.06	0.27	0.09	0.08	-0.01	0.19	***0.89***
PEOU6	0.18	0.22	0.19	0.07	0.21	0.30	***0.80***
PU3	-0.09	***0.82***	0.11	-0.04	-0.11	-0.12	0.35
PU4	0.03	***0.91***	0.09	0.23	-0.05	0.03	0.26
PU5	0.04	***0.94***	0.00	0.03	0.01	-0.02	0.21
PU6	-0.15	***0.74***	0.15	0.07	0.30	0.34	-0.04
TR1	0.18	0.11	0.47	-0.17	0.06	***0.61***	0.37
TR2	0.52	0.12	-0.08	0.11	-0.04	***0.58***	0.25
TR3	0.31	-0.09	-0.10	0.21	-0.04	***0.71***	0.30
TR4	0.33	0.32	-0.03	0.23	0.24	***0.55***	0.36
TR5	-0.06	-0.01	-0.06	0.01	-0.03	***0.76***	0.23
TR6	0.49	0.04	0.05	0.26	-0.05	***0.74***	0.06
CB1	0.11	0.11	-0.01	***0.77***	0.23	0.30	-0.04
CB2	0.00	0.06	0.18	***0.91***	0.03	0.04	0.11
CB3	-0.06	0.08	0.17	***0.89***	-0.21	0.01	0.18
FB2	0.17	-0.09	-0.03	0.07	***0.84***	-0.11	0.17
FB3	-0.12	0.11	-0.02	-0.06	***0.78***	0.05	0.19
SA2	***0.86***	0.00	0.14	-0.04	-0.25	0.08	0.09
SA3	***0.78***	-0.10	0.14	0.05	0.25	0.17	0.33
SA4	***0.79***	-0.08	0.16	-0.05	0.20	0.29	0.25
SN1	0.04	0.04	***0.91***	0.10	0.07	0.11	0.08
SN2	0.14	0.05	***0.87***	0.08	-0.12	-0.14	0.21
SN3	0.12	0.16	***0.88***	0.23	0.00	-0.07	0.21
Expl.Var	3.11	3.53	3.04	2.72	2.02	3.36	4.60
Prp.Totl	0.12	0.13	0.11	0.10	0.07	0.12	0.17

Reliability of the refined instrument was assessed using the Cronbach alpha test. Constructs are deemed reliable if the Cronbach alpha coefficient is at least 0.6 (Tan and Teo, 2000). Table 4 shows that all the multiple-item measures met this minimum criteria, and were therefore deemed reliable.

Table 4: Reliability analysis

Construct	No. of Items	Cronbach Alpha
Knowledge-based Familiarity	2	0.65
Calculative-based Beliefs	3	0.86
Situational Normality	3	0.92
Structural Assurances	3	0.87
Perceived Ease of Use	6	0.95
Trust	6	0.87
Perceived Usefulness	4	0.91
Intended Use	2	0.6

4.3 Hypotheses testing

To test the hypotheses, correlation coefficients between the variables were determined. The use of correlation analysis rather than multiple regression analysis was justified, given that there were only 41 respondents. When there are only a small number of respondents, correlation analysis is a more appropriate technique (Brown et al., 2006). The correlation matrix is illustrated in Table 5 below. The correlations highlighted in bold italics are significant at $p < 0.05$.

Table 5: Correlation Matrix

	Usage Extent	Continuance Intention	Intended Use	Perceived Ease of Use	Perceived Usefulness	**Trust**	Calculative-based Beliefs	Familiarity	Structural Assurances	Situational Normality
Usage Extent	1.00	0.08	0.23	0.29	***0.31***	**0.16**	0.15	***0.45***	0.13	0.18
Continuance Intention		1.00	0.05	***0.34***	***0.36***	***0.35***	0.04	0.02	0.21	0.02
Intended Use			1.00	***0.33***	***0.36***	**0.20**	***0.54***	0.08	0.18	0.28
Perceived Ease of Use				1.00	***0.48***	***0.60***	0.28	***0.32***	***0.49***	***0.39***
Perceived Usefulness					1.00	**0.21**	0.21	0.11	-0.02	0.22
Trust						**1.00**	**0.30**	**0.11**	***0.58***	**0.13**
Calculative-based Beliefs							1.00	0.03	0.08	0.27
Familiarity								1.00	0.10	0.02
Structural Assurances									1.00	0.28
Situational Normality										1.00

From the correlation matrix it can be seen that of the 5 antecedents hypothesised as influences on trust only structural assurances (with a coefficient of 0.58) and perceived ease of use (coefficient of 0.6) were significantly related to trust. There is thus support for hypotheses H4 and H5. In terms of the consequences of trust, the only significant relationship was with continuance intention (coefficient of 0.35), supporting hypothesis H8. The three hypotheses supported are therefore as follows:

- *Perceptions of Structural Assurances built into an Internet banking web site positively influences Trust in Internet banking (H4).*
- *Perceived Ease of Use positively influences Trust in Internet banking (H5).*
- *Trust in Internet banking positively influences Continuance Intentions (H8).*

5. Discussion, implications and conclusion

A relatively small group of respondents was used in this study. As a consequence only the most significant relationships emerged. In terms of antecedents to trust, these were structural assurances and perceived ease of use. The implications for banks are that there should be greater emphasis placed on assuring customers of the security and integrity of Internet banking websites. Displaying security certificates and statements of guarantee are some ways of providing structural assurances. Other structural assurances include clear contact details for technical and other support that a customer may need. For banks that allow portals to provide links to their website, they need to ensure that the portals and virtual malls they partner with are well-known and reputable (Gefen et al., 2003).

In terms of enhancing perceived ease of use, banks need to continually improve the usability, navigability and understanding of their websites (Lederer et al., 2000). When redesigning websites they need to be wary of changing features and layouts that customers are familiar with, as this could lead to reduced perceptions of ease use, which ultimately impacts on trust.

The major consequence of trust was found to be continuance intentions. This may be because the sample consisted of those who had already been using Internet banking. Experience has been shown to moderate the strength of relationships between factors such as perceived ease of use and intended use or actual use (Venkatesh et al., 2003). The same moderating effect may apply to the relationship between trust and factors such as perceived usefulness, intended use and extent of use. The greater the experience of the customer, the less likely that trust will influence these factors. Rather trust is a key variable in determining whether customers continue with their current level of use, or decide to discontinue usage.

Other significant relationships included those from perceived usefulness to intended use, continuance intentions and extent of usage respectively. Also, perceived ease of use was related to perceived usefulness, intended use, and continuance intentions. These relationships validate the TAM theory (Davis, 1989). Although there were no direct relationships found from situational normality and familiarity to the trust variable, there were indirect relationships through perceived ease of use. Gefen et al. (2003) also recognised these indirect relationships. Future research can build on this study by identifying additional consequences and antecedents of trust, making use of a broader more diverse sample.

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