

## **PERCEIVED SECURITY TOWARDS E-BANKING SERVICES: AN EXAMINATION AMONG MALAYSIAN YOUNG CONSUMERS**

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### **ABSTRACT**

Electronic banking (or e-banking) has experienced an exponential growth in Malaysia in the recent years. It transforms the traditional banking services and leads to a huge shift in global marketing practices. Despite its popularity, many consumers still doubt about its efficiency and effectiveness. This paper aims to examine how young consumers, especially the Generation Y, perceive the e-banking security based on their perceived regulatory related issues, protected transaction, adequate mechanism and service quality. The results showed that all independent variables, except adequate mechanism, were significantly related to the perception of e-banking security. The findings provide important insights to both academicians and e-banking practitioners in planning for their e-banking strategy.

**Keywords:** Perceived security, e-banking, service quality, young consumer

### **INTRODUCTION**

The increasing deregulation and globalization, as well as the major stimulus for rationalization, consolidation and an increasing focus on costs (Hernandez & Mazzon, 2007 in Ahasanul, Ismail & Daraz, 2009a) have contributed to the explosive growth of e-banking adoption. E-banking, an alternative to the traditional brick and mortar banks and telephone banking, delivers various banking services such as fund transfer, bill payments, checking and viewing of accounts, mortgage payments, purchase of financial instruments and certificates of deposit to customers (Singhal & Padhmanbhan, 2008 in Chavan, 2013; Asahanul et al., 2009a). While business are transacted automatically through electronic devices (Turban, Lee, King & Chung, 2006; Ozuru, Chikwe & Uduma, 2010 in Chavan, 2013), e-banking is said to lead to a massive shift in marketing practices (Brodie, Winklhofer, Coviello & Johnston, 2007), resulting in high performance and convenience (Gerrald & Cunningham, 2003), slashing of information processing (Turner,

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2001 in Chaven, 2013) and operation costs (Cheng, Lam & Yeung, 2006; Sathye, 1999), as well as competitive advantage over rivals. As a result, more banks are rewarding consumers to use online services and at the same time, penalizing those who use offline services (Herington & Weaven, 2007).

Malaysia has actively developed e-banking services since mid-2000. The usage of online household was 1.9 million in 2005, with 11.1 million internet users, 21.1 thousand, ISDN subscribers and 26.4 PC penetrations per 100 households (Poon, 2007). Malaysian e-banking users have increased to 58.4 thousands in the following year with a 23.6% growth (Munusamy, Annamalah & Chelliah, 2012). Despite its exponential growth, consumers are still skeptical over the security concerns (Sathye, 1999; Cheng et al., 2006) such as security breaches and attacks (Gerrard & Cunningham, 2003). Malaysia for instance, is reported to be the sixth most exposed country to cybercrime (*The Star Online*, 2014, September 23) which leads to approximately RM1 billions of losses annually. Malaysia is also reported to experience an increment of 6.5% in internet misapplications such as international scam and banking frauds from 9986 cases in 2012 to 10, 636 cases in 2013. Consequently, consumers are requesting for more convenience yet safer online services, in which risk perception plays a major role in online technology adoption (Sathye, 1999). Consumers are more willing to use e-banking only when they perceive the risks are low (Sathye, 1999; Cheng et al., 2006) and the services are secured.

Most of the e-banking researchers focus on examining consumer behaviour, innovation and acceptance of new innovations (Gerrard & Cunningham, 2003), relationship marketing (Mukherjee & Nath, 2003) and also on the categorization among adopters versus non-adopters (Laforet & Li, 2005). The consumer research is still lacking of empirical evidence on consumers' perceptions toward the e-banking security. Most importantly, there is insufficient study investigating how the Generation Y (Gen Y) or Millennial or Net Generation who constitutes the world's largest population group (Malka, 2012) think about e-banking. As these young consumers imply huge market implication that heightens their importance, their views are important to the e-banking marketers.

It is a common view that young consumers should be more technology savvy and more willing to spend more time online than older users and consequently, have higher intention to shop online (Joines et al., 2013; Swinyard & Smith, 2003). For instance, a study by Calisir & Gumussoy (2008) indicated that young consumers considered internet banking as efficient for its ease of use and access, consistent with Howcroft, Hamilton & Hewer (2002). Face to face contact is perceived as less importance to these consumers hence making e-banking is a convenience choice. In a Malaysian study conducted by Arunkumar (2008) indicated that young consumers tend to have more favourable attitudes towards internet banking than the older consumers. This result supported Harrison and Rainer's (1992) study on new technology acceptance whereby age plays an important role, linking younger consumers to higher acceptance towards new technology. Their older counterparts are comparatively less adaptive to change (Liao, Shao, Wang & Chen, 2004) and encounter more problems with new technology, which further lead to more

negative attitudes. Nevertheless, perceived security is also important to young consumers. It is hence essential for banks to concentrate on customer value by reducing customer defections (Ahasanul, Kumar, Rahman & Abdul Raquib, 2009). Furthermore, marketing researchers who studies Malaysian Generation Y's online shopping behaviour patterns found both supporting and non-supporting evidence (c.f. Sulaiman, Ng & Mohezar, 2008; Osman, Chan & Bei, 2010; Zuroni & Goh, 2012). Due to these contradictory results, more studies are needed to examine the Malaysian young consumers in relation to their perceived security toward e-banking services which are important in influencing their willingness and intention to use e-banking services.

This paper aims to examine how young consumers, especially the Generation Y, perceived e-banking security based on their perceived regulatory related issues, protected transaction, adequate mechanism and service quality. The paper was first started with the discussion on the existing gaps in the e-banking and security studies, followed by the examination of the e-banking literature as well as the four factors examined. Part three and four covered the methodology and the findings of the results. Finally, the discussion and conclusion were included, followed by the discussions on the limitations and recommendations.

## REVIEW OF THE LITERATURE

The adoption of new technology-based delivery channel is mostly depended on consumers' attitudes towards these channels (Laforet & Li, 2005). Factors such as dissatisfaction towards the current service level due to slow speed, inconvenience, limited choice of delivery channels caused consumers to look for alternative service channels. Previous literature shows that consumers' trust towards the website influenced usage intention, while trust was influenced affectively by transaction security and cognitively by transaction security, and website and company awareness (Pi, Liao & Chen, 2012). Similar results were found among Chinese consumers whereby perceived risk was proven to be the most important factor compared to convenience ease of use and accessibility (Laforet & Li, 2004). E-banking security is hence perceived as the most important factor in using the online financial transaction (Aladwani, 2001; Gerrard & Cunningham, 2003; Rotchanakitumnuai & Speece, 2003). Lower intention to use and to adopt a technology-based delivery channel should follow whenever the security is doubted. Nevertheless, some other researchers argue on the importance of security and safety. For instance, the comparisons between the e-banking users and the non-users showed that security was only important determinant for the non-users prior to the decision to use the online services. Once people progressed into users, other variables such as convenience and ease of use became more prominent. This is because the trust of the system is crucial to the unwillingness to adopt an online service (Rotchanakitumnuai, 2004 in Gerrard & Cunningham, 2003).

Ahasanul et al. (2009a) tested online consumers' perceptions toward electronic transaction and identified factors such as secured transaction, sufficient mechanism, service quality and regulatory framework as important contributors to consumer perceptions on e-banking transaction. In their study, only secured transaction was found to significantly influence the consumers' perception on e-banking, while the rest of the three factors were not. First of all, electronic security is a constant and most important requirement in e-banking facing bankers (McCahon, 1999; Haridas, 2000). It is explained as a "*process used to protect a system's information system, or a risk-management or risk mitigation tool*" (Ahasanul et al., 2009a, p. 1872). High security covers both soft and hard infrastructure that protects customer information from hackers (Glaessne, Kellerman & McNevin, 2002). In particular, the soft infrastructure is made up of policies, processes, protocols and guidelines that protect the system and the data; while hard infrastructure consists of hardware and software needed to protect the system and data from threats. A secured transaction occurs when all information involved are "*originated from the right entity and reaches the intended party without being observed, altered or destroyed during transit and storage*" (Chellappa, 2002 in Ahasanul et al., 2009a, p. 1872). In other words, the more secured the transaction, the more secured consumers would feel towards the e-banking services.

Consumers' perception of security is also developed through "*visible sufficient mechanisms that are carried out through processes of encryption, protection, verification and authentication*" (Chellappa, 2002 in Ahasanul et al., 2009a, p. 1872). The use of encrypted or decrypted data that can only be understood by the sender and receiver to ensure the service security protection (Michel, 2003). Hence it is proposed that consumers should perceive the e-banking as more secured when there are sufficient mechanisms available and made known to their customers. Thirdly, service quality was found to significantly influence satisfaction among e-banking users (Jun & Cai, 2001; Delone & McLean, 2003). Unlike tangible product, service is an abstract and elusive construct that poses definition and measurement obstacles (Jun & Cai, 2001). In fact, service quality of online services was found to be a more significant factor than low price or pioneer advantage (Mahajan, Srinivasan & Wind, 2002). Jun & Cai (2001) identified three main components of internet banking service quality, namely customer service quality, banking service product quality and online system quality in their content analysis. Ten dimensions were further identified as the important determinant for customer service quality, namely reliability, responsiveness, competence, courtesy, credibility, access, communication, understanding of customers, collaboration and continuous improvement. The bank product quality is mainly concerned with the product variety and diverse features. Due to the advancement of the online technology, the consumers today can have unlimited access to various information and enjoy a wider range of financial services. The subtle differentiating quality levels of bank products and their timely introduction to the marketplace is a key driving factor in enhancing customers' satisfaction (Mols, 2000 in Jun & Cai, 2001). Six dimensions were identified to measure online system, namely contents, accuracy, ease of use, timeliness, security and aesthetics.

The final dimension discussed by Ahansanul et al. (2009b) concerns the regulatory framework which details how the legislation provides basic protection, rules and regulation to the e-banking users, as well as the effort in increasing the public awareness on the e-banking regulatory framework. The author strongly suggested the importance of having a proper regularity framework to “*boost consumers’ moral motivation and eliminate or reduce their fear and anguish in using e-banking services,*” (p. 257). Bank Negara Malaysia for instance, issued guidelines in relation to e-banking which includes guidelines on online defense mechanism, monitoring of risk and actual compliance to the standards which could be a combination of “*off-site supervision, based on reports submitted by the banking institutions, as well as on-site examinations by examiners,*” (Goi, 2005).

Hence, four hypotheses were proposed to test the relationships between the four independent variables namely, regulatory related issues, protected transaction, adequate mechanism and service quality on perceived security among young consumers:

- H1: There is a significant relationship between regulatory related issues and perceived security.
- H2: There is a significant relationship between protected transaction and perceived security.
- H3: There is a significant relationship between adequate mechanism and perceived security.
- H4: There is a significant relationship between service quality and perceived security.

## METHODOLOGY

A survey instrument via a self-administered questionnaire using a five-point Likert scale was used in this research. Respondents were conveniently selected via interception at local banks around Kota Kinabalu, Sabah for two weeks in May, 2015. Questions for this study were adopted and adapted from past established research in the area of e-banking (Ahasanul et al., 2009), which had been separately tested in a different environment, which further strengthened its content and criterion-related validity. The two main criteria used for testing goodness of measures are validity and reliability. Validity of a scale refers to the degree to which it measures what it is supposed to measure and reliability indicates stability and consistency in terms of measuring the concepts and providing an assessment on the ‘goodness’ of a measure (Sekaran & Bougie, 2010).

$$PS_i = \alpha + \beta_4 RI_i + \beta_5 PT_i + \beta_6 SQ_i + \beta_7 AM_i + \epsilon_i$$

Where;

BE = the value of the Perceived Security (Dependent variable)

$\alpha$  = Alpha, a constant; equals the value of BE when the value of independent variables equals to zero

$\beta$  = Beta, the coefficient of independent variables which indicates how much bridge employment changes for each one-unit change in the independent variables

RI = the value of Regulatory related Issues (Independent Variable)

PT = the value of Protected Transaction (Independent Variable)

SQ = the value of Service Quality (Independent Variable)

AM = the value of Adequate Mechanism (Independent Variable)

$\epsilon_i$  = the error term; the error in predicting the value of Perceived Security, given the value of all the independent variables

Construct validity testifies to how well the results obtained from the use of the measure fit the theories around which the test is design (Sekaran & Bougie, 2010). The first process of construct validity is to look the respective loadings from Table 1 to assess if there are problems with any particular items. The authors used a cutoff value for loadings at 0.5 as significant (Hair et al., 2010). If any items which has a loading of higher than 0.5 on two or more factors then it is considered as significant cross loadings. In this study, it is observed that all the items measuring the particular construct loaded highly on the construct and loaded lower on the other constructs thus conforming construct validity.

As suggested by Hair et al. (2010), factor loadings, composite reliability and average variance extracted from the study to measure its convergent validity. The loadings for all items exceeded the recommended value of 0.5 (Hair et al., 2010). Composite reliability value (refer to Table 2), which depicts the degree to which the construct indicators indicate the latent, range from 0.721 to 0.892 which exceeded the recommended value of 0.5 (Hair et al., 2010). The average variance extracted (AVE) measures the variance captured by the indicators relative to measurement error, and it should be greater than 0.50 to justify using a construct (Barclay et al., 1995). The average variance extracted, were in the range 0.581 to 0.754.

**Table 1** Factor loadings

	<b>Perceived Security</b>	<b>Regulatory Issues</b>	<b>Protected Transaction</b>	<b>Service Quality</b>	<b>Adequate Mechanism</b>
Increase Confident	<b>0.872</b>				
Important Benefit	<b>0.865</b>				
Basic Protection		<b>0.636</b>			
Framework Awareness		<b>0.743</b>			
Rules Development		<b>0.773</b>			
Integrity			<b>0.857</b>		
Security			<b>0.832</b>		
Scared to Use			<b>0.748</b>		
Operating hours				<b>0.812</b>	
Services				<b>0.901</b>	
Security				<b>0.854</b>	
Secure					<b>0.935</b>
Errors					<b>0.535</b>

Bold values are loadings that are above the recommended value of 0.5

**Table 2** Results of measurement model

<b>Model Construct</b>	<b>Measurement Items</b>	<b>Loading</b>	<b>CR<sup>a</sup></b>	<b>AVE<sup>b</sup></b>
Perceived Security	Increase Confident	0.872	0.860	0.754
	Important Benefit	0.865		
Regulatory Issues	Basic Protection	0.636	0.762	0.518
	Framework Awareness	0.743		
	Rules Development	0.773		
Protected Transaction	Integrity	0.857	0.854	0.662
	Security	0.832		
	Scared to Use	0.748		
Service Quality	Operating hours	0.812	0.892	0.733
	Services	0.901		
	Security	0.854		
Adequate Mechanism	Secure	0.935	0.721	0.581
	Errors	0.535		

<sup>a</sup> Composite Reliability (CR) = (square of the summation of the factor loadings) / {(square of the summation of the factor loadings) + (square of the summation of the error variances)}

<sup>b</sup> Average Variance Extracted (AVE) = (summation of the square of the factor loadings) / {(summation of the square of the factor loadings) + (summation of the error variances)}

The discriminant validity (the degree to items differentiate among constructs or measure distinct concepts) was measured by examining the correlations between the measures of potential overlapping constructs. Items should load more strongly on their own constructs in the model, and the average variance shared between each construct and its measure should be greater than the variance shared between the construct and other constructs (Compeau et al., 1999). As shown in Table 3, the squared correlation for each construct is less than the average variance extracted by the indicators measuring the construct indicating adequate discriminant validity. In total, the measurement model demonstrated adequate convergent validity and discriminant validity.

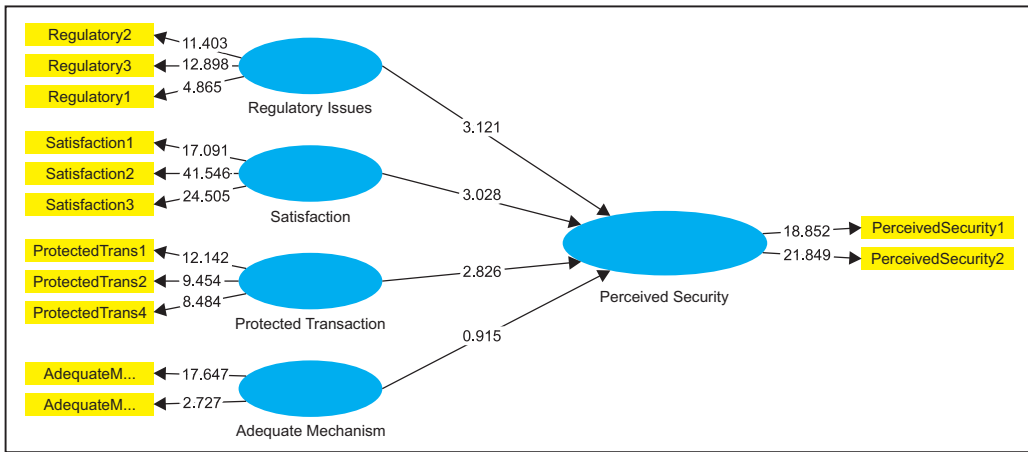


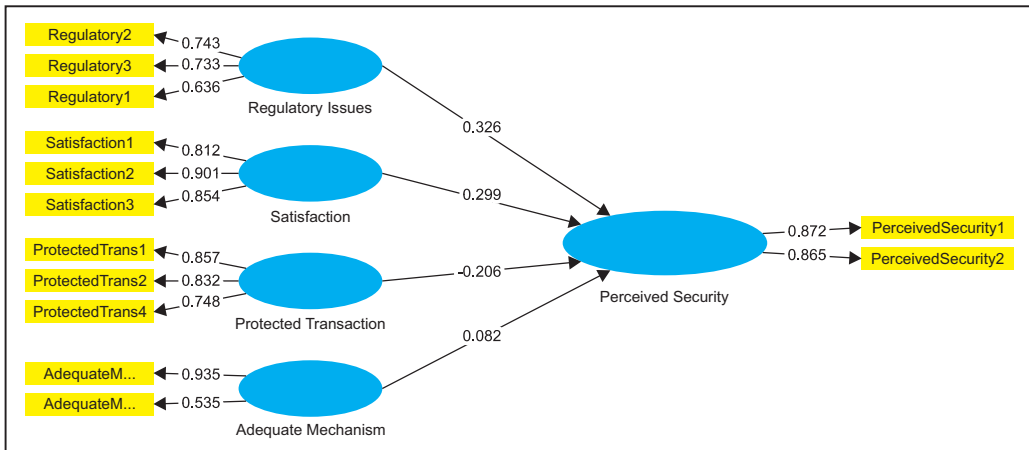
Figure 1 Research model

The structural model represents the relationship between the construct or latent variables that were hypothesized in the research model. The goodness of the theoretical model is established by the variance explained (R<sup>2</sup>) of the endogenous construct and the significance of all path estimates (Chin, 2010). Together the R<sup>2</sup> and the path coefficient indicate how well the data support the hypothesized model (Chin, 1998). Figure 2 and Table 3 shows the results of structural model from Smart PLS output. Regulatory related issues was found to be significantly related to perceived security ( $\beta = 0.326, p < 0.01$ ) and, protected transaction was also found to be significantly associated with perceived security ( $\beta = 0.206, p < 0.05$ ), thus supporting H<sub>1</sub> and H<sub>2</sub> of this study. Similarly, the e-banking service quality also showed a significant association with perceived security ( $\beta = 0.299, p < 0.01$ ), supported H<sub>3</sub>. However, adequate mechanism did not significantly associated with perceived security. Hence, H<sub>4</sub> was not supported. The results showed that regulatory related issue is a stronger predictor to perceived security as compared to protected transaction and e-banking’s service quality.



**Table 3** Summary of the structural model

Path	Hypotheses	Path Coefficient	Standard Error	t-value	Results
Regulatory Issues → Perceived Security	H <sub>1</sub>	0.330	0.104	3.121**	Supported
Protected Transaction → Perceived Security	H <sub>2</sub>	-0.210	0.073	2.826*	Supported
Service Quality → Perceived Security	H <sub>3</sub>	0.297	0.099	3.208**	Supported
Adequate Mechanism → Perceived Security	H <sub>4</sub>	0.091	0.090	0.915	Not Supported



**Figure 2** Structural model

## DISCUSSION AND CONCLUSION

The usage of e-banking around the globe is no longer a sophisticated trend but has emerged into a norm in the developed world, and is also being applied by many banks in developing economies. The main motivation to the enormous usage of e-banking is the numerous benefits it can provide, both to the banks and to customers of financial services. The benefit gained by the financial institutions especially banks is a cost effective way of conducting business and enriching relationship with customers by offering superior services, and innovative products which may be customized to individual needs. Meanwhile, for customers it can provide a variety of choice in terms of the channels they can use to conduct their business, and convenience in terms of when and where they can use e-banking. However, in order for this industry to expand further, what matter most is how consumers perceive the e-banking security which determines their intention to adopt e-banking services.

This study investigates the association of protected transaction, adequate mechanism, service quality and regulatory issues on young consumers' perceived e-banking security in Kota Kinabalu. From the result, it is clearly shown that service quality, regulatory related issues, and protected transaction have significant associations with perceived e-banking security, except adequate mechanism.

First of all, the perceived service quality was found to significantly influence the perceived security among young consumers, consistently with the previous studies (Jun & Cai, 2001; Delone & McLean, 2003; Mahajan et al., 2002). The unlimited access to the e-banking services at their convenient time and location was proven to be important. In this study, service quality was measured based on criteria such as the operation hour, types of services as well as secured environment. In addition, the subtle differentiating quality levels of bank products is also found to influence consumers' perception of e-banking security, consistent with Mols (2000) in Jun and Cai, (2001).

Most importantly, the findings indicated that the regulatory related issues such as the basic protection, rules and regulation detailed in the e-banking regulatory framework were most critical in influencing the level of perceived e-banking security, consistent with Ahasanul et al., (2009b). The results showed that a properly planned regulatory framework can help to boost consumers' moral motivation and reduce their fear and anguish in using e-banking (Ahasanul et al., 2009b). In fact, face to face interaction with customers prior opening an account or extension of credits and more stringent verification procedures (Goi, 2005) also help to heighten perceived security.

Surprisingly, the findings indicated that secured transaction, though significant, had a negative relationship with perceived security, which contradicted the original proposition. In other words, the results showed that the more secured the transaction, the lesser the perceived security. The previous literature explains that the level of consumer confidence on e-banking transaction is depended on both the soft and hard infrastructure in protecting consumer information (Glaessner et al., 2002). These soft and hard infrastructures could be in the forms of policies, processes, protocols, guidelines, as well as the adopted computer hardware and software. Perceived security should be higher whenever consumer information are well protected without being observed, altered or destroyed (Chelappa, 2002 in Ahasanul et al., 2009a). A possible explanation for the negative relationship between secured transaction and perceived security could be consumers' reluctance in engaging into e-banking based on their own perception, especially to those who aren't computer savvy or do not have easy access to the internet, perceived online banking as a daunting task. Even though, bankers have consistently ensured the safety and security of e-banking, consumers with negative perceptions or bad experiences with e-banking will continue not to engage in online banking activities. These consumers prefer physical contact with bankers through the counter transaction as they normally distrust technology and are skeptical of its ability to work properly (Parasuraman, 2000).

Finally, contradicting the previous literature, the adequate mechanism was found not to significantly influence the perceived e-banking security, even though the relationship direction between the independent and dependent variables was found to be in the expected direction. A possible explanation for the insignificant relationship could be due to the single item measurement of the variable which failed to capture the whole picture of the tested construct (Jacoby, 1978; Churchill 1979; Churchill & Peter, 1984). Jacoby argued that “*given the complexity of our subject matter, what makes us think that we can use responses to single items [...] as measures of these concepts, then relate these scores to a host of other variables*” (p. 93). In addition, young consumers are limited by the variety of the service usage which further lead to less understanding on the encryption and decryption processes and the understanding of the tested variable. Most importantly, the small sample size (i.e. 100 respondents) could have led to variations in results. A larger sample approaches the population size and covers all the characteristics of the population should decrease sampling process error and provide more valid results.

E-banking provides many advantages for banks and customer’s. E-banking has made life much easier and banking much faster for both customers and banks. It saves time spent in the banks, it provides banking throughout the year, anytime, anywhere and it provides some security and privacy to consumers by using encryption and secured technologies. This study aims to investigate the association of protected transaction, adequate mechanism, service quality and regulatory issues on young consumers’ perceived e-banking security in Kota Kinabalu. From the result, it is clearly shown that service quality, regulatory related issues, and protected transaction have significant associations with perceived e-banking security, except adequate mechanism. Perhaps further study will be conducted based on a larger sample size and a wider geographical area that will provide an accurate representation of the population.

## REFERENCES

- Ahasanul H., Hj Ismail, A. Z., & Daraz, A. H. (2009a). Issues of e-banking transaction: An empirical investigation on Malaysian customers perception. *Journal of Applied Sciences*, 9 (10), 1870–1879.
- Ahasanul H., Tarofder, A. K., Rahman, S., & Raquib, A. (2009b). Electronic transaction of internet banking and its perception of Malaysian online customers. *African Journal of Business Management*, 3 (6), 248–259.
- Aladwani, A. (2001). Online banking: A field study of drivers, development challenges and expectations. *International Journal of Information Management*, 21 (3), 213–225.
- Arunkumar, S. (2008). A study on attitude and intention towards internet banking with reference to Malaysian consumers in Klang Valley region. *The International Journal of Applied Management and Technology*, 6 (1), 115–146.
- Barclay, D., Thompson, R., & Higgins, C. (1995). The Partial Least Squares (PLS) approach to causal modeling: Personal computer adoption and use an illustration. *Technology Studies* (2:2), 285–309.

- Brodie, R., Winklhofer, J. H., Coviello, N. E., & Johnston, W. J. (2007). Is e-marketing coming of age? An examination of the penetration of e-marketing and firm performance. *Journal of Interactive Marketing*, 21, 2–21.
- Calisir, F., & Gumussoy, A. C. (2008). Internet banking versus other banking channels: Young consumers' view. *International Journal of Information Management*, 28, 215–221.
- Chavan, J. (2013). Internet banking-benefits and challenges in an emerging economy. *International Journal of Research in Business Management (IJRBM)*. 1 (1), 19–26.
- Cheng, T. C. E., Lam, D. Y. C., & Yeung, A. C. L. (2006). Adoption of internet banking: An empirical study in Hong Kong. *Decision Support Systems*, 42 (3), 1558–1572. Retrieved from <http://dx.doi.org/10.1016/j.dss.2006.01.002>.
- Churchill, G. A., Jr. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16 (1), 64–73.
- Churchill, G. A., Jr., & Peter, J. P. (1984). Research design effects on the reliability of rating scales: A meta-analysis. *Journal of Marketing Research*, 21 (4), 360–375.
- Compeau, D. R., Higgins, C. A., & Huff, S. (1999). —Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, 23 (2), 145–158.
- Daniel, E. (1999). Provision of electronic banking in the UK and the Republic of Ireland. *International Journal of Bank Marketing*, 17 (2), 72–82.
- Delone, W. H., & McLean, E. R. (2003). The Delone and Mclean Model of Information Systems success: A ten-year update. *Journal of Management Information Systems*, 19 (4), 9–30.
- Gerrard, J. P., & Cunningham, B. (2003). The diffusion of internet banking among Singapore consumers. *International Journal of Bank Marketing*, 21 (1), 16–28.
- Glaessner, T., Kellermann, T., & McNevin, V. (2002). Electronic security: Risk mitigation in financial transactions. *Public Policy Issues*. The World Bank.
- Goi, C. L. (2005). E-banking in Malaysia: Opportunity and challenges. *Journal of Internet Banking and Commerce*, 10 (3).
- Haridas, R. (2000). Security in e-banking issues. Retrieved from <http://www.expressindia.com/fe/daily/20000410/fe/daily/20000403/fco3052.html>.
- Harrison, A. W., & Rainer, R. K. (1992). The influence of individual differences on skill in end-user computing. *Journal of Management Information Systems*, 9 (1), 93–111.
- Herington, C., & Weaven, S. (2007). Can banks improve customer relationships with high quality online services? *Managing Service Q*, 17, 404–427.
- Howcroft, B., Hamilton, R., & Hewer, P. (2002). Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *International Journal of Bank Marketing*, 20 (3), 111–121.
- Jacoby, J. (1978). Consumer research: A state of the art review. *Journal of Marketing*, 42 (2), 87–96.
- Jun, M. J., & Cai, S. H. (2001). The key determinants of internet banking service quality: A content analysis. *International Journal of Bank Marketing*, 19 (7), 276–291.
- Laforet, S., & Li, X.Y. (2005). Consumers' attitudes towards online and mobile banking in China. *International Journal of Bank Marketing*, 23 (5), 362–380.
- Liao, S., Shao, Y. P., Wang, H., & Chen, A. (1999). The adoption of virtual banking: An empirical study. *International Journal of Information Management*, 19 (1), 63–74.

- Mahajan, V., Srinivasan, R., & Wind, J. (2002). The Dot.Com retail failures of 2000: Were there any winners? *Journal of the Academy of Marketing Science*, 30, 474–486.
- Malka, A. C. G. (2012). Generation Y: A significant generation. Retrieved from upetd.up.ac.za/thesis/available/etd-02192012-234156/.../05chapter5.pdf.
- McCahon, S. (1999, March 2). Banking on it. *Belfast Telegraph*. Retrieved from [http://www.belfasttelegraph.co.uk/business\\_telegraph/business/news.html](http://www.belfasttelegraph.co.uk/business_telegraph/business/news.html).
- Michel, J. S. (2003). Enhance internet banking service quality with quality function deployment approach. *Journal of International Banking and Commerce*, 8 (2), 176–182.
- Mukherjee, A., & Nath, P. (2003). A model of trust in online relationship banking. *International Journal of Bank Management*, 21 (1), 5–15.
- Munusamy, J., Annamalah, S., & Chelliah, S. (2012). A study of users and non-users of internet banking in Malaysia. *International Journal of Innovation, Management and Technology*, 3 (4), 452.
- Osman, S., Chan, B. Y. F., & Bei, H. C. (2010). Undergraduates and online purchasing behavior. *Asian Social Science*, 6 (10). Retrieved from <http://www.ccsenet.org/journal/index.php/ass/article/viewFile/6351/5827>.
- Parasuraman, A. (2000). Technology Readiness Index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2 (4), 307–320.
- Pi, S. M., Liao, H. L., & Chen, H. M. (2012). Factors that affect consumers' trust and continuous adoption of online financial services. *International Journal of Business and Management*, 7 (9), 108–119.
- Poon, W. C. (2007). Users' adoption of e-banking services: The Malaysian perspective. *Journal of Business & Industrial Marketing*, 23 (1), 59–69.
- Rotchanakitumnuai, S., & Speece, M. (2003). Barriers to internet banking adoption: A qualitative study among corporate.
- Sathye, M. (1999). Adoption of internet banking by Australian consumers: An empirical investigation. *International Journal of Bank Management*, 17 (7), 324–334.
- Sulaiman, A., Ng, J., & Mohezar, S. (2008). E-ticketing as a new way of buying tickets: Malaysian perceptions. *Journal of Social Science*, 17 (2), 149–157. Retrieved from [www.researchgate.net/profile/Suhana\\_Mohezar/publication/228634735\\_ETicketing\\_as\\_a\\_new\\_way\\_of\\_buying\\_tickets\\_Malaysian\\_perceptions/file/e0b49519d967484cb8.pdf?origin=publication\\_detail](http://www.researchgate.net/profile/Suhana_Mohezar/publication/228634735_ETicketing_as_a_new_way_of_buying_tickets_Malaysian_perceptions/file/e0b49519d967484cb8.pdf?origin=publication_detail).
- Swinyard, W., and Smith, S. (2003). Why people (don't) shop online: A lifestyle study of the Internet consumer. *Psychology & Marketing*, 20 (7), 567–597
- The Star Online*. (2014, September 23). Malaysia is sixth most vulnerable to cybercrime. Retrieved from <http://www.thestar.com.my/News/Nation/2014/09/23/cyber-crime-malaysians-sixth-most-vulnerable/>.
- Zuroni, J., & Goh, H. L. (2012). Factors influencing consumers' attitude towards e-commerce purchases through online shopping, *International Journal of Humanities and Social Science*, 2 (4), 223–230.

