

An Evaluation of Internet Banking in New Zealand

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Abstract

This paper examines how New Zealand banks enhance their retail banking services through the Internet. Seven NZ online banks were studied in terms of their web sites' effectiveness, functionalities and Internet strategies. The functionality was examined by evaluating banks' web sites using a tailored electronic commerce model. The effectiveness was surveyed utilising a judgment sample of actual and potential retail Internet banking customers.

Main factors that inhibit the adoption of I-banking in NZ are security, doubt about the complication of Internet banking and the ability to bank using other facilities. Other important factors that customers use to judge the performance of retail I-banking services are response time, services free from technical problems and up-to-date information.

NZ banks perform extremely well in providing up-to-date information. However, further improvements on security, download time, response time and the ability to provide services free from technical problems should be considered in order to satisfy customers' requirements.

1. Introduction

The global growth of electronic commerce (e-commerce) shows that people are becoming dependent on the Internet for communications and services. In New Zealand (NZ), more than 50 percent of the populations have Internet access and 34 percent use it on a regular basis [1].

Most organisations from different sectors realise the opportunity of using the Internet as another channel for business operation. Banking is one of the sectors that is leveraging the powerful capability of the Internet. It is believed that the Internet channel can help banks to maintain profitable growth by automating work done by employees, reduce cost and retain customers simultaneously [2],[3]. An Internet transaction only costs a bank five cents while a paper transaction at a branch costs about one dollar [3]. Greater reliance on

Internet banking (I-banking) may allow banks to reduce expenditure on "bricks and mortar," thereby generating lower expenses [4].

The adoption of ATM and EFTPOS facilitates banks to encourage their customers to use more cost-effective services such as phone banking and I-banking to give customers 24-hour access. The common services of retail I-banking include checking account balance, transferring money between designated accounts, viewing bank statements and making payments. The aim of this study is to explore and develop an understanding of the existing New Zealand Internet retail banking system for improving its utilisation and services provided. Retail I-banking covers everything normally done by a branch teller but not value-added I-banking services such as share trading and insurance purchases.

2. NZ Internet Penetration and Connection

In 2000, about 200,000 New Zealanders used the Internet for banking [5]. The Dominion [3] emphasised that there are still barriers for many people to use I-banking because of the cost of a personal computer and the cost of an Internet connection. It is found that support for I-banking in NZ is beginning to take off, with fifteen percent using it and 26 percent of those who do not, saying that they may adopt it in the coming year [6]. New Zealand has already achieved a significant level of Internet penetration and usage [7]. The cost of New Zealand Internet service providers (ISPs) has declined significantly over the past four years [7]. It is believed that the potential of I-banking can be supported by the current Internet penetration. The low ISPs charges will further enhance Internet usage and facilitate I-banking in New Zealand.

3. The Banking Sector

Chung and Paynter [8] identify that I-banking is a sector that is typified by high interaction and information. Although many banks offer I-banking

services, most of them have no idea what makes their Internet offerings unique [9]. Most I-banking services offer from different banks are perceived to be the same. Groenfeldt [10] says that effective I-banking is really all about the way customers think. I-banking is "easy to say; tough to do" [11]. Banks that offer Internet services must consider that interaction and information are important factors associated with their web sites [8].

Sheshunoff [12] says that being the first to convert the customer to I-banking confers significant competitive advantage. The products and services offer through the Internet can be priced differently from the traditional banking operations. A differentiated pricing strategy would encourage more customers to move to I-banking [13]. Adding more transaction abilities and better customer services should help to catch more I-banking customers [10].

The number of customers registered for I-banking is growing, but some of those registered, never use it, and some of those use it and then stop. To be effective, a bank needs to integrate the Internet with its marketing, delivery and customer service [10]. More recently, banks have added services that customers' needs, such as the ability to change their address, request a copy of their statement and order traveler cheques. It is believed that added functionality enhances I-banking [10].

4. New Zealand Banks

The seven NZ banks that currently offer retail I-banking services are Australia and New Zealand Bank (ANZ), Bank of New Zealand (BNZ), ASB, BankDirect (BD), National Bank of New Zealand (NBNZ), WestpacTrust (WPT) and TSB Bank (TSB).

Banks that failed to exploit the Internet's potential, risk being overtaken by those that understand the implications of e-commerce. The start of retail I-banking is slow in New Zealand and it is said that with the exception of ASB, New Zealand banks are two to three years behind their international counterparts [1]. ASB was the first New Zealand bank to offer retail I-banking services. This was commenced in mid 1996. In October 1997, ASB subsidiary, BankDirect followed [14]. It is the country's first and only 'virtual' bank without branches. ASB and BankDirect had about 60,000 customers in mid 2000 and their customer numbers are now doubling every six months [5]. NBNZ and BNZ, which went online late 1999, have 40,000 and 31,000 online customers respectively. ANZ launched their web

site in the first half of 2000, WestpacTrust soon after (it has 37,500 users already), and TSB, the last to launch I-banking, did so in early 2001.

5. Important Factors for I-banking

Performance measures enable banks to determine Internet customer satisfaction and identify the key drivers of customer retention so as to improve and maintain service level [10]. Without this information, successfully competing in the Internet business environment will be difficult. A bank needs to make its web site customer-centric in order to attract people to I-banking [15]. Robinson [16] suggests that banks must offer customers an "experience" – personalised and customised interactions that engage customers, capture their attention, and build an online relationship. Timely customer service support is also critical, as the Internet customer wants an immediate response to a request [13]. Customers express concern about the security of online transactions [11], [17], [15]. Security practices should be established and enhanced, especially when banks offer transaction-oriented services. While accumulating personal data, a bank should not underestimate privacy issues. Chung [18] and O'Connell [2] advocate that web sites should have a privacy policy to give confidence to their customers. Privacy and security are the most important issues that consumers have when dealing with I-banking [4], [19], [2]. These two concerns are the main barriers that constrain the uptake of I-banking. Consumers who have these concerns or less familiar with Internet technology need reassurance from their Internet banks. A secure and fully featured web site allows a bank to increase both revenue and customer loyalty [17].

6. Research Methodology

The first part of the research is to evaluate seven NZ banks regarding their I-banking web sites and services offered. This is an objective evaluation that aims to examine whether there is any difference among the seven NZ banks. Hersey's (cited in [20]) web site evaluation model was used as a basis for the evaluation in this part of the study. Components that appear in Hersey's general e-commerce evaluation model are *company information, customer information, product information, negotiation, order, payment, delivery, after-sales service, aesthetic effect, performance, ease of use, innovation and community*. These components are the starting

criteria that were used to evaluate the seven NZ banks. It is found that some components in the general Hersey's model are not appropriate for the banking industry. Hersey's model is thus tailored for this study to aid in evaluating the e-commerce banking web sites. Non-applicable components such as *negotiation* were dropped and components such as *order* and *ease of use* were expanded into several elements. Additional components suggested by other literature that are critical to the banking industry were added. An example is *legal statement* that was further expanded to three elements – *legal disclaimer*, *privacy policy* and *security policy*. This tailored Hersey's model (Table 1) was used to measure the performance of each NZ bank by recording the absence or presence of each element.

Components	Elements
Information	Company Information Customer Information Product Information
Legal Statement	Legal disclaimer Privacy policy Security policy
Order	Check account balance Transfer funds between accounts Check bank statement Purchase bank product (e.g. open an account) Download account information Make payment Order cheque or deposit book Request loan changes Cheque reconciliation Make IRD payment Change password After sales services (e.g. email enquires)
Ease of use	Frequent Asked Question (FAQ) Tutorial/Demonstration Search function Help function Navigation menu/buttons
Aesthetic effects	Graphics Animations
Performance	Update frequency (daily) Response time (within 5 seconds) Download time (within 10 seconds) Technical problems
Components	Elements
Others	Innovation features Competitions or rewards Community contribution

Table 1: Tailored Hersey's Model

The second part of the research is a survey that aims to obtain customers' perspectives regarding I-banking in NZ. The questionnaire was designed to incorporate elements in the tailored Hersey's model that allows customers to rate the performance of their banks. It captures customers' evaluation of a bank's effectiveness, satisfaction with current I-banking products, quality of online customer services and other related issues.

Internet users in NZ are the population of this study. It is believed that only limited categories of people, the computer literates, are more likely to have the information that is sought. Therefore, judgment sampling was employed as it allows the choice of subjects who are in the best position to provide the information required [21]. A subset (200) of advanced students and staff at the University of Auckland was thus selected to provide the information.

7. Web site Evaluation Results

Table 2 is a simple summation of elements for each bank based on the tailored Hersey's model in Table 1. The total number of element is the maximum score (32) a bank could get if all elements are present in its web site. The percentage score in the last row of Table 2 is the total number of presence divided by the maximum score (32). It reveals the performance differences among banks. Table 2 shows that BD scores the highest followed by ANZ. ASB is the third, BNZ and NBNZ are the forth, TSB is the sixth and WPT is the last.

Elements	ASB	ANZ	BD	BNZ	NBNZ	TSB	WPT
Company Information	1	1	1	1	1	1	1
Customer Information	1	1	1	1	1	1	1
Product Information	1	1	1	1	1	1	1
Legal disclaimer	1	1	1	1	0	1	1
Privacy policy	0	1	1	1	0	1	1
Security policy	1	1	1	1	1	1	1
Check account balance	1	1	1	1	1	1	1
Transfer funds between accounts	1	1	1	1	1	1	1
Check bank statement	1	1	1	1	1	1	1
Purchase bank product (e.g. open an account)	0	0	1	0	0	0	0
Download account information	1	1	1	1	1	0	1
Make payment	1	1	1	1	1	1	1
Order cheque or deposit book	0	0	1	0	0	0	0
Request loan changes	0	0	1	0	0	0	0
Cheque reconciliation	0	1	0	0	0	0	0

Elements	ASB	ANZ	BD	BNZ	NBNZ	TSB	WPT
Make IRD payment	0	0	0	0	0	0	1
Change password	1	1	1	1	1	1	1
After sales services (e.g. email enquires)	1	1	1	1	1	1	1
Frequent Asked Question (FAQ)	1	1	1	1	1	1	0
Tutorial/Demonstration	1	1	1	0	1	1	0
Search function	0	1	1	1	1	0	0
Help function	1	1	1	1	1	1	0
Navigation menu/buttons	1	1	1	1	1	1	1
Graphics	1	1	1	1	1	1	1
Animations	1	0	1	1	0	1	0
Update frequency (daily)	1	1	1	1	1	1	0
Response time (within 5 seconds)	1	1	1	1	1	1	1
Download time (within 10 seconds)	1	1	1	1	1	1	1
Technical problems	1	1	1	1	1	1	1
Innovation features	0	1	0	0	0	0	1
Competitions or rewards	1	1	0	0	1	0	0
Community contribution	1	0	0	0	1	0	1
Total number of presence	24	26	27	23	23	22	21
Score for each bank in percentage (%)	75	81.3	84.4	71.9	71.9	68.8	65.6

Table 2: Web Site Evaluation

The web site evaluation results (Table 2) denote the Internet capabilities/offerings of banks in an objective manner. Subjective customers' opinions were also surveyed. Their perceptions must either weigh some components/elements more highly than others or there must be a perceptible difference in the delivery of these components between banks. This next section describes the survey results.

8. Survey Results

One hundred and eighty seven questionnaires were returned and 184 are usable. Forty one percent of those surveyed had registered for I-banking and of the total nineteen percent had registered with more than one bank. Thirty nine percent claimed that they have used I-banking subsequent to registration. In contrast, 92 percent used ATM, 92 percent EFTPOS, 52 percent Phone Banking, 79 percent Counter Services, 45 percent Direct Debit, 47 percent Automatic Payment, and 41 percent Direct Credit.

8.1 The Usage of Different Banking Activities

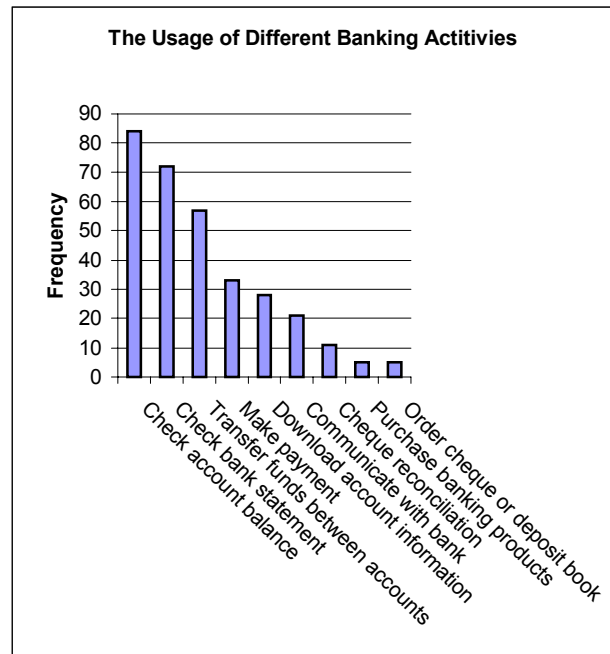


Figure 1: Usage of Different Banking Activities

Figure 1 shows that for the 39 percent that use I-banking, *check account balance* is the most frequently used banking service. The second and third popular services are *check bank statement* and *transfer funds between accounts* respectively. About 45 percent *make payments* and *download account statements into software packages*. *Order cheque or deposit books* and *purchase banking product* are the services that have very low usage compared to the other services.

8.2 Reasons for Not Registering for I-banking

Results indicate that 109 out of 184 respondents (59 percent) did not register for I-banking. These people were asked to provide explanations why they did not register. Table 2 indicates the mean of each reason measured by a scale from 1 indicating strongly disagree to 5 indicating strongly agree. Table 3 shows that *Unsure about the security of transactions* has the highest mean indicating that this could be the main barrier for those who did not register for I-banking. *Can do all banking in other ways*, *Have not tried it before*, and *Do not need instant 24 hours access to accounts* are other strong barriers that prevent people from registration.

Table 3 shows that *Have no access/limited access to Internet* and *Not aware of I-banking* are not the reason that prevents I-banking registration.

	Mean
Unsure about the security of transactions	3.65
Can do all banking in other ways	3.56
Have not tried it before	3.51
Do not need instant 24 hours access to accounts	3.42
Like to be able to talk to staff in person	3.21
Do not think I-banking is cheaper	3.17
I-banking offers a limited range of services	3.14
Too much hassle to register for I-banking	3.05
Uncertain the benefit of I-banking	2.99
Not sure how it works	2.76
I-banking is complicated to use	2.42
Not aware of I-banking services	1.95
Have no access/limited access to Internet	1.57

Table 3: Reasons for not registering for I-banking

Based on the survey result¹, a correlation is also created in order to understand the relationships between the likelihood to register for I-banking in the next twelve months and the reasons why people did not register. Table 4 shows the significant results.

	Correlations	p-value	Alpha level	Significant
Likelihood to register and Unsure about the security of transactions	-0.287	0.003	0.01	Yes
Likelihood to register and Too much hassle to register for I-banking	-0.19	0.048	0.05	Yes
Likelihood to register and Have not tried it before	-0.191	0.046	0.05	Yes
Likelihood to register and Like to be able to talk to staff	-0.214	0.025	0.05	Yes
Likelihood to register and Complicated to use	-0.185	0.054	0.05 0.1	No Yes
Likelihood to register and I-banking offers a limited range of services	-0.183	0.057	0.05 0.1	No Yes

Table 4: Correlations between the likelihood to register for I-banking versus the reasons that prevent registration

¹ Respondents were asked to indicate the likelihood to register for Internet banking in the next twelve months.

Table 4 shows that the correlation between the *likelihood to register* and *Unsure about the security of transactions* is significant at the 0.01 level (2-tailed). This indicates a 99 percent confidence in this correlation. *Unsure about the security of transactions* is the reason that is the most closely correlated with the *likelihood to register* indicated by the large correlation and p-value. The correlation between the *likelihood to register* and *Too much hassle to register for I-banking*, *Have not tried it before* and *Like to be able to talk to staff* are all significant at the 0.05 level (2-tailed), indicating a 95 percent confidence in these correlations. The correlation between the *likelihood to register* and *Complicated to use* is -0.185 with a p-value of 0.054. The correlation between the *likelihood to register* and *I-banking offers a limited range of services* is -0.183 with a p-value of 0.057. These two correlations are not significant at the 0.05 level as their p-values are larger than 0.05. However, these correlations should not be ignored as their p-values are just slightly over 0.05. They would be considered significant at the 0.1 level, indicating a 90 percent confidence on these correlations.

The above reasons outline why people did not register for I-banking, all have a negative correlation with the likelihood to register in the next twelve months. Customers are less likely to register for I-banking if they are *unsure about the security of transactions*, *like to be able to talk to staff in person*, *have not tried it (I-banking) before*, *feel it is too much hassle to register*, *think it is complicated to use* and *offers a limited range of services*.

8.3 The Importance of each element

The importance of each element to retail I-banking is measured in the survey (Table 5). The mean for each element is measured by a scale from 1 indicating very unimportant to 7 indicating very important.

Results show that the most (very) important aspects in terms of retail I-banking are *Security*, *Up-to-date information*, *Free from technical problems* and *Response time* (in decreasing order). All other elements were ranked Important, except *Attractive Graphics* (Neutral) and *The use of animations* (Unimportant). Although banks are active in incorporating animations in their web sites, open-ended questions found that customers do not perceive it as important because it increases the time to load a page.

	Mean
The importance of security	6.65
The importance of providing up to date information	6.33
The importance of providing internet services free from technical problems	6.21
The importance of response time	6.08
The importance of download time	5.83
The importance of ease of use	5.76
The importance of ease of navigation	5.73
The importance of provision of customer information	5.64
The importance of provision of bank information	5.47
The importance of range of banking activities/services	5.47
The importance of provision of product information	5.41
The importance of attractive graphics	4.09
The importance of the use of animations	3.32

Table 5: The importance of each element

8.4 The Performance for Each Bank (Customers' Perspectives)

I-banking customers were asked to rate the importance (Table 5) and performance of different elements of their respective banks. The combination of these denotes the total performance score for each bank (Figure 2).

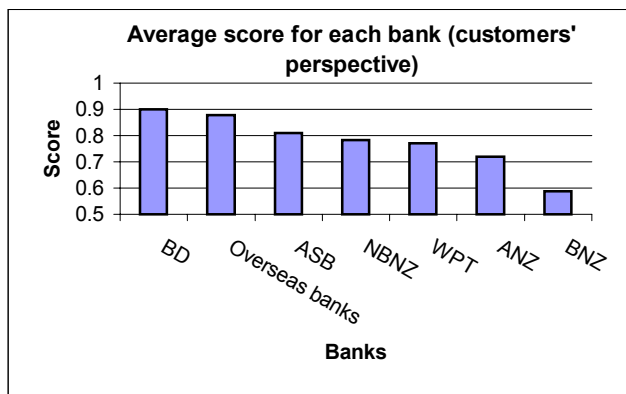


Figure 2: Average Score for Each Bank (Customer Perspective)

The result shown in Figure 2 indicates that BD has the highest score whereas BNZ has the lowest score. The performances of overseas banks are quite good, just slightly lower than BD. Amongst all NZ banks, BD has the best performance followed by ASB. NBNZ, WPT and ANZ are the third, fourth and fifth respectively. The performances for NBNZ, WPT and ANZ do not have an obvious difference from customers' perspectives.

However, the difference between the best (BD) and the worst (BNZ) NZ bank is 31 percent.

Table 6² shows the NZ banks' performance for each element. **Average performance** is the average mean of the performance score of each element for all NZ banks. This does not take account of the performance score of overseas banks. **Average performance score** is the score in percentage terms – average performance/maximum score (7). This performance score denotes how well NZ banks performed in terms of each element.

Elements	Average performance ³	Average Performance score	Average Importance ⁴	Average Importance score	Weighted performance score
Provides up-to-date information	6.43	92%	6.33	90%	83%
Provides secure transactions	5.69	81%	6.65	95%	77%
Easy to use	6.04	86%	5.76	82%	71%
Free from technical problems	5.48	78%	6.21	89%	69%
Has good response time	5.42	77%	6.08	87%	67%
Provides enough customer information	5.76	82%	5.64	81%	66%
Easy to navigate	5.66	81%	5.73	82%	66%
Provides enough bank information	5.52	79%	5.47	78%	62%
Provides enough bank's product information	5.57	80%	5.41	77%	61%
Provides a range of services	5.43	78%	5.47	78%	61%
Has good download time	4.69	67%	5.83	83%	56%
Has attractive graphics	4.71	67%	4.09	58%	39%
Uses animations	3.80	54%	3.33	48%	26%

Table 6: NZ Banks Performance on Each Element

Average importance shows the mean of the importance score of each element. The importance of elements takes account of the view from both current I-banking customers and those that had not registered for I-banking. **Average importance score** shows the score in percentage terms – average importance/maximum score (7). This importance score denotes the differences among elements in terms of its importance to I-banking.

Weighted performance score shows the relative performance of each element for all NZ banks. The performance score times the importance score calculates it. This allows the comparison of elements' performance

² All figures in Table 6 were retrieved from the customer survey.

³ The maximum performance score is 7 indicating strongly agree and the minimum performance score is 1 indicating strongly disagree.

⁴ The maximum importance score is 7 indicating very important and the minimum performance score is 1 indicating very unimportant.

when their respective importance scores are taken into account. *Providing up-to-date information* (83 percent) is the element that performs the best amongst all elements. *Security* (77 percent) is the second best and *ease of use* (71 percent) is the third. Although the *provision of secure transactions* (81 percent) has a lower performance score than the *ease of use* (86 percent), it has higher weighted performance score as *security* is considered more important than the *ease of use*. NZ banks thus rate better in *security* than *ease of use*.

The use of animations (26 percent) has the lowest weighted performance score indicating that it is the least important/worst-performed element for NZ banks. *The provision of attractive graphics* and *good download time* are the second to the last and the third to the last respectively. Although *the provision of attractive graphics* (67 percent) has the same performance score as *the provision of good download time* (67 percent), it has a lower weighted performance score (39 percent) because *the provision of good download time* (56 percent) is considered more important than *the provision of attractive graphics*.

Note that **performance score** shows how well each element is performed by NZ banks, as opposed to the relative performance of elements as shown in the **weighted performance score**. *Provides up-to-date information* (score 92 percent) indicates that NZ banks perform extremely well for this element. Elements that score 80 percent or higher are *Easy to use* (86 percent), *Provides enough customer information* (82 percent), *Provides secure transactions* (81 percent), *Easy to navigate* (81 percent) and *Provides enough product information* (80 percent). These elements are quite well performed. Elements that score 70 percent or higher are *Provides enough bank information* (79 percent), *Free from technical problems* (78 percent), *Provides a range of services* and *Has good response time* (77 percent). *Has good download time*, *Has attractive graphics* and *the use of animations* score 67 percent, 67 percent and 54 percent respectively. It is obvious that NZ banks do not perform so well on these elements.

8.5 Hypotheses Results

Hypotheses were tested based on the survey results. Table 7 shows a summary of the hypotheses results. H_1 and H_3 indicate that the length of I-banking use⁵ is not

⁵ The length of Internet banking use denotes how long one has been using Internet banking.

related to future usage⁶ and the overall satisfaction⁷. H_2 shows that the overall satisfaction is however related to future usage. It seems that the more a customer is satisfied with the retail I-banking services provided, the more likely he/she will continue to use the services in the future. H_4 , H_5 and H_6 show that whether a customer will register for I-banking is related to his/her age and his/her highest level of education but not his/her income. Survey results indicate that young customers (under 20) are less likely to register whereas customers with the highest level of education are more likely to register. H_7 and H_8 denote that registration for I-banking is unrelated to the usage of ATM and EFTPOS. However, H_9 indicates that the use of phone banking is related to the registration for I-banking at the 0.1 alpha level. Phone banking customers are more likely to register for I-banking than non-phone banking customers.

	Hypothesis	Test	p value / r_s	Alpha level	Rejection cut-off value	Significant/Correlated
The overall satisfaction versus the length of I-banking use	H_1	Chi square	0.183	0.05	N/A	No
The overall satisfaction versus future usage	H_2	Chi square	0	0.05	N/A	Yes
Future usage versus length of I-banking use	H_3	Chi square	0.436	0.05	N/A	No
Registered for I-banking versus age	H_4	Chi square	0.014	0.05	N/A	Yes
Registered for I-banking versus the highest level of education	H_5	Chi square	0.035	0.05	N/A	Yes
Registered for I-banking versus income	H_6	Chi square	0.118	0.05	N/A	No
Registered for I-banking versus the use of ATM	H_7	Chi square	0.555	0.05	N/A	No
Registered for I-banking versus the use of EFTPOS	H_8	Chi square	0.232	0.05	N/A	No
Registered for I-banking versus the use of phone banking	H_9	Chi square	0.089	0.05 0.1	N/A N/A	No Yes
Quantitative evaluation of web sites versus survey results (customers' perspective)	H_{10}	Spearman's rank correlation coefficient	0.543	0.05	0.829	No
Quantitative evaluation of web sites versus banks' size ranking	H_{11}	Spearman's rank correlation coefficient	-0.31	0.05	0.714	No
Quantitative evaluation of web sites versus length of time since launching retail I-banking	H_{12}	Spearman's rank correlation coefficient	-0.65	0.05	0.714	No

Table 7: Summary of the Hypotheses results

⁶ Respondents were asked whether they will use Internet banking in the next 12 months.

⁷ Respondents were asked to rate the overall Internet banking satisfaction of their banks.

H_{10} , H_{11} and H_{12} were tested using Spearman's rank correlation coefficient. H_{10} tests the correlation of ranking generated from an objective web site evaluation (section 7) and the banks' ranking from customers' perspectives (section 8.4). The result indicates that the site evaluation is not correlated to the banks' ranking generated from the customers' perspective. This implies that customers do not necessarily perceive a bank provides better services even though it rates better under an objective evaluation.

H_{11} tests the correlation of ranking generated from an objective web site evaluation (section 7) and banks' ranking in terms of size⁸. The results indicate that the objective score of a web site is not related to the banks' ranking in terms of size. It means that larger banks do not necessarily provide better services from the customers' perspective.

H_{12} tests the correlation of ranking generated from an objective web site evaluation (section 7) and banks' ranking in terms of the age of the Internet bank⁹. The result indicates that the maturity of I-banking is not correlated to the banks' offerings. Banks that launched I-banking earlier do not necessarily provide better retail I-banking services.

9. Conclusion and Recommendations

Banks must be noted that getting customers to register for I-banking does not mean that they will use the services. Although there is a reasonable adoption (39 percent) of I-banking in NZ, it still has the lowest usage amongst all banking facilities in NZ. The adoption of ATM, EFTPOS and counter services are about two times that of the I-banking adoption. Although ATM and EFTPOS are the most popular accessing banking facilities, results show that the usage of these facilities is not related to the utility of I-banking. This result is in doubt because almost everyone uses ATM and EFTPOS in NZ. This means that the chi-square test is unable to generate a reliable result regarding whether one is less likely to use I-banking if one does not use either ATM or EFTPOS. Nevertheless, a customer is more likely to register for I-banking if he/she is a user of phone banking¹⁰. Whether a customer will register for I-

banking is also related to his/her age and education level but not income. In terms of attracting more I-banking registration, banks are recommended to consider firstly target current phone banking customers and people aged more than 20 and with higher education background before aiming at lower educated and younger people.

Most customers are aware of the I-banking services offered by their banks but they do not register for I-banking. The more customers concern for security, the less likely they will be to register for I-banking. When promoting I-banking services, NZ banks should emphasise the security features implemented for I-banking transactions. This alleviates the security concerns and enhances the likelihood of registration.

ATM, EFTPOS and phone banking and counter services are the main banking facilities that customers prefer rather than I-banking. Customers do not need I-banking services because they could do whatever they want by using these banking facilities. In order to facilitate the utility of retail I-banking, banks should provide unique services¹¹ or discounted rates that are not offered in other banking facilities. Customers are more likely to register for I-banking if they think that I-banking offers services that do not offered via ATM, EFTPOS, phone banking and counter services.

Customers are less likely to register for I-banking if they consider it is complicated to use. Providing an I-banking demonstration at the bank's web site increases the likelihood of registration as it reduces customers' concerns regarding the complication of I-banking. All NZ banks provide I-banking demonstration except BNZ And WPT. Although BNZ and WPT provide FAQ, as do other NZ banks, they should also provide I-banking demonstrations to increase their I-banking customers.

Besides, the *security of transactions*, *up-to-date information*, *services free from technical problems*, *response time* and *download time* are also important than other factors such as the *provision of bank information* and *bank's product information*. Customers consider that factors such as *the use of attractive graphics* and *the use of animations* are not as important because they perceived that the use of animations slows down response time.

customer registration number and initial password through a touch-phone system.

¹¹ Two NZ banks have recently registered a service called FlexiBill offered by Esolutions. This service would enable users to click on details of their online statement to get an exploded view of individual items. For example, clicking on a monthly Telecom bill would reveal details of rental and call charges [22].

⁸ The amount of total assets is used to determine the size of a bank

⁹ The age of the Internet bank denotes how long a bank has launched its Internet banking services.

¹⁰ Some banks e.g. ANZ require you to first register for phone banking before you can register for Internet banking. They do so as they set up the

Most customers use retail I-banking to *check bank statements and account balances*. Some activities such as the *ordering of cheque or deposit books* and the *purchase of bank's products* are only offered by a particular bank (ANZ and BD respectively) but they have reasonable usage. This implies that customers consider these activities to be useful. Banks that do not offer these services should consider implementing them in addition to their current retail I-banking services. It was noted during the study that banks were adding features and functionality to their web sites.

In general, NZ banks perform extremely well in providing *up-to-date information* (scored 92 percent as shown in Table 6). It is shown that *the security of transactions* and the *ease of use* are considered in NZ banks' web sites. Customers consider that NZ banks perform quite well in terms of security, but as security is the most important concern, further improvement is required. NZ banks did not do well on providing good *download time* and the *provision of attractive graphics and animations* (only scored 67 percent, 67 percent and 54 percent respectively in Table 6). Considering that customers treat *download time* as an important factor, improvement in this area is necessary. Further improvement on *response time* and *providing services free from technical problems* is also required. NZ banks should concentrate on the improvement of these important factors rather than *providing attractive graphics and animations*. This is because Table 6 shows that customers perceive that providing attractive graphics and animation are the two least important elements in terms of I-banking.

Large banks do not always provide better retail I-banking offerings than small banks. It implies that small banks could provide better retail I-banking services if they organise and correctly manage their service offerings. Banks being early to provide retail I-banking services do not mean that they will provide better services than the services provided by later adopters. Banks that aim at providing services free from technical problems, good response time, up-to-date information, easy to use interface and the consideration of security issues are more likely to be accepted by customers.

It is found that banks do not provide retail I-banking services that meet customer requirements. Only offering a variety of services is not enough. Services must be of good quality in order to meet customer requirements and expectations. Banks are therefore encouraged to focus on factors that are considered important. These factors include the *security of transaction*, *response time*,

services free from technical problems, *up-to-date information* and the *ease of use*. The consideration of these factors in a bank's web site increases I-banking performance. Providing good quality of services is a strategy for banks to differentiate themselves from competitors.

BD is the only bank that has the same ranking (first) in the web site evaluation and in the customers' perspectives. This implies that BD is the best bank in the provision of retail I-banking services in NZ. ANZ ranks second in the web site evaluation but it ranks fifth in the customers' perspectives. The extreme difference indicates that ANZ offer a range of services and information but the service quality¹² is not as good as other NZ banks such as BD and Fastnet (ASB). A customer is more likely to continue to use retail I-banking in the next twelve months if he/she is satisfied with the services provided. Improving the service quality of retail I-banking could increase customer satisfaction and enhance the retention of current I-banking users.

In general, retail I-banking has a high potential in NZ. NZ banks should consider the importance of factors for designing, implementing, maintaining and promoting their websites. This would help to attract new registrants and increase retention.

9.1 Limitations

This is an exploratory study that aims to understand the current situation in terms of retail I-banking in NZ. Judgment sampling is employed to distribute the survey. It is not a probability sampling that ensures the elements in the population have some known chance of being selected as sample subjects. This indicates that the generalisability of this study is not guaranteed.

9.2 Future Research Implications

The exploratory nature of this study provides a basic idea in terms of retail I-banking in NZ. The results of this study give researchers more understanding of retail I-banking. Examples include the adoption and usage of retail I-banking, importance factors, reasons that prevent customers from registering for I-banking and NZ banks' performance. It is suggested that future research should

¹² One observation noted faults in ANZ's initial implementation. This may suggest that it is important to get it right the first time.

employ a probability sampling to ensure the generalisability of the findings.

Factors such as security and up-to-date information are considered very important. Future research in studying the variance explained for these factors on overall performance is advocated.

Rather than studying functionality from the customers' perspective, future research could study from the banks' perspectives. Interview with banks could be conducted to examine what are their aims and strategies in implementing I-banking. Considering that I-banking is growing in NZ, longitudinal study in this area is advocated. This allows researchers to study and examine how the uptake of I-banking proceeds.

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