African Journal of Business Management Vol. 5(13), pp. 5109-5117, 4 July, 2011
Available online at http://www.academicjournals.org/AJBM
DOI: 10.5897/AJBM10.822
ISSN 1993-8233 ©2011 Academic Journals

Full Length Research Paper

Business-to-consumer e-commerce in Nigeria: Prospects and challenges

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Accepted 14 January, 2011

The growth of Internet usage in Nigeria continues to increase, recording over 90% growth rate between 2000 and 2008. While businesses in Nigeria are reported to have online access with opportunity for e-commercial activities, customers in the country however access business websites only to source for information but make purchases the traditional way. This paper aims at assessing the prospects and challenges of Business-to-consumer (B2C) e-commerce implementation in Nigeria from the consumers' perspective. Survey research was adopted for this study. Research hypotheses were formulated and questionnaire designed and administered randomly to 900 respondents. Collected data was used to evaluate the acceptance of B2C e-commerce using the extended technology acceptance model (TAM). The extended TAM combines task-technology fit, relationship related construct: trust and risk, and the two TAM constructs to determine factors influencing consumer acceptance of B2C e-commerce in Nigeria. Findings revealed that there are significant relationships between the model variables. Task-technology fit and perceived usefulness have significant relationships with intentions to use, having a correlation coefficient of 0.2623 and 0.2002 respectively. Similarly, the interrelationship among trust, perceived risk, and behavioral intention are significant. The effect of risk on trust was statistically showing that risk is a predictor of trust. Risk has a high significant on trust and trust in turn has low significant effect on behavioral intention. Adding TTF and its relationships to the TAM also fit the data. The relationship between task-technology fit, perceived ease of use, perceived usefulness and intention are significant.

Key words: TAM, trust, Risk, B2C e-commerce, Consumer, Internet, and task-technology fit.

INTRODUCTION

E-commerce is the use of the Internet for marketing, identification, payment and delivery of goods and services. Through the e-commerce technology, the Internet has revolutionized the mode of business transactions by providing consumers with the ability to bank, invest, purchase, distribute, communicate, explore, and research from virtually anywhere, anytime where there is Internet access (Anup, 1997). Most importantly, it has created electronic markets and provided opportunities for businesses to reach consumers in a very direct way. Also by virtue of the technology, it has enabled consumers' immediate access to these electronic markets.

Nigeria is the fastest growing telecommunication country in Africa (Ayo et al., 2007). The growth of a number of Internet users from year 2000 to 2010 is sporadic as it recorded 21,891.1% growth rate! According to the Internet World Start (2010), there were 200,000 internet users in Nigeria in year 2000. This number is however less than 1% of the national population (precise 0.1%). In the year 2006 – the number has grown to 5,000,000 (again just 3.1% of the national population). This figure doubled in 2008 with 10million people having access to the Internet. In 2009, the figure went above double as 23,982,000million people used Internet in Nigeria. By June 2010, the number of internet users in Nigeria has grown to 43,982,200 that is 29.5% of the country's population. The increasing users of internet in Nigeria from 0.1% in 2000 to 29.5% of its population in

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June 2010, revealed that the use of internet in the country is growing at a sporadic rate and still has the potential to grow higher.

Despite the growth of internet users in Nigeria, much research work has not been done in accessing the B2C e-commerce activity. Presently, many online shopping sites are thriving in Nigeria, servicing thousands of searchers every week. Some of them are: www.234world.com, Xtaples.net, www.booksng.com, www.orderbay.com. Some of these sites make the transaction process so easy buyers to forget about the open market. A site like 234world.com allows buyer to pay to a designated bank account after making online purchases. The items purchased are then shipped to the buyer at the speed of light. SoftPay allows individual to receive money online and thereafter use it to pay for purchases made. It even helps online shopping sites to collect payment for purchases made. Considering all these, it is expected that the number of people engaging in e-commerce activity will increase. E-commerce has however not been widely tapped into. Many Nigerians still treat its benefits with deep skepticism. They do not believe that e-commerce transactions could be successfully conducted.

While there is proliferation of Internet usage, e-payment systems and online presence of businesses, much work has not been done about business-to-consumers activities. There is need to understand how and why people participate in e-commerce activities.

Therefore, the objective of this study is to assess the prospect and challenges of Business-to-Consumer (B2C) e-commerce implementation in Nigeria from the consumers' perspective. The study treats consumer e-commerce as a technology adoption process and evaluates the suitability of extended technology acceptance model to determine factors that might explain e-commerce adoption among consumers in Nigeria.

LITERATURE REVIEW AND HYPOTHESES

The technology acceptance model and online shopping

Technology acceptance model (TAM) is currently the most effective tool for describing information systems adoption. It was developed by Davis (1989) to explain and predict computer-usage behaviour. It has it's theoretical root in theory of reasoned action (TRA) (Fishbein et al., 1975). TRA depicts that beliefs influence attitudes, which lead to intentions, and finally to behaviours. The TRA introduced two independent determinants, attitude towards behaviour and subjective norm. Attitude toward behaviour refers to the degree that an individual has a positive or negative reaction towards a specific behaviour. Normative beliefs consider the probability that important persons or groups approve or disapprove of disapperforming a specific behaviour. According to the TRA, individuals' attitudes towards behaviours are determined by their most important beliefs and the consequences of performing specific behaviours. As Fishbein et al. (1975) demonstrated through their theory, behaviour is best predicted by intentions, and intentions are jointly determined by the person's attitude and subjective norm concerning the behaviour.

TAM's proposition posits two constructs: Perceived usefulness (PU) which is defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance" and perceived ease of use (PEOU), which refers to the degree to which the prospective user expects the target system to be free of effort (Davis et al., 1989). Both perceived usefulness and perceived ease of use have been used in examining users' acceptance of information systems. Perceived usefulness has been proven consistently as significant in attitude formation (Moon et al., 2000; Venkatesh, 2000; Venkatesh et al., 2000).

TAM has also been employed to predict consumers' adoption of Web technology (Pavlou, 2003; Tang et al; Klopping and Mckinney, 2004). Lee et al. (2001) extended TAM with perceived risk (PR). They found that the TAM predicted individual purchasing behaviour online and that perceived risk affects perceived usefulness. Chen et al. (2002) also found TAM effective in evaluating online shopping at "virtual" on-line store.

Building on these empirically validated views, the TAM is suitable for determining e-commerce but may not fully determine the users' intention to adopt the technology. Therefore, the study proposes an extended TAM, with integration of task-technology fit model, trust, and perceived risk to better predict consumers' adoption of e-commerce. The original TAM was also modified by dropping perceived ease of use – perceived usefulness the path based on previous e-commerce adoption studies which argued that Web tools are exceptionally easy to use (Klopping et al., 2004). Also, to simplify TAM, the attitude construct was dropped and focused on the relationship between perceived usefulness and perceived ease of use on intention to use.

Adding task-technology fit to TAM

Davis' technology acceptance model (TAM) and the task–technology fit model (TTF) developed by Goodhue (1995), provided sufficient theoretical basis for exploring the factors that explain software utilization and its link with user performance. These models though differ from each other, offer similar perspectives on utilization behaviour. TAM focuses on the attitudes toward using a particular IT which users develop based on perceived usefulness and ease of use. TTF focuses on the match between user task needs and the available functionality of the IT. The core of a task-technology fit is a formal

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construct known as task-technology fit (TTF), which is the matching of the capabilities of the technology with the demands of the task, that is, the ability of IT to support a task (Goodhue et al., 1995).

Earlier adopters of TTF model have successfully applied it to predict users' adoption of information system in accounting and decision support system (Michael, 2008; Benford et al., 2000; Zigurs et al., 1999). Usoro (2010) reported a successful combination of TTF and TAM to predict users' adoption of e-tourism. Dishawa et al. (2002) proposed a combination of TAM and TTF to predict adoption of workplace technology. The use of TAM and TTF in consumer e-commerce adoption is found in the work of Klopping et al. (2004) and Sun et al. (2007). Dishawa and Strong (1999) earlier reported that TTF is more effective than TAM for predicting usage in work-related tasks; however, their study concluded that a combination of TTF and TAM into one extended model is superior to either of the models alone. Also, their study revealed that TTF affects perceives ease of use and actual use.

Trust and TAM

Trust is a belief that one can rely upon a promise made by another (Pavlou, 2003). Stewart et al. (2001) defines trust in electronic commerce as the subjective probability with which consumers believe that an online transaction with a web retailer will occur in a manner consistent with their expectations. Scholars have identified lack of trust as one of the main reasons for consumers' cynicism towards electronic commerce. In the context of e-commerce, trust beliefs include the online consumers' beliefs and expectancies about trust-related characteristics of the online seller (McKnight and Chervany, 2002). The online consumers desire the online sellers to be willing and able to act in the consumers' interests, to be honest in transactions (not divulging personal information to other vendors), and to be capable of delivering the ordered goods as agreed.

According to Mahmood (2004), the trust factor has significant positive contributions to consumers' online shopping behaviour. Jiang et al (2008) argued that consumer trust is a critical enabler of successful online retailing and knowledge is one important factor influencing the level of trust. The work of Gefen (2003) and Al-Dwairi et al. (2009), among others presented an integrated trust model with the technology acceptance model for business-to-consumer (B2C) e-commerce.

Perceived risk and TAM

Risk is defined as "the state of being open to the chance of injury or loss" (Bernard, 1989). Logically following on from this definition, perceived risk is the subjective probability that loss or injury will occur. In the context of online transactions, consumers are likely to perceive risks when they are uncertain about the probability of occurrence for each possible outcome for the transaction (Stone and Gronhaug, 1993). Perceived system risk is the overall amount of uncertainty perceived by an organization in a particular purchase situation. The perceived risk associated with online transactions may reduce perceptions of behavioral and environmental control, and lack of control is likely to negatively influence e-commerce usage intentions (Pavlou, 2003). These possible outcomes, both negative and positive, will affect consumers' intention to transact with a B2C EC system. TAM's proposition tends to focus on the positive aspects of technology use – usefulness and ease of use, and less on the immediate loss that could result from usage. This weakens the argumentative power of TAM in situations where potential loss due to usage is a concern. Therefore, there is the need for an extended TAM to include perceived risk construct. Several other works had been done using perceived risk to support the explanatory power of TAM in examining consumers' behaviour in B2C e-commerce; such include Tzy-Wen et al. (2005), Li et al. (2009), and Belkhamza et al. (2009). Building on previous views on the argumentative power of TAM, an extended TAM shown in figure 1 is adopted as the model for this study.

RESEARCH MODEL AND HYPOTHESES

Considering the goal of TTF to match users' task needs and the available functionality of the IT, the study proposed the following hypothesis:

H_1: Task-technology fit is positively related to perceived usefulness.
H_2: Task-technology fit is positively related to perceived ease of use.
H_3: Task-technology fit is positively related to intention to use e-commerce.

It is expected that perceived usefulness will influence intention to use and the actual use of online shopping activities. Perceived ease of use will influence intention to use and intention to use will influence actual use of online shopping activities. As Davis (1989) showed, beliefs about perceived usefulness and perceived ease of use influence the actual outcomes. Therefore, the following hypotheses are proposed:

H_4: Perceived usefulness is positively related to the intention to use online shopping.
H_5: Perceived ease of use is positively related to the intention to use online shopping.

According to Jarvenpaa et al. (2000), perceived risk or loss would negatively influence perceived usefulness toward online shopping. Several other research works also validated the fact that perceived risk negatively influenced

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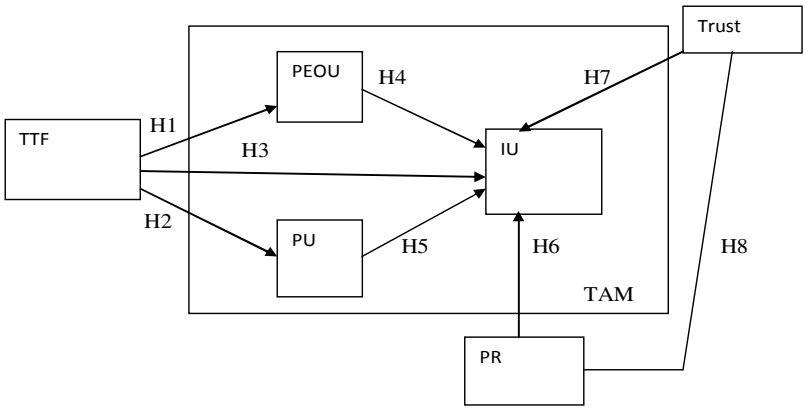

Figure 1. Research model and hypothesis.

influenced consumers' perceived usefulness or perceived ease of use to purchase on the Internet. Perceived risk is widely accepted as previous measure of perceived usefulness and perceived ease of use before purchasing products or services, based on the buying goals of the consumers. To further on previous researches, the studies seek to examine the direct effect of perceived risk on behavioral intention. Furthermore, e-commerce is a new and growing phenomenon in Nigeria. It is important to know the impact of perceived risk on consumers in the system. Therefore, the study proposed the following hypothesis:

H_6: Perceived risk negatively influence intention to use e-commerce

Thus trust reduces the perceived risk and can also help consumers' intention to transact. When a Web retailer can be trusted to show competence, integrity, and benevolence, there is much less risk involved in interacting with it. Consumers also assume that a trusted Web retailer will not engage in opportunistic behaviours (Pavlou 2003; Ba and Pavlou, 2002). A lot of previous researches have validated the relationship between trust, perceived usefulness, and perceived ease of use. There is however the need to examine the direct impact of trust on intention to use e-commerce, thus the following hypothesis:

H_7: Consumer trust is positively related to intention to use e-commerce

H_8: Perceived risk is negatively related to trust in e-commerce.

METHODOLOGY

The survey research method is used in this study. Data was collected based on the concepts defined in the research model and hypothesis tested.

The empirical study employs a questionnaire designed to collect data for testing the reliability and validity of the model and research hypotheses. The questionnaire was divided into two sections. The first section consists of demographic profile, internet usage, and online shopping activities of the respondent. The second section of the questionnaire includes measures of variables to be studied, including perceived usefulness, perceived ease of use, behavioral intention, actual purchase behaviour, perceived risk and task-technology fit. The section consist of 20 questions; 3 questions on perceived ease of use, 3 questions on perceived usefulness, 3 questions on perceived risk, 3 technology trust, 4 questions on task-technology fit, and 3 questions on intention to use. The scales used to measure perceived usefulness, perceived ease of use, intention to use, actual use, and task-technology fit were adapted from prior studies (Davis et al 1989., Klopping and McKinney (2004), and Goodhue et al., 1995) which established their reliability and validity. Measurement scale for trust dimension was adapted from Tzy-wen et al. (2005), Gefen et al (2003), and Pavlou (2003). The items of perceived risk construct were adapted from the work of Belkhamza et al. (2009), Li et al. (2009), and Pavlou (2003). For all model constructs, the participants were asked to indicate their perception on five-point Likert-style responses ranged from 1 = "strongly disagree," through 3 = "neutral," to 5 = "strongly agree".
The questionnaires were randomly distributed within the research population: Oyo State and Lagos State of Nigeria without prejudices to prior knowledge of B2C adoption. The choice of the two states is based on the fact that Ibadan which is the Capital of Oyo State is the largest city in Africa with a large number of business outfits while Lagos State was the former capital of Nigeria and has remained the commercial nerve centre of the country. Lagos State houses the largest concentration of financial institutions in the country. There were 900 questionnaires randomly administered within four months, 635 were received, and 90 of them were incomplete. The remaining 549 valid and complete questionnaires were used for the quantitative analysis. It represented a useable response rate of 60.5%. The data collected was analyzed using the statistical package for social sciences (SPSS) version 15.0. The reliability of data collected was validated using Cronbach's alpha. The data was also analyzed based on statistical description, correlation and model fit to test the hypothesis.

RESULTS AND ANALYSES

Demographic profile, Internet usage and online shopping behaviour

From Table 1, 38.3% of the respondents were female while 61.7% were male. 88.6% of the respondents were of ages between 20 to 50 years. 74.7% hold a B.Sc. degree

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Table 1. Demographic profile.

Variable	Frequency	Percent
Gender		
Female	210	38.3
male	339	61.7
Total	549	100
Occupation		
Civil service	71	12.9
Trading	124	22.6
Education	137	25
Manufacturing	63	11.5
IT	26	4.7
Others	128	23.3
Total	549	100
Age		
<20	14	2.6
21 - 30	93	16.9
31 - 40	206	37.5
41 - 50	188	34.2
51 - 60	40	7.3
60+	8	1.6
Total	549	100
Education		
Primary	47	8.6
High school	31	5.6
B.Sc/HND	248	45.2
Post-graduate	162	29.5
Others	61	11.1
Total	549	100
Monthly Income		
50,000	146	26.6
50,000 - 100,000	213	38.6
100,000-150,000	118	21.5
>150,000	70	13.3
Total	549	100

degree or higher diploma degree (HND). This shows that above 70 percent of the sampling population are learned and could be potential users of B2C e-commerce. The monthly income of 60.7% of the respondents fell between N50, 000 and N150, 000 ($1 = N150). From table 2, the Internet usage of respondents showed that 51.4% had fair access to Internet, 27.9% access very often and 20.7% always had access to the Internet. Public Café carries 22.6% of internet sources of the respondents, 33.0% had private means of connecting the internet and 44.4% accessed the internet while in the office. ATM is the dominant payment instrument among respondent representing 56.3% of the respondents, 29.5% possessed VISA Card, 7.7% has Master card, and 6.6% possessed all the three e-payment instruments.

Online shopping behaviour of respondents indicated that only 23.3% had ever procured goods online. 37.0% of the respondents had never visited any online shop. 18.0% had visited 1 to 2 online shops, 24.6% had visited 3 to 5 online shops, 12.6% had visited between 6 to 20 online shops, and 7.8% indicated to have visited above 20 online shops. Internal consistency was measured by applying the Cronbach's alpha test to the individual scales. As all of the items had an alpha above the standard

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Table 2. Internet usage.

Variable	Frequency	Percentage
Frequency of internet access		
Fairly often	282	51.3
Very often	153	27.9
Always	114	20.8
Total	549	100
Payment instrument		
ATM	309	56.3
VISA card	162	29.5
Master card	42	7.7
All	36	6.6
Total	549	100
Source of internet access		
Personal	181	33
Official	244	44.4
Public cafe	118	21.6
Total	549	100
Ever procured goods online		
Yes	128	23.3
No	421	76.7
Total	549	100
Online shops visited in a month		
None	203	37
1-2	99	18
3-5	135	24.6
6-20	69	12.6
Over 20	43	7.8
Total	549	100
Using internet for shopping activities		
Once a year	81	14.8
Two or three times a year	90	16.4
Monthly	152	27.7
Daily	54	9.8
not at all	172	31.3
Total	549	100

standard guideline of 0.70, the scales can be used for analysis with acceptable reliability.

Correlation and hypothesis testing

The correlation analysis was carried out to examine the relationship between the constructs. Descriptive statistics and the correlation matrix for the study's principal constructs are shown in Table 3. The results of the correlation analysis showed that there is no significant correlation between task-technology fit and perceived usefulness. Perceived risk also has a negative insignificant relationship with perceived usefulness. Otherwise, there is positive significant correlation among all the items in the model. Task-technology fit and perceived usefulness have the highest correlation coefficient of 0.2623 and 0.2002 with intentions to use at 1% significant level.

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Table 3. Descriptive statistics and correlation analysis.

	PU	PEOU	Trust	PR	TTF	IU	Mean	Std. Dev	N
PU	1.0000						3.0182	0.8864	
PEOU	0.1531* (0.0003)	1.0000					2.8589	0.7627	
trust	0.1245* (0.0035)	0.1710* (0.0001)	1.0000				3.0006	0.8161	
PR	-0.0077 (0.8581)	0.1208* (0.0046)	0.1679* (0.0001)	1.0000			2.8494	0.7877	549
TTF	0.1163* (0.0064)	0.0749*** (0.0797)	0.0727*** (0.0895)	0.2100* (0.0000)	1.0000		3.8270	0.9724	
IU	0.2002* (0.0000)	0.0993* (0.0201)	0.0776*** (0.0691)	0.0349 (0.4139)	0.2623* (0.0000)	1.0000	2.9302	0.8549	

*, **, *** are indication of level of significance which represents 1, 5, and 10% respectively.

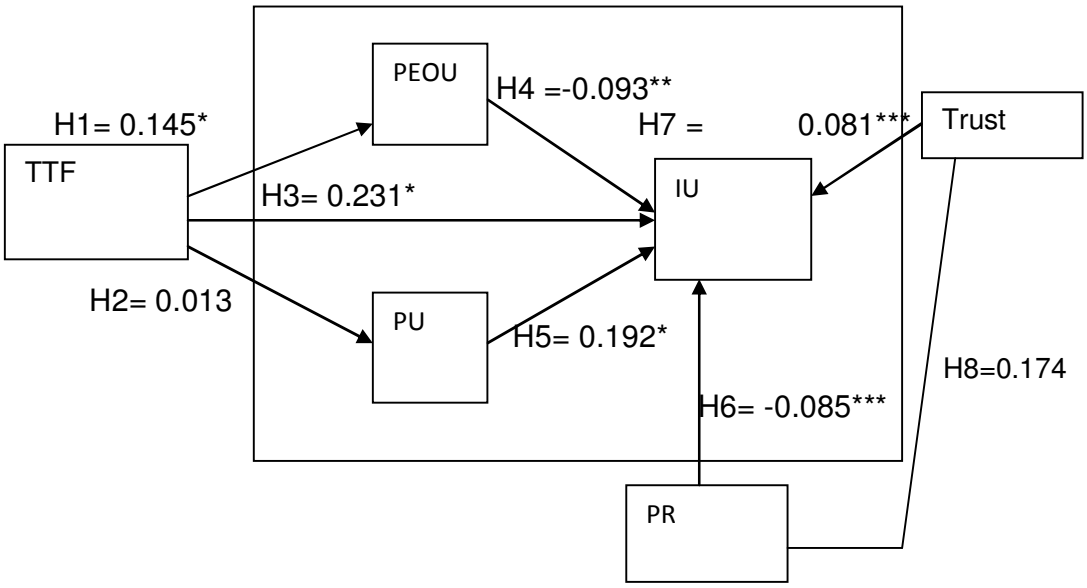

Figure 2. Path coefficient of the model. *p < 0.01, **p < 0.05, and ***p < 0.10.

Hypothesis testing

To test the hypothesis, path analysis using model fit was used to measure the influence of explanatory variables along each separate path. This is appropriate for finding the degree to which variation of a given effect is determined by a particular cause. Path analysis is a multivariate analytical methodology for empirically examining sets of relationships in the form of linear causal models (Duncan, 1986; Li, 1975). As shown in the reserach research model (Figure 2), unidirectional arrows linking two variables together represent the hypothetical causal relationships. Path analysis was proven to be consistent with the methodology used by others in similar studies (Dishaw and Strong, 1999; Lee et al., 2001; Klopping et al., 2004).

The empirical result as shown in Figure 2 indicates the model fit the data. The overall model fit shows that a combination of the entire model constructs (R^2 = 0.129, Adj. R^2 = 0.121, df = 5, α = 1.754, F = 15.987, P-value

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Table 4. Path coefficients and hypothesis testing.

Hypothesis	Relationship	Coefficient	P-value	Supported
H_1	TTF -> PEOU	0.059	0.000	Yes
H_2	TTF -> PU	0.145	0.007	Yes
H_3	TTF -> IU	0.231	0.000	Yes
H_4	PEOU -> IU	-0.093	0.10	No
H_5	PU -> IU	0.192	0.000	Yes
H_6	PR -> IU	-0.085	0.060	Yes
H_7	Trust -> IU	0.081	0.070	Yes
H_8	PR - >Trust	0.174	0.000	yes

value = 0.000) has significant effect on consumers' intention to use online shopping. However the individual path analysis shows that not all the principal constructs in the model have significant effect on intention to use. The path coefficient of PEOU to IU ($b = -0.093$, $p < 0.10$) indicates that perceived ease of use has negative significant effect on behavioral intentions. The path coefficient of TTF to PEOU (H_1), Trust to IU (H_7), and PU to IU (H_5) are significant at the 0.10 SL. The path coefficient of PR to IU is significant at 0.05 significant. The path TTF to IU is significant at 0.01 SL. The path coefficients and overall model fix indices of the research model are drawn as shown in Figure 2.

DISCUSSION

The aim of this study is to investigate issues in consumers' adoption of B2C e-commerce and advance its implementation in Nigeria. The study made no choice of a particular set of population besides citizens who are computer literate and familiar with the use of the Internet. Having observed that the major use of the Internet among Nigerian populace is for email and social networking, this study empirical investigates B2C e-commerce system usage using a combination of information system adoption models. An extended Technology Acceptance Model (TAM) with task-technology fit, perceived risk and trust was developed and tested using linear regression. The results show there are significant relationships between the model variables.

Following TAM, the results also supported the proposed positive relationship between perceived usefulness and intention to transact. However, perceived ease of use contrary to previous findings shows negative effect on intention to transact. Findings in Gefen and Straub (2000) and Lui and Jameison can justify this observation. The study of Lui and Jameison reported negative coefficient with no significant effect. They concluded that perceived ease of use has no effect on intentions to transact because system ease of use is not an inherent quality of the purchased product. This variation could possibly be due to different domain and early adoption of the technology technology adoption in the country.

The interrelationship among trust, perceived risk, and behavioral intention are significant. The effect of risk on trust was statistically showing that risk is a predictor of trust. Risk has a high significant on trust and trust in turn has low significant effect on behavioral intention (Table 4). To advance on previous works, this study examine direct impact of perceived risk on intentions to use and found perceived risk negatively influence intention to use.

Adding TTF and its relationships to the TAM also fit the data. The relationship between task-technology fit, perceived ease of use, perceived usefulness and intention are significant. This further support the argument of Klopping et al. (2004) that consumer perceptions of usefulness are more dependent on technology fit to the task at hand rather than in the workplace environment where perceptions of usefulness may be more influenced by work factors such as reward and social norms.

Major challenges identified by respondents as impedement to B2C e-commerce acceptance include high tendency of internet fraud, reliability of payment instrument, insufficient information on the e-commerce site, and cost of accessing the internet especially those who use public café.

In conclusion, this study suggests that use of the Internet for B2C e-commerce depends on usefulness, task fit, and trust. Web retailer must put up web sites that are rich enough for consumers to be certain of making right choices. Also adequate information must always be provided. Online vendors need to take perceived risk into account in their website planning efforts and improve on increasing consumers trust. To diminish perceived risk, adequate information must be made available on the web site. Adaptive Web site approach can also be adopted to improve consumers' sense of privacy.

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