

Effect of Technological Innovation on the Service Quality Perception of Commercial Banks in Thailand

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ABSTRACT

The purpose of this research is to determine the effects of technological on the service quality perception of commercial banks in Thailand. The population of the study consisted of 424 commercial bank managers. Using the IBM Statistical Package for the Social Sciences (SPSS v.21), the survey were analyzed using multiple regression. The results revealed that the most effective factors on service quality were as follows; social media, ATMs, internet banking (significance level at 0.01). Factor level relationships had described Thailand commercial banks service quality's inconstancy at 75 percentages.

Keywords: Service quality, Technological innovation, Thailand

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Introduction

Readiness for financial and banking institutions reflects government policy achievement through Thai commercial banks and international financial institutions which invested freely in Thailand among the expansion of business at high rate. Meanwhile, the line of business is continuously developed, especially on Thai commercial banks service business. It change people's expenses and also emerge big amount of business capital every day. Business capital is a fundamental for financial and banking system. This is the reason that raises the modern technological management awareness. The main idea is to improve service accuracy, service convenience, and various service to gain customer satisfaction (Sang-aram, 2007).

Service quality was compare between customer's expectation and customers receive. If the customer satisfied, they would continue to use the service. On the other hand, if the customers feel less satisfied with the service, they would cancel or move for others. Zagel (2015) also stated that service quality was important for making differences in service business, thus service providers must keep the service quality at the high level.

In order to fulfill the innovation movement in financial management, bank of Thailand had supported the commercial banks on applying technological innovations through financial processes. At the same time, bank of Thailand also need to prevent technological threats. In present, technological innovation had an important role in all financial and banking processes. Internet banking and mobile banking were the examples of banking technological innovations. According to Mckinsey & Company report (2015), it showed that Thailand has proportion of people using digital banking through personal computers or smartphones doubled from 2011 to 2014. Their survey also revealed that the growth of digital banking points to a diminishing reliance among consumers on branch networks, but physical bank offices are unlikely to disappear. Moreover, Bank of Thailand also provide new form of innovation like financial technology (fin tech). They were planned on distribution channel and its flexibility, and venture capital investment (Bank of Thailand, 2015).

However, commercial banking business was extremely a competitive business. All organizations require adjusting their internal management to increase their advantages. At present, each commercial banks need to set up the strategies to develop organizational quality continuously. All banking companies plan to provide the excellent customer service in order to maintain and increase their market share.

Objectives of the study

1. To study the service quality perception of commercial banks in Thailand.
2. To study the effects technological innovation on the service quality perception.

Theoretical Background

Service quality occurred from customer expectation towards service. In other word, quality is the best product or service based on customer requirement and service perception (Berry et. al, 1990). Parasuraman et al. (1988) defined that SERVQUAL consisted of 5 dimensions; reliability, assurance, tangibility, empathy, and responsiveness. It was related to Jiang (2013) research on the tourist satisfaction research of service quality of cruise ports - a case of Wusongkou cruise port in Shanghai, China. His research revealed that service quality was including tangibility, credibility, responsiveness, assurance, and empathy. Wang and Cheng (2012) and Liao and Hsieh (2011) were agree that relationships among perceived quality, customer satisfaction and customer retention were effect on customer royalty through service quality. Ziethaml et. al (1990) had develop 5 dimensions as follows.

Dimension 1: Tangibility concerns the physical facilities, equipment, personnel and materials that can be perceived by the five human senses.

Dimension 2: Reliability translated into the ability of the supplier to execute the service in a safe and efficient manner. It depicts the consistent performance, free of non-compliance, in which the user can trust. The supplier must comply with what was promised, without the need for rework.

Dimension 3: Responsiveness refers to the availability of the provider to attend voluntarily to users, providing a service in an attentive manner, with precision and speed of response. It concerns the availability of employees of the institution to assist users and provide the service promptly.

Dimension 4: Assurance: it is identified as the courtesy, knowledge of employees and their ability to convey trust.

Dimension 5: Empathy related to whether the organization cares for the user and assists him in an individualized manner, referring to the ability to demonstrate interest and personal attention. Empathy includes accessibility, sensitivity and effort in understanding the needs of users.

Furthermore, Akhisar et al. (2015) claimed that applying modern technological innovations will emerge new service innovations. Banks is focusing more on technology usage to increase customer satisfaction. Rhodes et al. (2008) further indicated that technical innovation use in business process will upgrade speed of service.

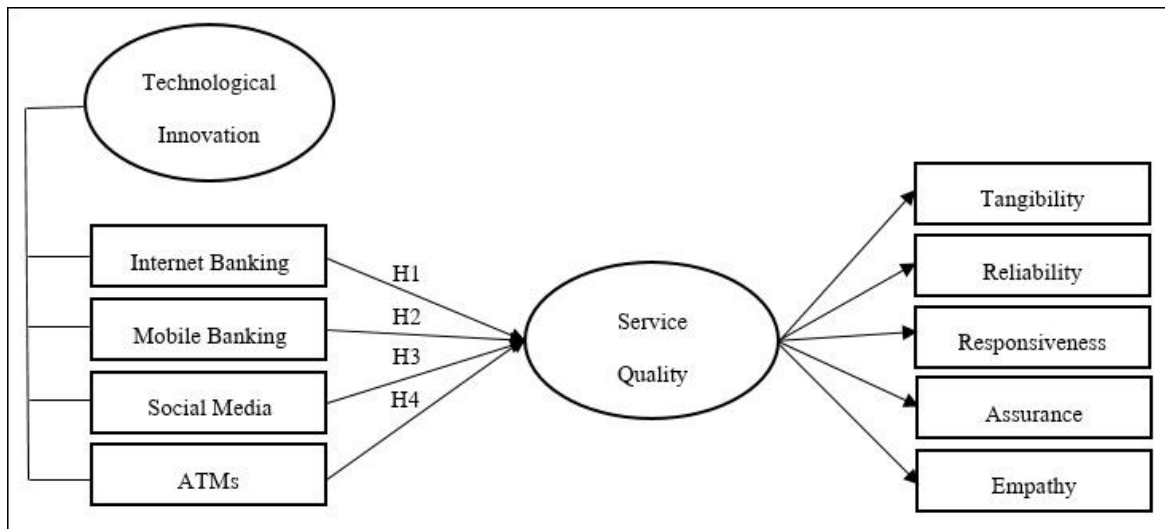
Technological innovation was originated from technology improvement. According to Weigelt and Sarkar (2012) shown that the technological innovation will begin to rise in the organization. This reflected the technological innovation development was highly important to every organization. It had power to gain more competitive advantages and also improve working process. Nowadays, all financial transactions allow performing via online tools. It means that user no need to go to bank to do their transactions. Technology had change rapidly the past few years in order to fulfill the customer requirements. On the other hand, technology also drives business in the better

way (Ankrah, 2012). The researchers and scholars had determined observed variables for technological innovation as follows; internet banking, mobile banking, social media, and ATMs (Liu et al. (2015); Ankrah. (2012); Akhisar et al. (2015); Ilo et al. (2014)).

Conceptual Framework

The research had investigated on concept, theory, and the related research to produce the conceptual framework as presented in Figure 1.

Figure 1 Technological innovation and their associated research hypothesis



Research Hypothesis

Hypothesis 1: Internet banking has a positive influence on service quality.

Hypothesis 2: Mobile banking has a positive influence on service quality.

Hypothesis 3: Social media has a positive influence on service quality.

Hypothesis 4: ATMs has a positive influence on service quality.

Research Methodology

This research combined both quantitative and qualitative research methods. The populations of this research were the commercial bank managers from 14 Thai banks, which also included 2,068 branches. The sample of this research is calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level. From the use of accidental sampling, the questionnaires from 424 participants were used.

Data Collection

Questionnaires were used for gathering primary data, it containing 7 points of personal information in Part 1 (demographic information), 18 items in Parts 2 (technological innovation), with another 24 items in Parts 3 (service quality), in total of 49 items which is presented in Table 1.

Table 1 Technological innovation questionnaire sections

Parts	Items	Variables	Description	NO. of items
1	1 - 7	Demographic information		7
2	8 - 25	Technological innovation	Internet banking	18
			Mobile banking	
			Social media	
			Automated teller machines	
3	26 - 49	Service quality	Tangibility	24
			Reliability	
			Responsiveness	
			Assurance	
			Empathy	
			Total	49

For this research, the measurement instrument or questionnaires utilized was prepared from the literature. This questionnaire was used to investigate how and which technological innovation variables affected service quality perception. The responses to the questions focal constructs used a seven-point Likert scale (1932) with rating statements 1-7 (Best and Kahn, 1998), with 1 = 'Strongly Disagree' to 7= 'Strongly Agree'.

Table 2 Technological innovation questionnaire rating scale, range, and description

Likert Scales	Range	Description
7	6.51 - 7.00	Strongly Agree
6	5.51 - 6.00	Agree
5	4.51 - 5.50	Agree Somewhat
4	3.51 - 4.50	Undecided
3	2.51 - 3.50	Disagree Somewhat
2	1.51 - 2.50	Disagree
1	1.00 - 1.50	Strongly Disagree

The researcher had develop the questionnaire based on theory as presented in Table 3.

Table 3 Technological innovation questionnaire development

Variables	Observed variables	References
Service quality	1. Tangibility 2. Reliability 3. Responsiveness 4. Assurance 5. Empathy	Marie et. al (2014); Gambo (2013); Vera & Trujillo (2013); Ramayah et. al (2011); Ahmad (2010)
Technological innovation	1. Internet banking 2. Mobile banking 3. Social media 4. Automated Teller Machines : ATMs	Liu et al. (2015); Ankrah (2012); Akhisar et al. (2015); Ilo et. al (2014); Dauda & Lee (2015)

The researchers tested the questionnaires with a pre-test group of 30 bank managers, who were not subsequent survey participants, but were like the survey population and the in-depth interviews from 5 experts. Then, the researcher rectified the errors and calculated the reliability of the questionnaires by using the Index of Item Objective Congruence (IOC) and coefficient of Alpha (Cronbach, 1990). IOC results between of 0.69 – 1.00 were considered as verified. On the other hand, questions with an IOC below 0.6 were revised or were removed (Rovinelli and Hambleton, 1977). From even the most stringent criteria of Cronbach's Alpha, the study's questionnaires were deemed to be highly reliable as the score was 0.98.

Results

Demographic information

Table 4 Demographic information

Description	N	Percentages
Gender	(persons)	
Male	116	27.36
Female	308	72.64
Total	424	100.00
Age	(persons)	
Below 31	147	34.67
31 - 35	196	46.23

	36 - 40		36	8.49
	41 - 45		32	7.55
	46 - 50		12	2.83
	51 above		1	0.24
Total			424	100.00
	Min	Max	\bar{X}	S.D.
Age	29	56	37.07	5.58
Work Experience (persons)				
	Below 11		89	20.99
	11 - 15		228	53.77
	16 - 20		61	14.39
	21 - 25		33	7.78
	26 - 30		10	2.36
	31 above		3	0.71
Total			424	100.00
	Min	Max	\bar{X}	S.D.
Work Experience	7	36	14.06	4.95
Number of employees (branches)				
	Less than 11		188	44.34
	11 - 15		159	37.50
	16 - 20		60	14.15
	21 - 25		11	2.59
	26 - 30		3	0.71
	31 up		3	0.71
Total			424	100.00
	Min	Max	\bar{X}	S.D.
Number of employees	6	50	12.50	4.82

Description	Frequency	Percentages
Education Level	(persons)	
Bachelor degree	255	60.14
Master degree	168	39.62
Doctoral degree	1	0.24
Total	424	100.00

Regarding to Table 4, it was revealed that the total participants of 424 were consisted of 308 female (72.64%) and 116 male (27.36%), age range between 31-35 years for 196 persons (46.23%), work experience was 11-15 years for 228 persons (53.77%), number of employees less than 11 was 118 branches (44.34%), education level was at bachelor degree for 255 persons (60.14%).

In addition, commercial banking's customer segmentation was ranking as follows; private employees, business men, and merchants.

Table 5 Mean (\bar{X}) and standard deviation (S.D.) of technological innovation

Technological Innovation	Mean (\bar{X})	Standard Deviation (S.D.)	Level of Agreement
1. Internet Banking	5.95	0.96	High
2. Mobile Banking	6.05	1.00	High
3. Social Media	5.94	0.98	High
4. ATMs	5.97	1.06	High
Total	5.97	0.91	High

Regarding to Table 5, the results revealed that most of commercial banks managers had opinions towards technological innovation at high level (\bar{X} =5.97). Furthermore, the results claimed that internet banking was maximize among others at high level (\bar{X} =6.05) and the least was social media (\bar{X} =5.94).

Table 6 Mean (\bar{X}) and standard deviation (S.D.) of service quality

Service quality	Mean (\bar{X})	Standard Deviation (S.D.)	Level of Agreement
1. Tangibility	5.83	1.02	High
2. Reliability	5.99	0.99	High
3. Responsiveness	6.09	1.01	High
4. Assurance	5.96	0.97	High
5. Empathy	5.98	0.99	High
Total	5.97	0.93	High

Regarding to Table 6, the results revealed that most of commercial banks managers had opinions towards service quality at high level ($\bar{X}=5.97$). Furthermore, the results claimed that responsiveness was maximize among others at high level ($\bar{X}=6.09$) and the least was tangibility ($\bar{X}=5.83$).

Hypothesis testing results

The researcher had evaluated the data for multiple regression analysis that is independent variables must have the linear relationship and no multi collinearity occurred. Variance inflation factors (VIF) was considered for the variables. It had VIF at 4.276 and tolerance at 0.234-0.327, which related to the theory ($VIF < 10$ and tolerance was 0 to 1) (Vanichbuncha, 2008). This determined that each independent variable was not influence by any other independent variables. Skewness and kurtosis test was also utilized for normality test. Result showed that overall of technological innovation has normal distribution since skewness value (s) = -1.136 and kurtosis (k) value = 0.970. Specifically, internet banking has s = -0.985 and k = 0.438; mobile banking has s = -1.40 and k = 2.129; social media has s = -0.969 and k = 0.493 and ATM has s = -1.325 and k = 1.947 respectively.

Regarding to Table 7, analysis of variance (ANOVA) concluded that internet banking, mobile banking, social media, and ATMs had significant influence on commercial banking service quality at level 0.01.

Table 7 Analysis of variance results (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	272.280	4	68.052	314.969	.000***
	Residual	90.529	419	.216		
	Total	362.737	423			

a. Dependent Variable : Service

b. Predictors : (Constant), Automated Teller Machines, Mobile Banking, Internet Banking, Social Media

*** $p < .001$

Table 8 Multiple regression analysis results

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.784	.151		5.193	.000***		
Internet Banking (X_1)	.274	.042	.285	6.506	.000***	.310	3.224
Mobile Banking (X_2)	.012	.042	.013	.291	.771	.287	3.481
Social Media (X_3)	.300	.048	.317	6.280	.000***	.234	4.276

ATMs (X_4)	.284	.037	.326	7.643	.000***	.327	3.055
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* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

R ²	Adjusted R Square	SEE	F	Sig. (F-test)
0.0750	0.748	0.464	314.969	0.000

The researcher use stepwise regression model to investigate on relationships between variables, then tested the research hypothesis by using t-statistic.

H1: Internet banking has a positive influence on service quality at significance level 0.001 and regression coefficient (B) was 0.274.

H2: Mobile banking has no positive influence on service quality and regression coefficient (B) was 0.012.

H3: Social media has a positive influence on service quality at significance level 0.001 and regression coefficient (B) was 0.300.

H4: ATMs has a positive influence on service quality at significance level 0.001 and regression coefficient (B) was 0.284.

Discussion

According to the research, results confirmed that effect of technological innovation was highly influence on service quality perception, especially through social media. This was supported by Dauda and Lee (2015), they stated that the immediate responsiveness via social media will develop service quality. Moreover, social media had ability in connecting all communication together that reduces limitation in approaching banking channel. Ankrah (2012) claimed that technological innovation was use worldwide nowadays. ATMs had component as automated system, electronic networks, and electronic funds transfer (EFTs). Emerging technologies was performed via electronic banking (E-Banking) in form of internet banking, mobile banking, and social media.

Results revealed that social media of bank play most importance role for engaging their customers and creating the service quality perception and followed by ATM and Internet banking. These findings implied that current customers adopt themselves with banking innovation like social media, Internet banking. However, ATM or a traditional technology remains a significant service for them. In order to stimulating service quality perception, the executive level of bank should consider to develop a financial literacy through digital innovation for their employee and customers.

Conclusion

Multiple regression equation from this study estimated was $R^2 = 0.0750$. This mean that independent variables had effect on service quality variation at 75% and 25% for other. The standard error of the estimate (SEE) was 46.40%.

Internet banking, social media, and ATMs had a linear positive influence towards commercial banks' innovation and technology at significance level 0.001. Furthermore, the regression coefficient (B) were 0.274, 0.300, 0.284 consequently. This implies that if internet banking increase for 1 unit, service quality would also increase at 0.274 unit. Social media increase for 1 unit, then service quality increase at 0.300 unit. ATMs increase for 1 unit, service quality would increase at 0.284 unit accordingly.

Regarding to relationship of variables analysis, the researcher able to conclude the equation of the effect factors that influence on commercial banking service quality as;

$$Y = 0.784 + 0.274X_1^{***} + 0.012X_2 + 0.300X_3^{***} + 0.284X_4^{***}$$

$$X_1 = \text{Internet banking}, X_2 = \text{Mobile banking}, X_3 = \text{Social media}, X_4 = \text{ATMs}$$

$$Y = \text{Service quality perception}$$

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