

COMMON CAUSES OF TRUST, SATISFACTION AND TAM IN ONLINE SHOPPING: AN INTEGRATED MODEL

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Summary

Trust and satisfaction are two stepping stones for success of online business. But the relationship between these two important concepts is still clouded in confusion. This study proposes common causes between trust and satisfaction. Trust and satisfaction are studied in a whole integrated model with technology acceptance model (TAM). How Information quality, system quality and service quality affecting intention of online customer are also explained in our framework. We deliver questionnaire through email survey. Most of the respondents are students from Vietnam and Taiwan. Book e-shopping is the object we select in this study. The result shows that trust and satisfaction affect the e-shopping behavior significantly.

Keywords

Trust, satisfaction, TAM, service quality, information quality

1. INTRODUCTION

Number online subscriber is increasing. Base on World Stats information, number of online user has reached more than two billion. Revenue of online market companies are also increasing. For example Google Inc. their revenue in 2010 is 29,321 million, increases 24% per year. Online market is a big trend. Based on U.S. Census Bureau, total e-commerce trade reaches more 140 billion in 2008. Many online customers just surf online web, but they don't buy. "According to the investigation of CNNIC in 2004, 90.3 percent of online consumers in China are willing to continue their online shopping behavior in the future" (CNNIC, 2004, reported by Yaping Chang). That is very importance for site manager making their surfing customer have intention to buy. Trust and Satisfaction are two stepping stones for successful E-commerce relationships (Dan J. Kim 2009). Both Trust and Satisfaction positively influence Intention to purchase. Intention construct is mentioned in TAM. TAM presents for Technology Acceptance Model. "A Web site is, in essence, an information technology. As such, online purchase intentions should be explained in part by the technology acceptance model, TAM (Davis 1989; Davis et al. 1989). This model is at present a preeminent theory of technology acceptance in IS research. Numerous empirical tests have shown that TAM is a parsimonious and robust model of technology acceptance behaviors in a wide variety of IT" (David Gefen, et all 2003). Tzy-Wen Tang (2005) integrated Trust into TAM. But no person has integrated satisfaction into TAM in online shopping scenario. Relationship of Trust and Satisfy is unclear. Sonia San Martin (2011) said that the influence of satisfaction on trust will remains constant regardless of other factor. Opposite with Sonia, Dan said relationship Trust-> Satisfaction is significant statistical tested. We think that these two constructs are not 'causes' each other. There are common causes which both affects to Trust and Satisfaction simultaneously. This is consistent with Sung-Joon Yoon study. Sung-Joon proposed four antecedents, but we proposed more factors. Our factors also include three of Sung-Joon

factors. E-service quality has been discussed in literature, but none of them test the quality e-service with satisfy, trust, and intention. All papers which discussed about trust, satisfaction, TAM and intention are neglected. We combined different strands in one integrated framework.

Table 1 Relationship

sources		Website Quality	Trust	Satisfaction	TAM	Intention	Trust affects Intention	Satisfaction affects Intention	Trust affects Satisfaction	Satisfaction affects Trust	Correlation between Trust and Satisfaction
2009	Dan J. Kim, Donal L. Ferrin, H. Raghav Rao	hx	x	x		x	x	x	x		
2010	Matti Mantymaki, Jari salo	hx	x			x	x				
2005	Tzy-wen Tang, Wen-hai Chi		x		x	x	x				
2006	Andreas I. Nicolaou, D. Harrison McKnight	hx	x			x	x				
2011	Adam Finn	hx		x							
2003	David Gefen, Elena Karahanna, Ketmar W. Straub		x		x	x	x				
2010	Christy M K Cheung, Matthew K O Lee	hx		x							
2006	Ling-Lanh Tang, Yu-Bin Chiu, Wei-Chen Tsai	hx				x					
2006	Nancy Lankton, D. Harrison MCKnight		x	x		x	x	x			
2002	Sung-Joon Yoon	hx	x	x		x	x	x			x
2009	Glen L. Urban, Cinda Amyz, Antonio Lorenzon		x			x	x				
2001	Paul Pavlou		x		x	x	x				
2011	Sonia San Martin, Carmen Camarero and Rebeca San Jose	hx	x	x						x	
2005	Juhani Iivari			x							
2008	Sangeeta Sahney	x									
2005	A. Parasuram, Valarie A. Zeithaml, Arvind Malhotra	x									
2005	Yu-Bin Chiu, Chieh-Peng Lin, Ling-Lang Tang				x	x					
2002	Paul Pavlou, David Gefen		x	x		x	x	x	x		

hx: partly of construct have discussed. x: full dimension of construct have discussed.

This paper makes three contributions to literature. First, we integrated Satisfaction and TAM modification in online shopping context. Second, we explained correlation between Trust and Satisfaction by e-service quality. Third, we empirical tested e-services quality, trust, satisfaction, and intention.

2. HYPOTHESIS AND FRAMEWORK

Figure 1 shows research model. In this model, TAM was omitted behavior part. Measurements of Perceive ease of Use, Perceive usefulness, Intention to Use are different with those measurement in Fred D. David (2000). TAM is applicable model in many minor technology fields. TAM in that research rather measure technical than online context. We measure each constructs by one question only. In our model, Perceive usefulness (PU) and Perceive Ease to use (PEU) doesn't directly effect to Intentions to buy. PU and PEU both influence to attitude (in our model are Trust and Satisfaction). This finding is consistent with Taylor and Todd (1995). PU belongs to Information quality, PEU belongs to System quality.

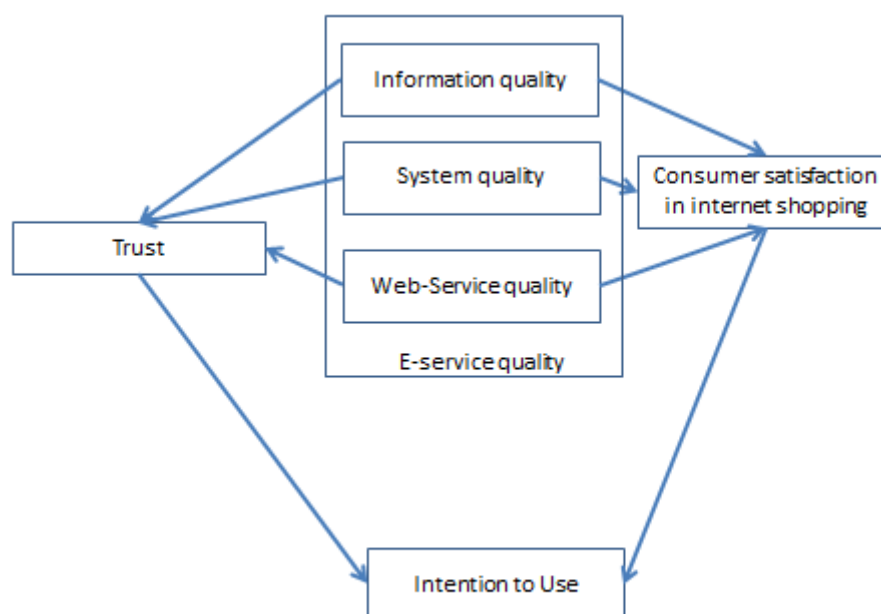
2.1 Hypothesis development

Information quality and System quality have been proved positively influencing user satisfaction (Stacie Petter, DeLone and McLean 2006, Felix B Tan 2011, Christy M. K Cheung and Matthew K O Lee 2010). Different authors have different ways of measuring

information quality. Christy M K Cheung study information quality by four aspects: accuracy, content, format, timeliness. Saneeta Sahney (2008) mentions about extensive product information. Juhani Livari (2005) used currency, completeness, consistency. Personalization and Relevance Security are mentioned in DeLone and McLean in 2003.

Hypothesis 1: information quality positively influences satisfaction.

Figure 1 Research Framework



Variety of scales have been used to measure system quality: flexibility, integration, response time, recover ability, convenience, language (Juhani livari), Ease of use, ease of learning, system features, sophistication, integration, customization (Sedera et al., 2004)

Hypothesis 2: System quality of website positively influences Satisfaction.

Christy M K Cheung reviewed literature, and make proposition that service quality of online shopping significant effect on Consumer satisfaction. Literature are based on studies of Devaraj et al. 2002, Turban and Gehrke 2000, Jarvenpass and Todd 1997, Zeithaml et al. 2002, Watson et al. 1998.

Hypothesis 3: Web-service quality positively influences Satisfaction

In the empirical research of Khaled S. Hassanein and Milena M. Head (2004), Social presence (Matti Mantymaki and Jari Salo 2010,) perceived usefulness (belong to information quality), perceived ease of use (belongs to system quality) positively impact on Trust (Tzy-Wen Tang, Wen-Hai Chi 2005, David Gegen et al. 2003,). Information quality positively influences Trust in the inter-organizational context (Nicolaou and McKnight 2006).

Hypothesis 4: System quality positively influences Trust

Hypothesis 5: Information quality positively influences Trust

Social presence shows positive effect to Trust (Khaled S. Hassanein and Milena M. Head 2004, 2007, Matti Mantymaki, Jari salo 2010). Assurance also effects to Trust (D. Harrison McKnight, Vivek Choudhury 2006). Web-service quality includes Social presence, assurance

and other factors which haven't been tested (effect with trust).

Hypothesis 6: Web-service quality positively influences Trust

Satisfaction positively influences to e-loyalty (Dan J. Kim, et al. 2009). E-loyalty was measured by intention to buy. Saying other words, Satisfaction positively influences intention to use (Sergio Roman 2010, Nancy Lankton, D. Harrison MCKnight 2006, Sung-Joon Yoon 2002, Paul Pavlou, David Gefen 2002, Stacie Petter, William DeLone, Ephraim McLean 2006, William H. DeLone and Ephraim R. McLean 2003). Dan J. Kim (2009) didn't mention about Trust influences Intention or not. Tonita Perea y Monsuwe, Benedict G.C. Dellaert and Ko de Ruyter (2004) proposed that Trust doesn't directly influence to Intention. Relationship between Trust and Intention has long been study in variety studies (Matti Mantymaki, Jari salo 2010, Khaled S. Hassanein, Milena M. Head 2005, Andreas I. Nicolaou, D. Harrison McKnight 2006, Tzy-wen Tang, Wen-hai Chi 2005, Khaled S. Hassanein, Milena M. Head 2007, D. Harrison McKnight, Vivek Choudhury 2000, 2006, David Gefen, Elena Karahanna, Ketmar W. Straub 2003, Tonita Perea y Monsuwe, Benedict G.C. Dellaert and Ko de Ruyter 2004, Nancy Lankton, D. Harrison MCKnight 2006, Sung-Joon Yoon 2002, Glen L. Urban, Cinda Amyz, Antonio Lorenzon 2009, Felix B Tan 2011, Paul Pavlou, David Gefen 2002).

Hypothesis 7: Trust positively influences Intention to Use

Hypothesis 8: Satisfaction positively influences Intention to Use.

3. METHOD

3.1 Subjects

In this study, data is obtained from a student or younger from author list friend in Facebook, other are delivered through hand in four classes in Yuan Ze University. Totally 625 questionnaires are sent by mail or personal messages. Online informants are young and live all over the world. Most of them are students. We received 180 online responses, and 70 hand in responses. There are 11 incomplete questionnaires and 7 uncorrected answers (all answers are 4 or 7). Incomplete questionnaires and uncorrected answers are excluded from cases. Finally we have 222 cases for analysis. We first mail questionnaire to thirty graduate students for pilot tested. The questionnaires are edited and given more explanations for easy to understand. Each questionnaire includes 43 items.

3.2 Measures

All the constructs in this study are measured using seven-point Likert scales which modified from the existing literature (or just utilized the existing scales).

System quality includes: Flexibility (personalization: Adam Finn 2011 using semantic differential rating scale), Security (five-point Likert scales by A. Finn 2011), Integration, response time, recoverability, convenience (Juhani Ivari 2005 using semantic differential, we changed into seven-point Likert scales, we remove item language from original of Juhani Ivari scales).

Information quality includes: completeness, precision, consistency, format, currency (update). These items were discussed in Juhani Ivari 2005. We remove item accuracy. We think that have same meaning with Precision. We also changed semantic difference meaning into seven-point Likert scales.

Web-service quality includes: customer support (A. Finn 2011, semantic differential rating scale, five-point Likert scales, we changed into seven-point Likert scales), returnability (A. Finn 2011, semantic different meaning was changed into seven-point Likert scale), social presence (Gefen and Straub 2004, we reduce number of question into three questions),

assurance (A. Finn 2011, semantic differential rating scales were changed into seven-point Likert scales).

We utilize measurement of A. Finn (2011) to measure Satisfaction. We changed five-point scales into seven-point scales. Measurements of Intention to use and Trust are taken from Dan J. Kim (2009).

3.3 Measurement model

We use SPSS and AMOS 18 for analysis. We first tested reliability using SPSS and then using AMOS for further analysis. Total Cronbach's Alpha of whole model is .968.

Table 2 Reliability test

				Item-total correlation	Alpha if item deleted	Cronbach's α	
System quality						.863	
System quality	Flexibility					.727	
	Flexibility (Personalization)	t1	Ability to customize your use of the site	.548	.647		
		T1	Designed to make future transactions easier	.408	.647		
		T3	Site adaptation to your future needs	.330	.677		
		T4	Degree of personalization that is available	.305	.691		
	Integration	T5	Please assess the ability of the website functions to coordinate with each other	.578	.782		
	Response time (speed)	T6	Please assess the response and turnaround time of the website	.639	.754		
	Recoverability	T7	Please assess the ability of the website to recover from errors	.601	.773		
	Convenience (easy to use)	T8	Please assess the easy to use of the website	.690	.730		
	security						.664
							.757
	Security	T9	Information security is a concern at this site	.517	.545		
			.405	.887			
T10		I'm scared to give this site personal information	.208	.757			
T11		I trust this site to respect personal information	.520	.551			
			.688	.563			
	T12	I trust this site to protect visitor's privacy	.591	.501			
			.704	.541			
Information quality						.876	
information quality	Completeness	T13	Please assess the completeness of the information from website?	.567	.883		
	Precision	T14	Please assess the precision of the information providing by website	.758	.836		
	Consistency	T15	Please assess the consistency of the information from website?	.749	.839		
	format	T16	Please assess the format of information from website?	.725	.845		
	Currency (update)	T17	Please assess the currency of the website's information?	.739	.841		
Web-service quality						.915	
Web-service quality	Customer support					.770	
	Customer support	T18	Access to feedback from other consumers	.459	.780		
		T19	Help available to find what you want	.512	.746		
		T20	This site provides me with tailored information	.688	.659		
		T21	I can use this site to get tailored information	.655	.670		
Returnability						.835	

Returnability	T22	Choice of ways to make returns	.691	.778	
	T23	Acceptance of returns without question	.684	.787	
	T24	Reasonableness of their returns policy	.719	.748	
Social presence					.843
Social presence	T25	There is a sense of human contact in Website	.723	.768	
	T26	There is sense of sociability in website	.752	.739	
	T27	There is a sense of human warmth in website	.653	.835	
Assurance					.842
Assurance	T28	Maintaining a well-known business	.693	.792	
	t29	Selling well-known brands	.722	.781	
	T30	Reputation of the website as a brand	.694	.791	
	T31	Market leadership for its type of website	.600	.833	
					.807
Delivery	T32	Delivery time is good	.677		
	T33	My product isn't broken during the delivery process	.677		
Satisfaction					.907
Satisfaction	T34	This website was satisfying to me	.801	.875	
	T35	This website was as good as I expected	.805	.873	
	T36	I feel comfortable surfing this website	.817	.870	
	T37	This website was worth the time I spent on it	.737	.898	
					.853
Intention to Use	T38	I'm likely to purchase the products on this website	.748	.772	
	T39	I'm likely to recommend this website to my friends	.709	.809	
	T40	I'm likely to make another purchase from this website if I need the products that I will buy	.716	.803	
					.877
Trust	T41	This website is trustworthy	.785	.805	
	T42	This website vendor gives the impression that it keeps promises and commitments	.769	.822	
	T43	I believe that this website vendor has my best interests in mind	.736	.850	

Corrected item-total correlation of t10 was too low. We remove t10, and test reliability again. We can see the higher Alpha of items t9, t11, t12. Using EFA in SPSS, we proposed remove item t10 because of low factor loading.

Because this model contains so many scales, we try to test for each individual model. The table below shows the different indexes and criteria for justify a model.

Table 3 Model criteria

Indexes	Criteria	Result				Justify			
		ML1	ML2	ML3	ML4	ML1	ML2	ML3	ML4
$\chi^2/d.f$	<3	2.27	2.274	2.935	*	Y	Y	Y	*
GFI	>0.9	0.93	.892	.839	.813	Y	N	N	N
RMSEA	<0.05 is great	0.074	0.07	.091	.080	Good	Good	Accept	Good
	0.05<RMSEA<0.08 good								
	0.08<RMSEA<0.1: accept								
NFI	>0.9	0.93	.908	.875	.850	Y	Y	N	N
IFI	>0.9	0.959	.949	.914	.904	Y	Y	Y	Y
NNFI;TLI	>0.9	0.949	.935	.897	.889	Y	Y	N	N
CFI	>0.9	0.959	.949	.914	.904	Y	Y	Y	Y
PNFI	>0.05	0.744	.736	.738	.737	Y	Y	Y	Y
PGFI	>0.05	0.767	.770	.770	.783	Y	Y	Y	Y
AVE	>0.5					Y	Y	Y	Y

ML1-4; Model 1-4;

Figure 3 Model of Information quality, satisfaction, intention, and trust: ML1

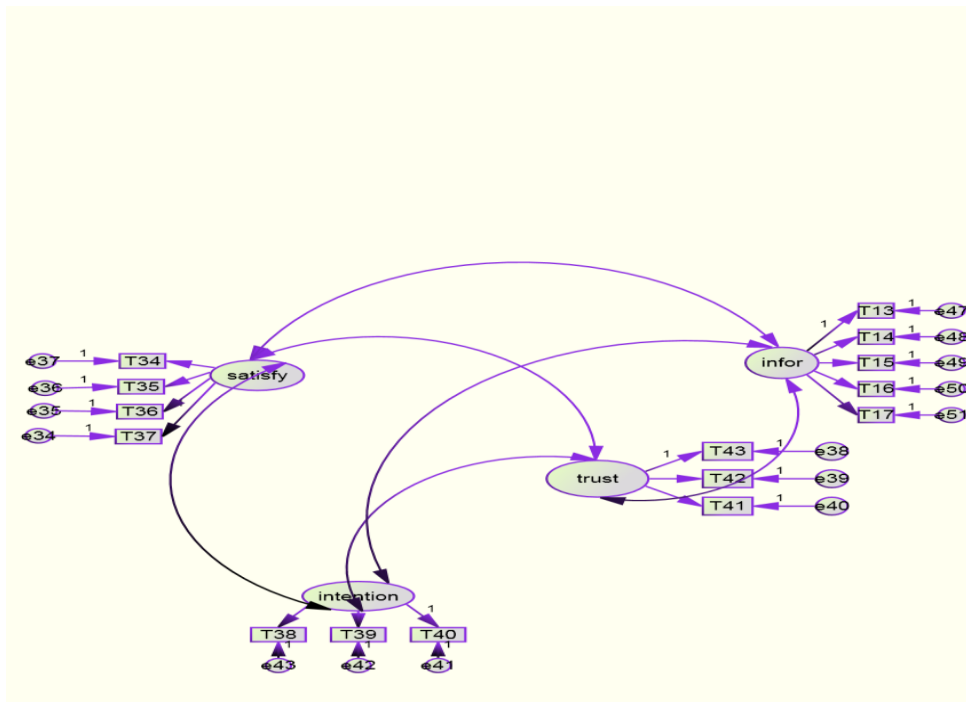


Table 4 Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
trust	<--- infor	.935	.099	9.423	***	par_14
satisfy	<--- infor	.941	.101	9.300	***	par_15
intension	<--- trust	.570	.097	5.907	***	par_12
intension	<--- satisfy	.450	.089	5.033	***	par_13

Figure 4 (ML2) Intention trust system satisfaction

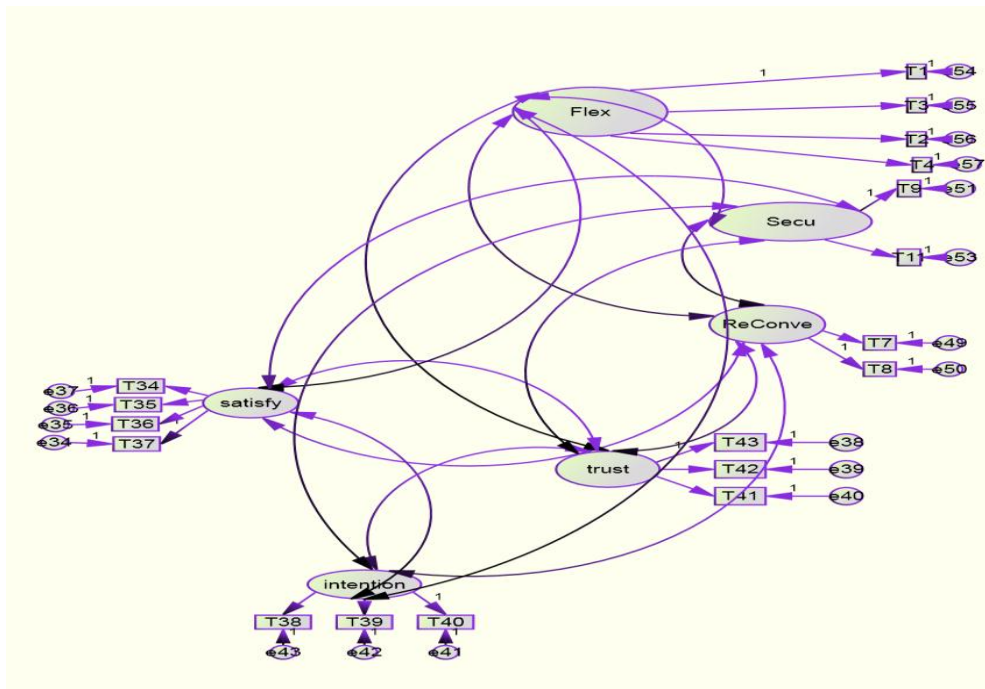


Figure 5 ML3

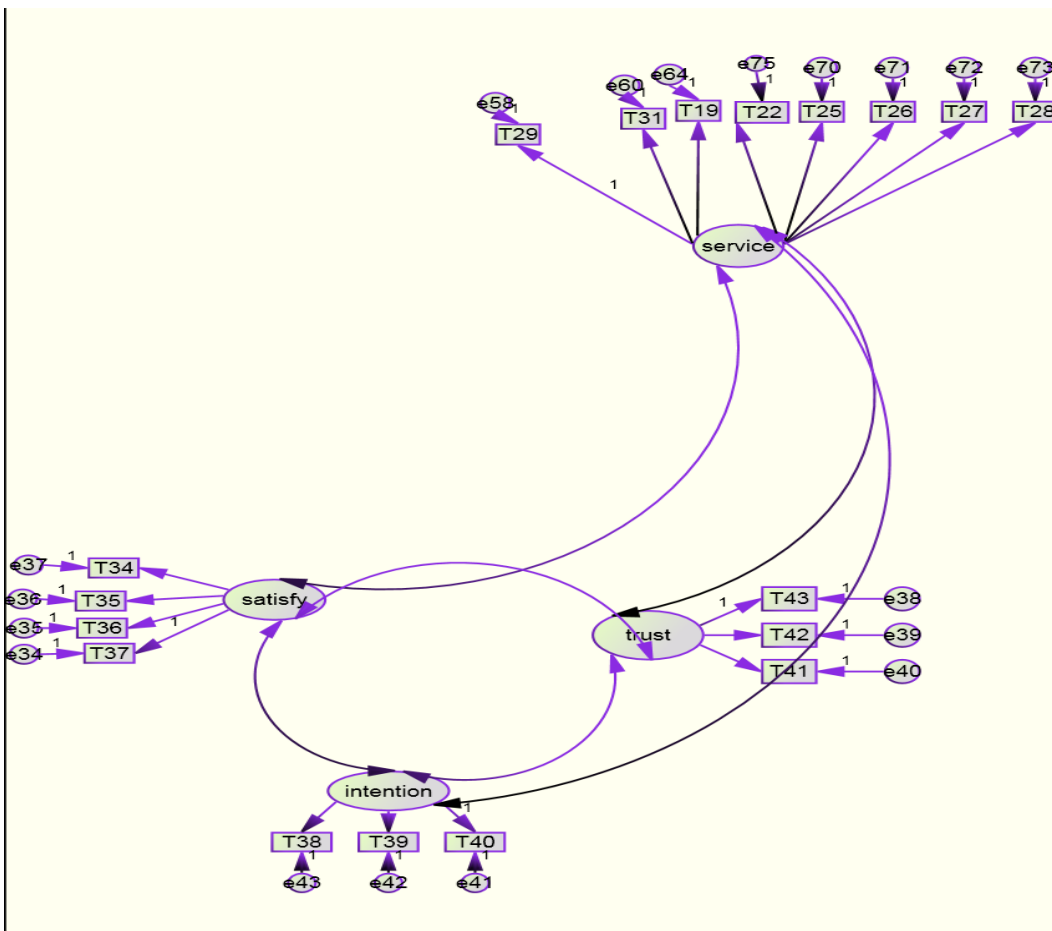
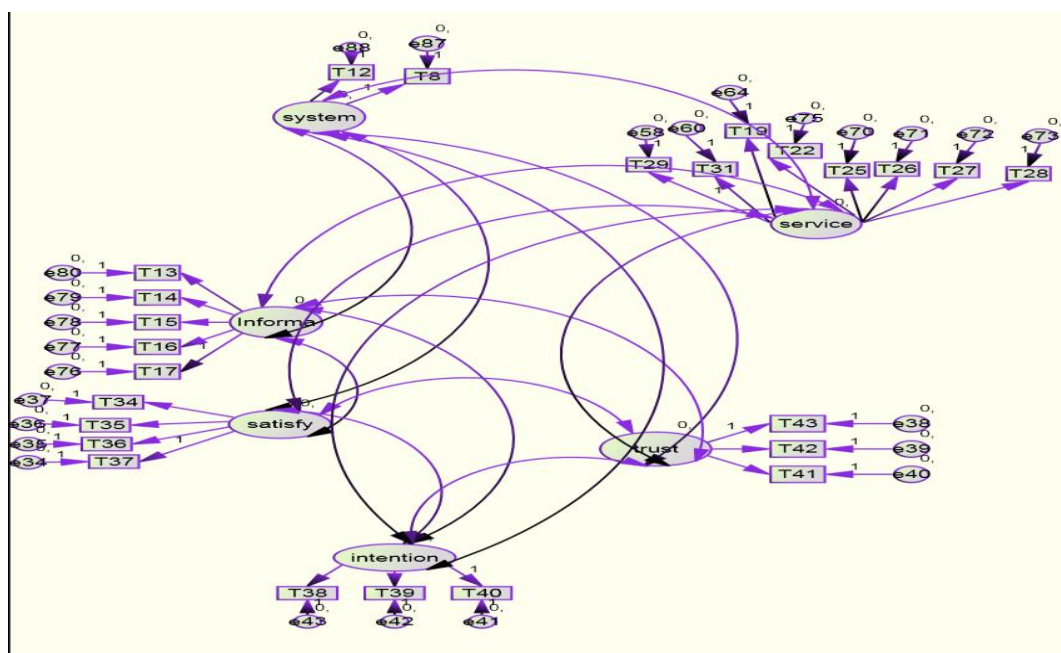


Figure 6 whole model test (ML4)



$$AVE = \frac{\Sigma[\lambda_i^2]Var(X)}{\Sigma[\lambda_i^2]Var(X) + \Sigma[Var(\epsilon_i)]}$$

Table 5 correlation and AVE

	system	Informa	service	intention	trust	satisfy
system	0.869036636					
Informa	.982	0.973932338				
service	.882	.785	0.970303498			
intention	.805	.753	.860	0.964279736		
trust	.919	.772	.881	.899	0.974694963	
satisfy	.880	.744	.856	.873	.882	0.980015727

3.3 data analyses

3.3.1 Reliability test

Total Alpha of all construct is 0.968. That was very high. Our measurement model has reliability. The construct security has four scales (t9-t12). T10 has very low total correlation, and Alpha get much higher if t10 is deleted. Alpha before deleting t10 was 0.664. That was lower than 0.7. But that value is still acceptable. We run EFA in SPSS, result shows that in security has 2 factors. T9, t11, t12 belong to one factor, T10 belong to the second factor. We exclude t10 for further analyses. In Table 2, each scale of Security has two reliability alpha values. The above is value which t10 had not deleted, the below is value which t10 had deleted.

3.3.2 Validity test

With each construct, we run factor analysis in SPSS, all constructs have one factor loading. We also run CFA in AMOS. All measurement scales show high statistical significant and high factor loading.

Table 5 shows correlation and AVE of each constructs. We using excel to calculate AVE of each construct. Before the table is formula of AVE (Fornell and Larker ,1981). All AVE of different measurements are higher than 0.5 which means our measure have convergent validity (Robert Ping, 2005).

AVE of Informa, service, intention, trust, and satisfy are higher than their correlation of different constructs. Which means Informa, service, intention, trust, and satisfy has discriminant validity (Fornell and Larker, 1981). Only System construct did not satisfy discriminant validity criteria.

3.3.3 Hypothesis test

We use path model testing in AMOS to test the goodness of the model. Path of Model 1 (ML1) was used to test H 1, and H5. Table 1 shows very good result. H1 and H5 is statistical significant tested. In this model, all the criteria are satisfied!

In table 1, Path of Model 2 has only value GFI (0.892) is not satisfying the criterion. GFI is so close to 0.9. All other criteria are satisfied. H2 and H4 is statistical significant tested.

In the same table, Path of Model 3 (ML3) was used to test H3 and H6. GFI, TLI, and NFI are close to 0.9. Other values are satisfied. H6 and H3 are tested.

The final model and other ML1-ML3 can also prove the relationship between Trust, Satisfaction and Intention to Use.

4. CONCLUSION AND FUTURE ISSUES

4.1 Conclusions

Youngers are surfing internet every day. Making these people have intention to buy depend many different aspects of research. This study also contributes to literature of online shopping, ecommerce in three respects.

First, the study integrates the concepts of satisfaction into TAM, Trust and e-service quality in context of online shopping. Trust has been integrated into TAM. But no study integrates satisfaction into TAM.

Secondly, we explained the correlation between Trust and Satisfaction by e-service quality. Web service quality hasn't been used (before this study) for explained the relationship between Trust and Satisfaction.

Thirdly, this is the first attempt to empirical and theoretical integrated e-service quality with Trust, Satisfaction, TAM, and Intention. E-service quality had been talked as creating measurement scale, but not in the way of conjunction with other constructs.

4.2 Managerial implications – limitations – future research

We also provide method for managers that improve e-service quality. Information quality is a critical factor of e-service quality. Information is very important factors influence to success of online. E-service quality scales can help managers build and compare their current e-service quality. But fail to prove which factor in e-service quality has more strongly effects to intension.

Limitation: system quality hasn't well developed. Discriminant validity of System quality is low. Utilizing measurement scales of information system into online shopping context

maybe need more modification. E-service quality hasn't well measured.

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