

SAMPLE C

Diploma Programme subject in which this extended essay is registered: ITGS

(For an extended essay in the area of languages, state the language and whether it is group 1 or group 2.)

Title of the extended essay: THE INVESTIGATION ON SECURITY ISSUES OF ONLINE BANKING:
WHAT ARE THE IMPACTS OR VIRTUAL BANKING SECURITY ISSUES TOWARD ITS USER
IN MALAYSIA?

Candidate's declaration

If this declaration is not signed by the candidate the extended essay will not be assessed.

The extended essay I am submitting is my own work (apart from guidance allowed by the International Baccalaureate).

I have acknowledged each use of the words, graphics or ideas of another person, whether written, oral or visual.

I am aware that the word limit for all extended essays is 4000 words and that examiners are not required to read beyond this limit.

This is the final version of my extended essay.

Candidate's signature: _____

Date: 16th FEBRUARY 2009

IB Cardiff use only:

A: 44731 B:

Supervisor's report

The supervisor must complete the report below and then give the final version of the extended essay, with this cover attached, to the Diploma Programme coordinator. The supervisor must sign this report; otherwise the extended essay will not be assessed and may be returned to the school.

Name of supervisor (CAPITAL letters) _____

Comments

Please comment, as appropriate, on the candidate's performance, the context in which the candidate undertook the research for the extended essay, any difficulties encountered and how these were overcome (see page 13 of the extended essay guide). The concluding interview (viva voce) may provide useful information. These comments can help the examiner award a level for criterion K (holistic judgment). Do not comment on any adverse personal circumstances that may have affected the candidate. If the amount of time spent with the candidate was zero, you must explain this, in particular how it was then possible to authenticate the essay as the candidate's own work. You may attach an additional sheet if there is insufficient space here.

had involved in personal engagement
with considerable time and effort to
elaborate the issue of online banking in Malaysia ✓

I have read the final version of the extended essay that will be submitted to the examiner.

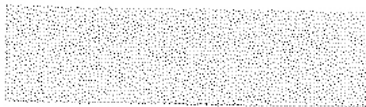
To the best of my knowledge, the extended essay is the authentic work of the candidate.

I spent 3-5 hours with the candidate discussing the progress of the extended essay.

Supervisor's signature: _____ Date: 23/02/09



42



INTERNATIONAL BACCALAUREATE

MAY 2009

EXTENDED ESSAY

SUBJECT – ITGS

TITLE: the investigation on security issues of online banking

**RESEARCH QUESTION: what are the impacts of virtual banking security issues toward
its user in Malaysia?**

NUMBER OF PAGES : 48

NUMBER OF WORDS : 3961

✓

R

Abstract

From the advent of the Internet, online banking has created an effective solution for user to perform their banking services. Fund transaction, pay bills, order aeroplane ticket and etc can be performing online. Thus, this technology has been implemented by banking not just in modern country but also in developing country; like Malaysia. However, the advent of online banking leaves a doubtful in users mind to use the service. This is because the security of the online banking itself. This essay discuss about the ***impact of online banking security issues and problems toward its user in Malaysia.*** RQ

This topic is important to study precisely because of the security issues has made users especially in Malaysia leave in doubt while performing their banking service online. ***Security threat*** such as user might get afraid of the hacker who might hack their account and steal their money or perform other illegal acts by using users account. Besides, ***identity theft*** always concerns the user. Their personal information might be steal by cyber thieves and causes them a lot of trouble like fraud, spam and etc. Not just that, ***online banking fraud*** and ***reliability of the online banking*** have also contributed in doubtful in users mind not to use online banking for their banking purposes. Afraid from being lead to fake website, online banking service bugs also concern the users. This essay structured in **five** sections; introduction, IT background, issues, solutions and conclusion.

This essay reaches the conclusion that even though there are a lot of security threats that make users afraid to use online banking service, the bank authorities will provides the best security system for the conveniences of the user. Plus, there are vital precautions for user to bear in their mind from being one of the cyber criminal victims. ✓ ok.

(297 words)

spam
not
explained
in EE

not in EE
no indication
of 'how'
research
done

Acknowledgement

First and foremost, I would like to take this opportunity to thank my extended essay supervisor, Ms. Azlinda Shafie for her assistance and corporation in completing my essay. I would also like to thank to the following group: library MARA College Banting for making available some materials and sources for my revision, friends at MARA College Banting especially who are taking the ITGS subject for helping me in some criteria.

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X not
in ToC

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Appropriate T of C.

Introduction of the issue

As the world nowadays is moving towards the new era of modernization, the Information Technology is also moving parallel to it. The revolution of the Internet services has changed the style of people works all over the world, especially on the business and any other area. One of the most important evolutions in this expects is the burst of Online Banking activity on the Internet. Online Banking or Internet Banking in other name has clearly implemented a brand new technology to the bank to expand their services to their respective customers via Internet connection. With the internet connectivity that is growing up every day, Internet has proof to give and offer much more opportunities to the bank as a convenient medium to perform any business transaction. Thus make the Online Banking will continue to develop the current banking system to fulfil their customer needs by providing better consumer services. *needs to be shown*

Online banking has provides a lot of services via internet to their customer. User can picture that most of the account holders of the certain bank start using these services as soon as it exists. The target user is not just for the big company that deal jumbo business but there are also another party that rely on it to perform their banking services. By looking at how this Online Banking works, it gives a lot of benefit rather than lose to the user. In fact, the benefit that users get from the advent of Online Banking, it is satisfied to say that this group of people are really need of the services because the can perform common banking transaction over the Internet anywhere and anytime. It gives them freedom to use the provided services. Looking how interesting Online Banking provides the services to people especially in helping the user's life, it undeniably can give them many advantages but at the same time lead them to chaos. This topic has come to be a lot interesting and significance for me to look forward to the impact that affect *unclear* *? chaos?*

Impact of Security issues of online banking
toward its user

not only for the stakeholder which is the bank, but also to the user. Simply to discuss about **the impact of online banking security issues toward its user.**

*broad
not the same as
the RA.*

For an overview, the impact of the Online Banking is about how secure is the system that the user used, fraud as well as identity theft and also the reliability of the online banking itself when they are using Online Banking services.

*some issues
identified*

In the following, an overview of Online Banking is presented, followed by the deep discussion on the issues that arise from it and also solution that will help the student crystal clear about Online Banking.

*student's?
vague.*

IT Background

What is online banking?

Generally, the idea of Online Banking is just like managing bank account at the virtual world without having to go to the real bank. **Online banking** (or **Internet banking**) allows customers to conduct financial transactions on a secure website operated by their retail or virtual bank, credit union or building society¹.

How to start online Banking?

Online banking required a user to have an account at a specific bank. For example, in Malaysia, Commerce International Merchant Bankers Berhad (CIMB) provides online banking services for its account holders to perform the online banking via its secure website. But before user can directly use the online banking service that is provided by the bank, requirement for the user to have an account at the bank is a must. In fact, the user also must have the ATM card as a requirement to get the electronic pin from the ATM machine. This e-pin is required for the user to log in into his account via online banking at the first time log in feature.² E-pin is the electronic pin that the user must get before they can use Internet Banking. E-pin works as a password that is need during the first time log in. What user needs to do to get their internet e-pin are (for this, example is from CIMBclicks)³:

1. At the CIMB ATM machine, insert ATM card and enter user existing ATM PIN.
2. Select "Others", then select "Internet e-PIN".

¹ Wikipedia the free encyclopaedia, *Online Banking*, 15 January 2009, available at http://en.wikipedia.org/wiki/Online_banking.

² CIMBclicks, *first time log in*, 18 January 2009, available at <https://www.cimbclicks.com.my/wps/portal/Registration>.

³ CIMBclicks, *FAQ – how do I create internet e-pin*, Available at <https://www.cimbclicks.com.my/faq.htm#9>

Impact of Security issues of online banking toward its user

3. Key in 6-digit e-PIN of choice. It must be different from the present ATM card PIN.
4. Confirm e-PIN by keying the same 6-digit number again.
5. If e-PIN creation is successful, the ATM will display the message "Internet e-PIN accepted".

After the user set up their e-pin, then they can log-in into their online banking account but they have to register their personal information again at the first time log-in session. This is important session because user has to key in their contact information and set up their new log-in password and User ID. Their personal information will be stored in the bank database. So every time user wants to access their account they have to key-in their User ID and password for authentication and verification purposes in order to grant the user access their account.

The screenshot shows a web browser window with the URL <http://www.cimbclicks.com.my/first/Registration>. The page title is "CIMB Clicks". Below the header, there is a navigation menu with "PERSONAL BANKING" selected. Under "Internet Banking", the "First Time Login" option is active. The form contains the following fields and instructions:

- BankCard / Credit Card No. / Loan No.***: A text input field with examples: e.g (BankCard) 501855200008887, e.g (Credit Card) 5104500100201580, e.g (Loan No.) 23439845893245.
- Internet E-Pin***: A text input field.
- CIMB Clicks ID***: A text input field.
- CIMB Clicks Password***: A text input field.
- Re-enter Password***: A text input field.
- Mother Maiden Name***: A text input field.

Instructions for the ID field: "The CIMB Clicks ID is the ID that you must use for subsequent sign-in sessions it should be in alphanumeric format with a minimum of 6 and a maximum of 32 characters and alphabets." Instructions for the password field: "Password should be 8 characters it has to consist of both alphabets and numerics characters."

Figure 1 – the first time log-in session at CIMBclicks website

source?

No explanation why e-Pin different from ATM access.

Features provided in Online Banking

The features:

1. Bill payment services
2. Airplane ticket order
3. Credit reloads
4. Housing loan service
5. Online bazaar
6. Online shared trading
7. Auto finances centre
8. Transfer fund between account
9. Apply for bank draft and banking transfer

*source ?
assume for CIMB.*

Impact of Security issues of online banking toward its user

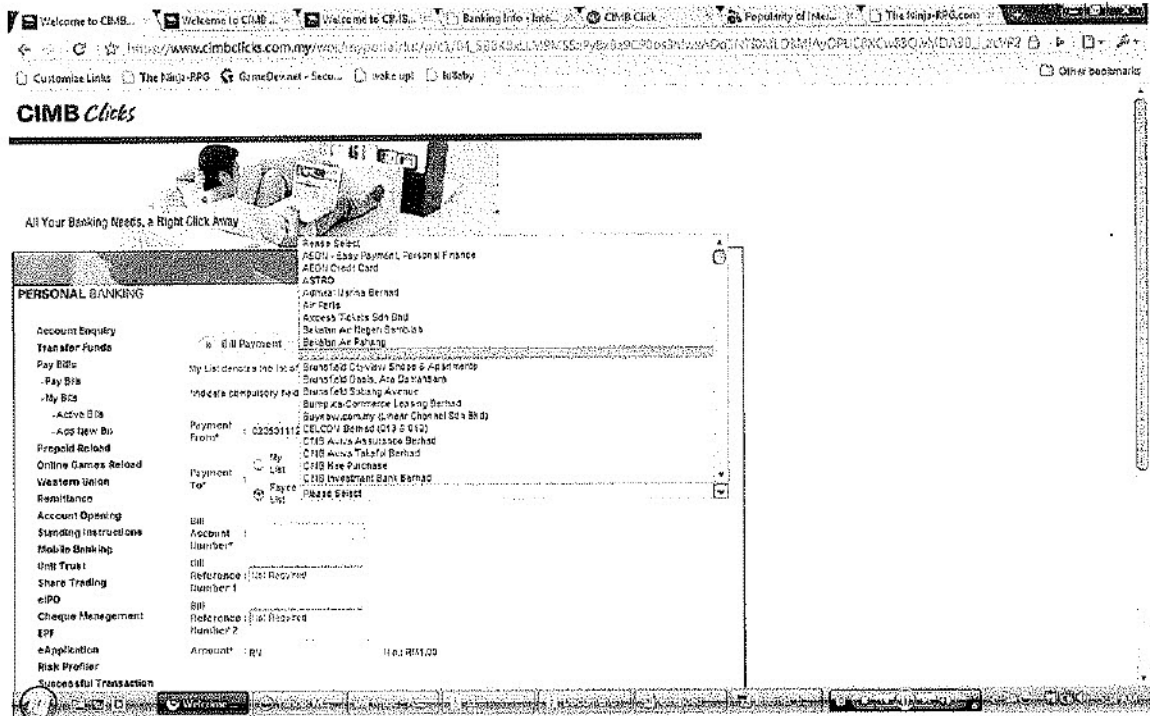


Figure 2 – Online bill pay payment at the CIMBclicks

source

Trend

From my research I have found that Online Banking is becoming popular day by day.⁴ Like *CIMBclicks*, the service is not just provided to the user to perform normal banking service but also it has added new features that can increase its popularity. The features that it has added is the reload point service via *CIMBclicks* for the online gaming player like *Ragnarok Online*, *Maple Story* and a lot more.⁵

vague

*How do these work?
no details.*

⁴ Uknetguide, *Popularity of internet banking growing*, 15 January 2009, Available at http://www.uknetguide.co.uk/Finance/Article/Popularity_of_internet_banking_growing.html.

⁵ *CIMBclicks, Online games credit reloads*, 15 January 2009, available at <http://www.cimbclicks.com.my/onlinegames.htm>.

R

Impact of Security issues of online banking toward its user

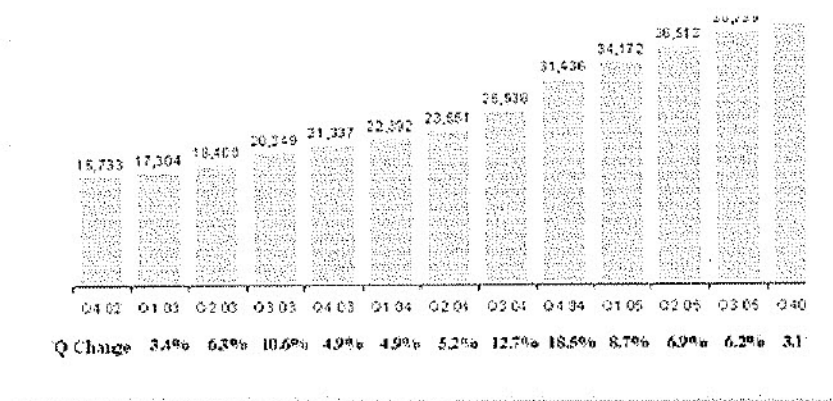


Figure 3 – Active online banking customer accessed their account at least once during three month period⁶

What % access online vs. brick-and-mortar access? no data / no stats

Is this for CIMB?

⁶ The Score, *Online Banking*, 16 January 2009, Available at <http://www.imediaconnection.com/content/9299.asp>.

seems generic.

Issues derived from Online Banking

Security threat, concerning the online banking user

From day to day online banking is trying hard to give the best service that they could to their customer. Since the advent of internet, security threat is a vampire or disease that frightened user from using the advanced technology. Hackers, security wise, unscrupulous people are lurking around, every inch on the internet. Sad to say, they are usually successful in getting what they want without leaving any trace⁷. Being anonymous all the time and place a landmine or trap on the internet just to make their own benefit. On contrary, they will be an extremely dangerous threat to the online banking user.

From my survey, more than 70% user concern about security threat:

80%

threat

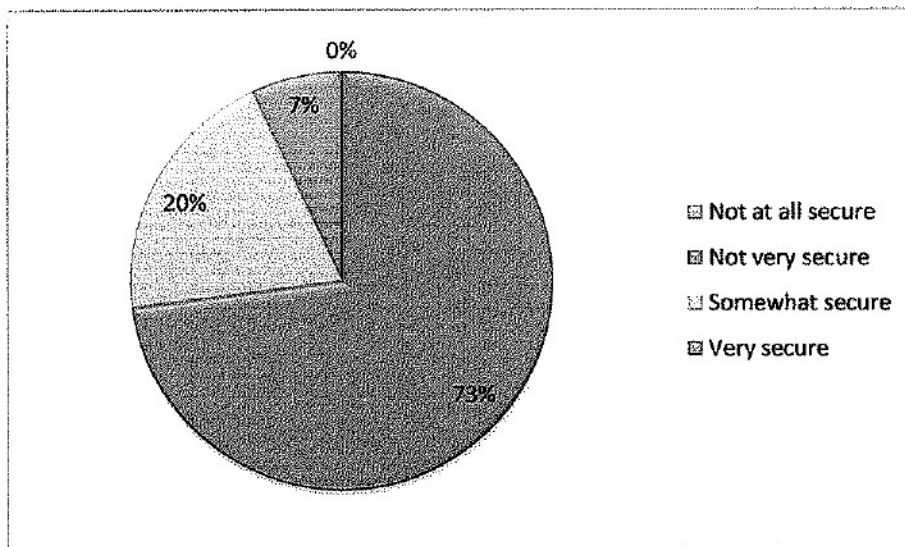


Figure 4 – Data on "How secure do you feel using online banking?"

⁷ Letter of the day, *We Must Keep Hackers Out of E-Government Net*, 12th May 1999 (NST), 15 January 2009, available at http://www.cybersecurity.my/en/knowledge_bank/news/1999/main/detail/1338/index.html.

The question is why these unscrupulous people hack?

The reason is simple; most of the hackers are trying to show off their skills by invading into online banking system. Second, probably they want to test their skill of hacking. Third, they want to test the security system of the online banking. Fourth, probably there are some crisis and they wanting to take revenge to the company. Last but not least, probably they want to make a profit for themselves. Most of them have different motives why they hack but for those who want to make a profit, they will do whatever it takes to get it.

Another question may arise from this which is how they hack into the system? One of the most favourable methods that are used by the hacker is *Denial-of-service attack (DoS attack)*. DoS attack is an attempt to make computer resources unavailable or malfunction to its intended user. It is likely to make the internet site or service from functioning normally or at all, temporarily or indefinitely.⁸ For an instance, within about a week in the year of 2000, a lot of web sites were shut down, some of them shut down for several hours because of the *Denial-of-service attack*. Victims included Yahoo! e-Bay, Amazon, E*Trade, Buy.com and others⁹. Just like the Online Banking security system, even though the website is pack with security layer, once the hacker get access through the bank database system, they can do many things. This is where one of the issues of the security stored in database. The hacker can change and alter the data inside the database system. They could also steal data such as user personal account information like username and password of the user online banking account. As the impact, it is not only give a bad consequences towards the user as they might lose their many if the hacker transferred to their accounts but the bank reputation will money

⁸ Wikipedia the free encyclopaedia, *Denial-of-service-attack*, 16 January 2009, Available at http://en.wikipedia.org/wiki/Denial-of-service_attack

⁹ Baase, Sara, *A Gift of Fire*, chapter 7 computer crime, 2003, 287p, 26 January 2009.

off-course
evidence!
needed!

This
is
NOT
researcher
← 5th
reason
is the
main
reason

There is no
evidence of
DoS being
the main
security
threat for
a bank.

? unclear

Impact of Security issues of online banking
toward its user

decreased as well because the lack of security system make the user's trust toward the bank also decrease.

Again, the online services such as Online Banking are vulnerable to the security threat if the security of the system implemented by the bank is weak. It is also important to the bank as the user is their asset in order to develop their banking service. Another impact will be discussed in the next issues.

*research needed on
what are the main
security threats for banks,
specifically*

Identity Theft

“Some will rob you with a six gun, and some with a fountain pen”

(Woody Guthrie, in “Pretty Boy Floyd”)¹⁰

Identity Theft is a crime used to refer to fraud that involves someone pretending to be someone else in order to steal money or get other benefits. The term is relatively new and is actually a misnomer, since it is not inherently possible to steal an identity, only to use it¹¹.

From the survey done, the user reacted as below:

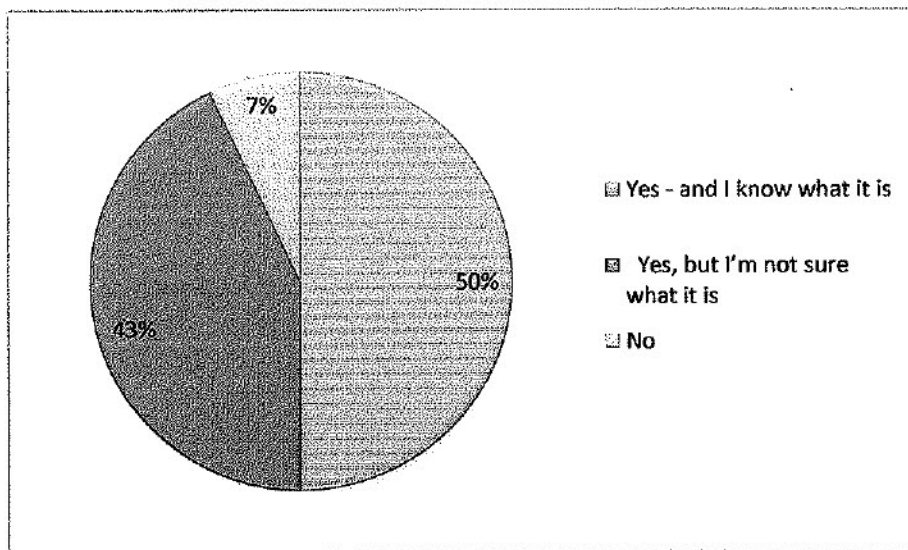


Figure 5 – Data on “Have you ever hear of *Identity Theft*?”

Like any other online services, in order to perform any online task for example user wants to use the online banking services. Before user can use the online banking service, the first thing that user has to do is registering our personal information in the bank database. This can be done for an instance first time login that is provided by *CIMBclicks*¹². Once the

¹⁰ Beekman, George and Michael J. Quinn, *Computer Confluence Seventh Edition*, chapter 10, Computer Security and Risks, 2006, pg387, 27 January 2009.

¹¹ Wikipedia the free encyclopaedia, *Identity Theft*, 28 January 2009, http://en.wikipedia.org/wiki/Identity_theft#Regional_Legal_responses.

¹² CIMBclicks, *first time log in*, 15 January 2009, <https://www.cimbclicks.com.my/wps/portal/Registration>.

user has registered their personal information in the database, when they want to access their online banking account they have to provide their username and password as a medium of verification to their account. It works like a key and lock. If the right key is inserted to the lock, of course it will open. The issue that arise from this is, the personal information of the user is very useful for a certain parties; unscrupulous people like hacker that intend to steal user personal information so that they can make profit from it. The research firm, which interviewed 1,000 American adults for the study, found that many consumers were worried that their personal information could either be stolen by hackers and phishes or sold to third parties by banks. Nearly 83 percent of those who conduct banking online reported such concerns, while 73 percent of respondents said personal information theft is a deterrent for them¹³. Based on the report, most of the users are very concern about their personal information that is stored in the bank database.

An example on identity theft is when a criminal obtains a loan from a financial institution by impersonating someone else¹⁴. The criminals pretend to be a victim by presenting his personal information like name, birth date, address, and so on that the lenders requires as a mean of establishing his identity. As long as all the information from the criminal is matches with the records, the lender will pay to the criminal. As the impact, the financial institution is never repaid, and the victim is wrongly blamed for defaulting on a loan he/she never authorized¹⁵.

*need a specific
example where this
has occurred. How
was the personal
info
obtained?*

¹³ C. Sharma, Dinesh, *Hacking fears bog down online banking growth*, Wednesday, September 07, 2005 09:44 AM, 20 January 2009, <http://www.zdnetasia.com/news/internet/0,39044908,39252935,00.htm>.

¹⁴ Wikipedia the free encyclopaedia, *Identity Theft*, 28 January 2009, http://en.wikipedia.org/wiki/Identity_theft#Regional_Legal_responses.

¹⁵ Wikipedia the free encyclopaedia, *Identity Theft*, Elaboration Financial Identity Theft, 30 January 2009, http://en.wikipedia.org/wiki/Identity_theft#Regional_Legal_responses.

Besides that, the Identity Card (IC) Number is the key to numerous records containing personal information.¹⁶ Malaysian uses the Identity Card (IC) number as their primary key is unique for each individual. This number is the key to their personal information. Once the criminal get their IC number, they will know other personal information about the user. In order to obtain the user they will use several methods for example by using *Social Engineering*- a slang for the use of deception to get individuals to reveal sensitive information.¹⁷ The criminal often declared themselves as the Official Bank Officer and ask the victim several questions regarding their personal information for example they asking the victim online banking account's username and password. At last, the account easily can be access by the criminal. In fact the criminal can do everything like transferring the money to another account, buying products and services without victim knowledge. As the impact, victims may lose their money and even worst they have to pay for what they never bought.

More
description
needed

example
needed -
generalities
without
specific details.

¹⁶ Baase, Sara, *A Gift of Fire*, chapter 7 computer crime, Identity Theft, 2003, 311p, 30 January 2009.

¹⁷ Beekman, George and Michael J. Quinn, *Computer Confluence Seventh Edition*, chapter 10, Computer Security and Risks, 2006, pg388, 30 January 2009.

Online Banking Fraud

From survey done, I found that online banking user does not know much about fraud. Therefore, this can make them vulnerable to cyber criminals. It is very worrying when the user does not know or does not have the knowledge about fraud. Fraudsters can easily take this as advantages for them to lure user into their booby trap.

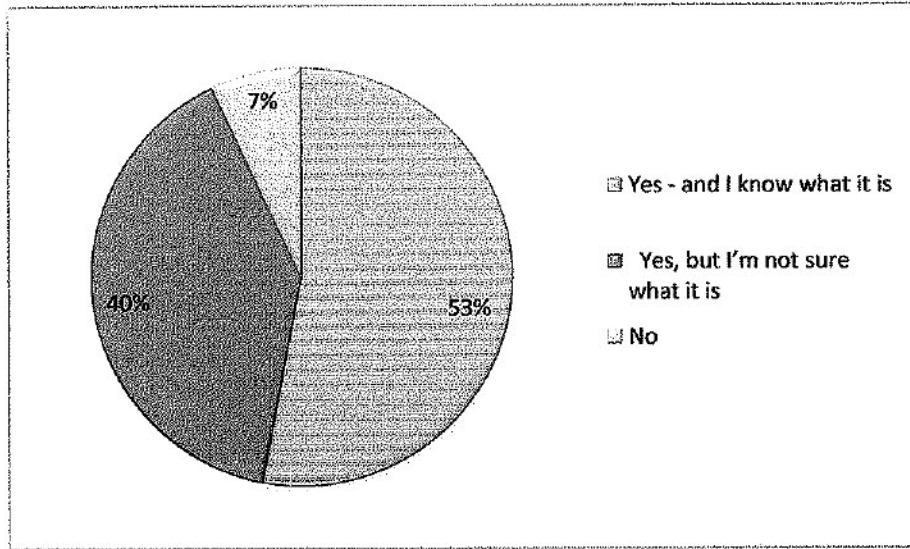


Figure 6 – Data on "Have you ever heard of the term Phishing?" ✓

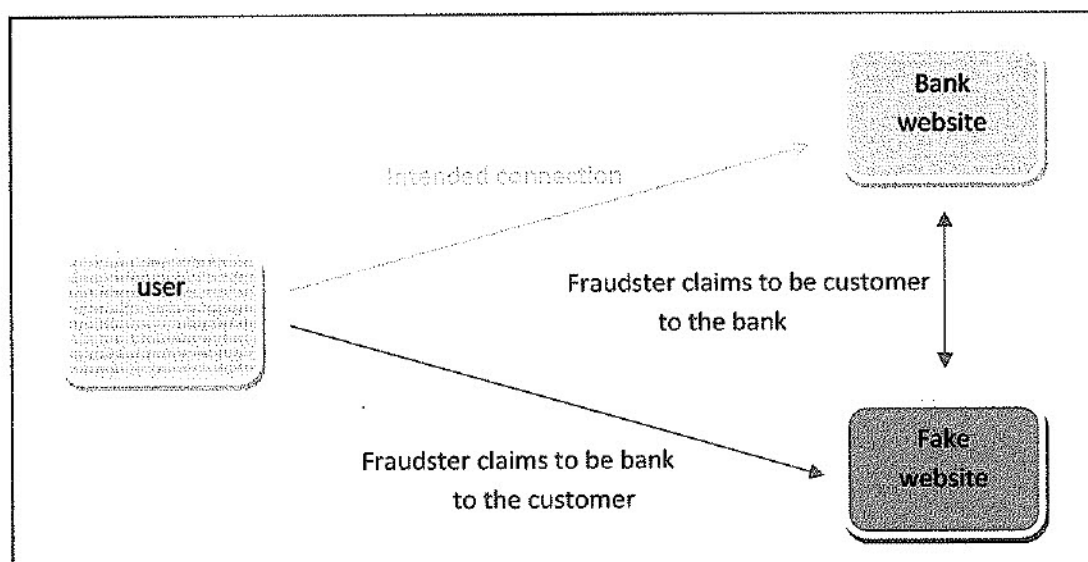
On the other hand, from the survey also, I found that even though the user does know much about the fraud but they are already concern of phishing. **Gone phishing**¹⁸ the common technique that is used to fraud the user. Most of the user is very familiar with this kind of fraud like a confirmation email is sending to them by fraudster purporting from the bank. This email forces the user to update their personal information like username and password or asking them to go and 'confirm' their security details.¹⁹ ?

*(Phishing)
not defined -
vague
example, little
reference to
how it is
done.*

¹⁸ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Gone Phishing, 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

¹⁹ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Gone Phishing, 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

As the technology become advance, the method for fraud is also moving parallel to it. A latest and fast growing online banking fraud is the so-called Man in The Middle (MitM) attack.²⁰ The method is simple; the criminal is simply set up a fake web site that is identically to the official online banking web site. How fraudsters commit fraud? Let say if the fraudster send the email to the user asking them to click on the provided link, supposedly the bank website. The fake website that is created by the fraudsters is very similar to the official online bank website. It may be even encrypted so the customer will see the expected padlock symbol in their browser.²¹ As the result, all the details are transmitted into the fake bank website and probably there is specially designed software connect to the real bank website, impersonate the user and make fraudulent transactions.²²



Man in the middle

source of graphic ?

²⁰ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Beyond Phishing Man in The Middle (MitM), 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

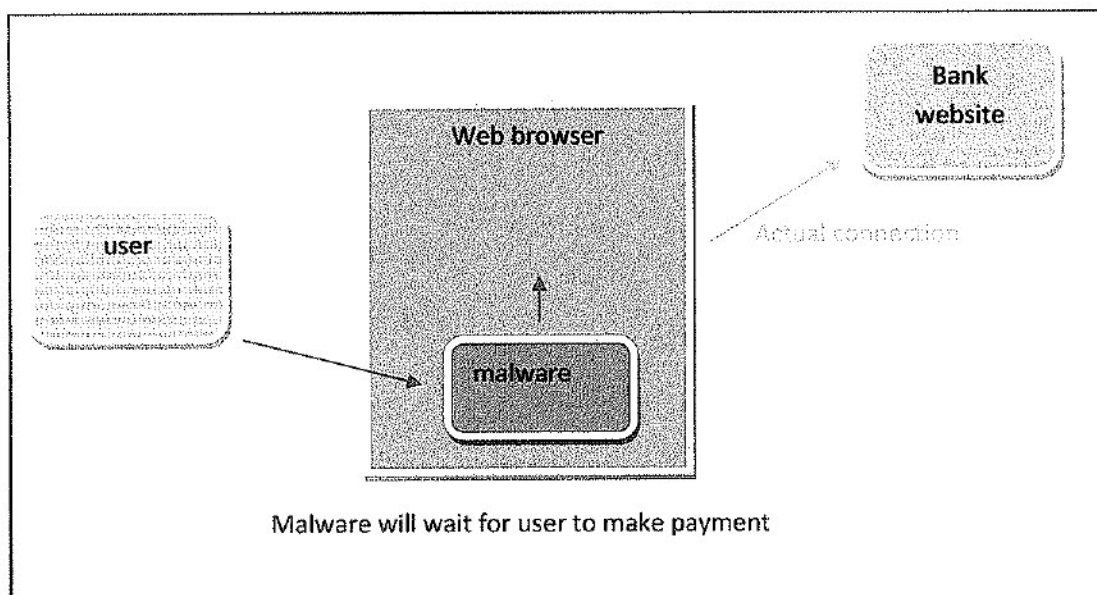
²¹ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Beyond Phishing Man in The Middle (MitM), 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

²² BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Beyond Phishing Man in The Middle (MitM), 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

R

Impact of Security issues of online banking
toward its user

Another tactic used by fraudster is Man in the Browser attack (MitB). MitB is security attack where criminal installed malware in user computer for example Trojan horse.²³ This occur when user opening email or downloading something from internet for example Trojan horse in the word document. The attack happened when user enters the URL into the web browser independently and user usually doesn't know the attack.²⁴ For example, the user make a money transfer to the another bank account on the web browser. The transaction will seem as the actual one but it has been altered by the malware. It intercepts the messages in the public key and retransmits them to the bank by substituting it with the bogus public key. The result is the same with the MitM but this attack is harder to detect.



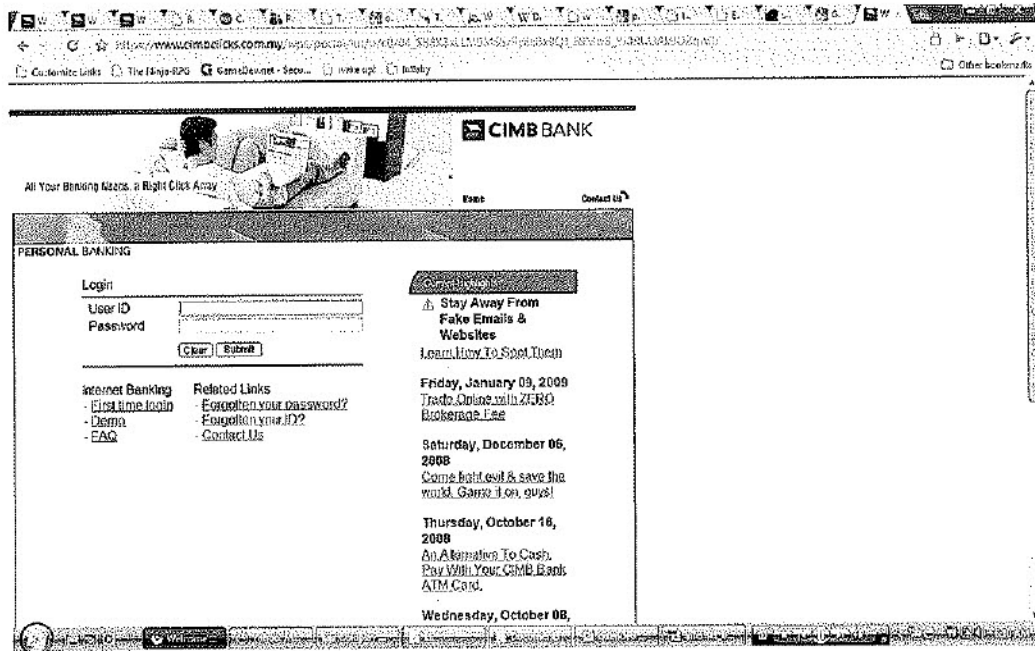
Man in the Browser

source of image

²³ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Beyond Phishing Man in The Browser (MitB), 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

²⁴ BEYOND PHISHING, DE-MISTIFYING THE GROWING THREAT OF INTERNET BANKING FRAUD, Beyond Phishing Man in The Browser (MitB), 1 February 2009, http://www.cronto.com/download/internet_banking_fraud_beyond_phishing.pdf.

Impact of Security issues of online banking toward its user



source

Figure 7 - the official website of CIMBclicks (Log in page)

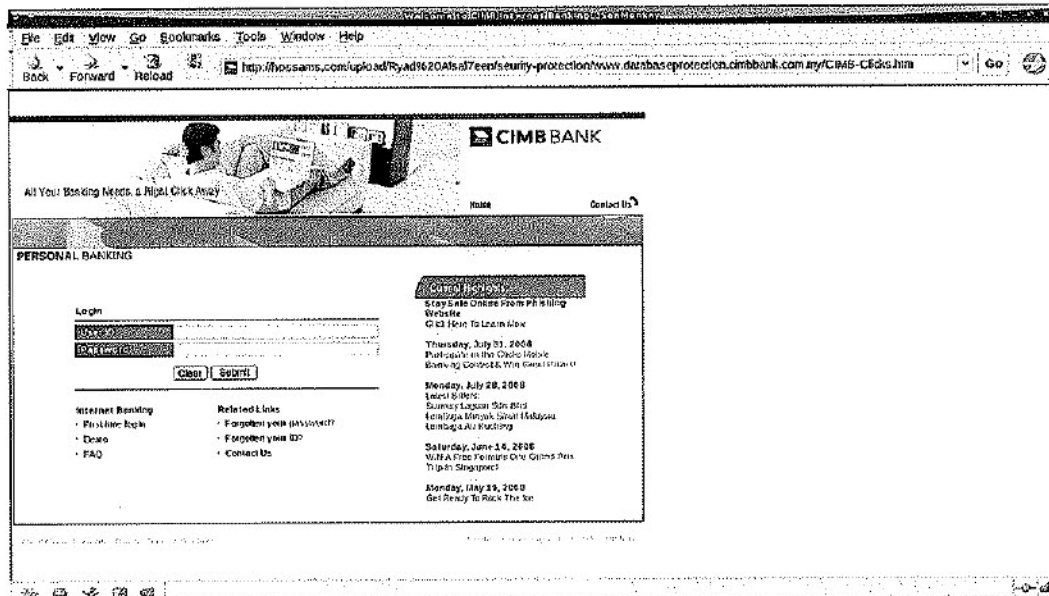


Figure 8 - Fake Log in page of CIMBclicks

source

*the URL of the fake website looks so suspicious compared to the official website. There is no pad lock symbol at the fake website either.

Other differences not indicated.

L

There are a lot of cases involving this kind of fraud. For example, according to the MSNBC, it is stated that nearly **2 million** consumers said they'd fallen for the trick during one 12-month period.²⁵ This is a very dangerous threat when online banking.

*Which
trick?*

The impact towards the user can be worst. Since the fake website are very identical to the real bank website, plus the encrypted method are used, there are also padlock symbol in the browser actually make user think that they are in a secure website. In addition, the implication toward the user for example, the user might lost their personal information like username, ID or even password (identity theft issue), probably the fraudster can sell the information to another party with higher demand, or even worst the user might suffer from psychological affected.

no details

Besides that, another issues that arrived from this is when the fraudsters create a fake website, there are actually duplicating everything from real bank website. This includes the bank company logo which is copyright protected.²⁶ When the fraudsters create the fake logo, it means that the fraudsters had done another illegal act. As the impact, even though the logo created is a fake one, the unaware user might be cheated by it. In fact, this will give advantages to the fraudsters to commit fraud.

example?

*logo on CIMB could
be an example.
again details
and description
missing*

²⁵ Sullivan, Bob, *Online bank fraud concerns consumers*, Account holder rights vary based on situation, 2004, 1 February 2009, <http://www.msnbc.msn.com/id/6713033/>

²⁶ *Online Protection Logo and Likeliness*, 2004, 1 February 2009, <http://www.centralbankbahamas.com/news.php?id=15151&cmd=view>

Impact of Security issues of online banking toward its user

[URGENT NOTICE] Verifying the integrity of your CIMBClicks account Inbox | X

From: **CIMB Group <team@cimbgroup.com>** Received: 5:24 PM (10 hours ago) Reply
To: undisclosed-recipients
Date: Sat, Dec 6, 2008 at 5:24 PM
Subject: **[URGENT NOTICE] Verifying the integrity of your CIMBClicks account**

Dear CIMB Bank customer,

We are hereby notifying you that we've recently suffered a DDoS-Attack on one of our's Internet Banking server. For security reasons you must complete the next steps to verify the integrity of your CIMBClicks account. If you fail to complete the verification in the next 24 hours your account will be suspended.

Here's how to get started:

1. Log in to CIMBClicks online account [\(click here\)](#)
2. You must request for TAC online via CIMBClicks - your TAC will be sent via SMS to the mobile phone number you registered at the ATM.
(you can find the 'request TAC' button in the left menu of your account)
3. Logout from your account and close the browser.
4. When you have received the TAC (Transaction Authorization Code) on your mobile phone, **Log in to our secured verification server** and submit the requested information (Account user ID, password and TAC). **CLICK HERE to go on our secured server.**
5. Please allow 48 hours for processing.

Please comply and thanks for understanding.
© 2008 CIMB Bank

Note: Please do not reply to this email.
This mailbox is not monitored and you will not receive a response.

Reply Reply to all Forward

Figure 9 - example of fraud email of CIMBclicks

difficult to read

source?

This requires explanation.

R

Reliability of the Online Banking

Based on the survey done, it is believes that the Online Banking user still has a slightly concern of the reliability of the online banking. This is not only because of the online banking threats but also another issue which is the reliability of the online banking system.

Since the online banking system is designed and created by a human being, it is must be a flaw somewhere inside it. This is simply because human being is not perfect and probably they will be a mistake done either intentionally or unintentionally. Let say, if a details send by the user to the online banking system is wrongly input by the system into the database. This will create a trouble for the user. For an instance, is the username and password of the user are mistakenly stored to the other user, indeed the user can not access his account. Thus caused the user to go to the bank and report the incident or even worst if the user is in foreign country it will caused a lot of trouble even the user still can contact the hotline services of the online banking. As the impact, of course the trust for the bank will declined and probably the user will use another reliable bank. The bank will lose it customer.

not related
to
online
banking
specifically

Besides that, there are also problems with the bank officers that handle the information about the account holders. The majority of the computer crimes are committed by the company insiders who are not reported to authorities even where there are caught red handed.²⁷ Let say if the clerks who are handling the user personal information sell the information to the other parties, the clerk may get paid for it but the unethical act that he/she performed is actually dangerous to the user. As the impact, identity theft can happen. Besides that, the user might get a lot of spams inside their mailbox. This is because of the sold information; the process of data mining can collect them to be used to send spams. Furthermore, there is also an issue when the bank does not report their unethical employee to

needs
to
be
researched
for
banks
and
CMB

²⁷ Beekman, George and Michael J. Quinn, *Computer Confluence Seventh Edition*, chapter 10, Computer Security and Risks, 2006, pg387, 1 February 2009.

Impact of Security issues of online banking
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the authorities because of the problem. To avoid embarrassment, many company covered up computer crimes committed by their own employees.²⁸

²⁸ Beekman, George and Michael J. Quinn, *Computer Confluence Seventh Edition*, chapter 10, Computer Security and Risks, 2006, pg387, 1 February 2009.

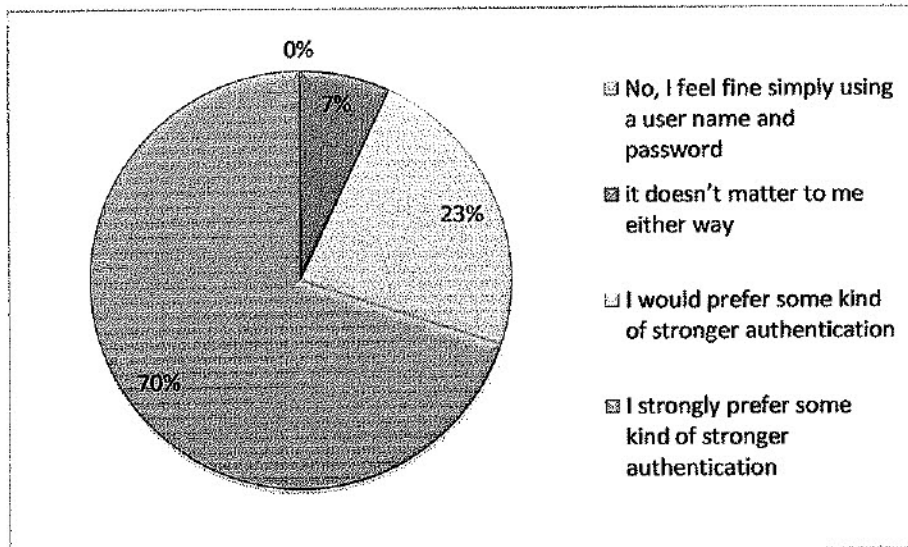
Summary of problems arise from the issues

There are a lot of issues that arise from online banking. The user personal information is at stake when a lot of cyber criminals are trying to get it by using different methods. All of these limitations will cause different degrees of damages not only to the user but also to the bank company.

Other side of online banking

It is true that, online banking can cause a lot of ethical and social issues that concerning user. Still online banking also bring a lot of advantages to the user. In fact, from the development of internet and its knowledge has spread all over the world, people are attracted to use it.

Online banking is created to give a lot more conveniences to the user but then the user might need more security purposes implemented by the online banking provider. This is strengthened by my survey towards 30 online banking users age 18-20 where more than 70% strongly agree with the statement below:



*Who was survey?
when?
where?*

Figure 10 – data on “bank should some better form of consumer identification or authentication for people logging into online banking”.

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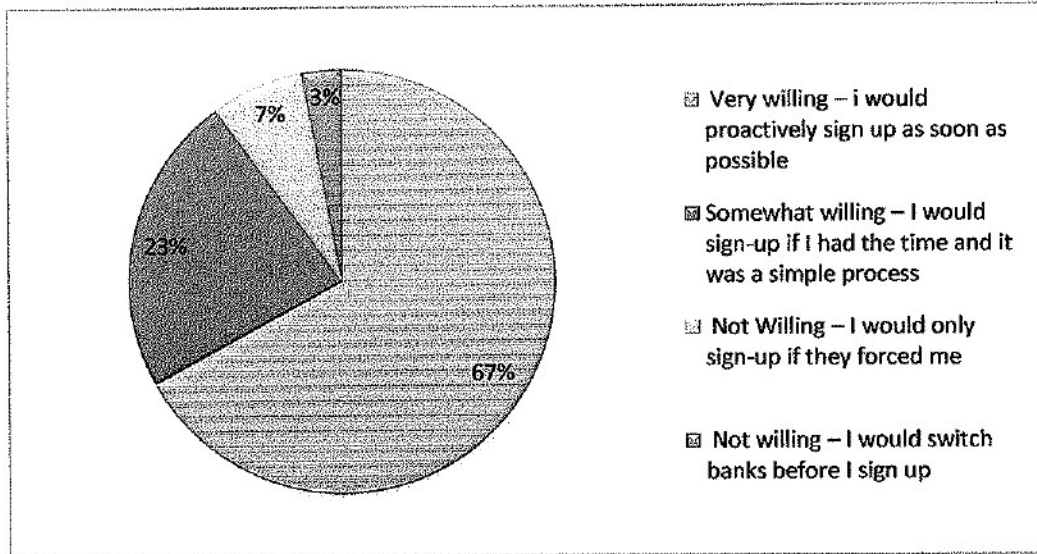


Figure 11 – Data on “How willing the user will using new authentication method beyond the standard username and password if the bank offer stronger security?”

While some user think that any fraud occurring on the online banking are the bank responsibility. More than half agree with the statement:

✓ expected.

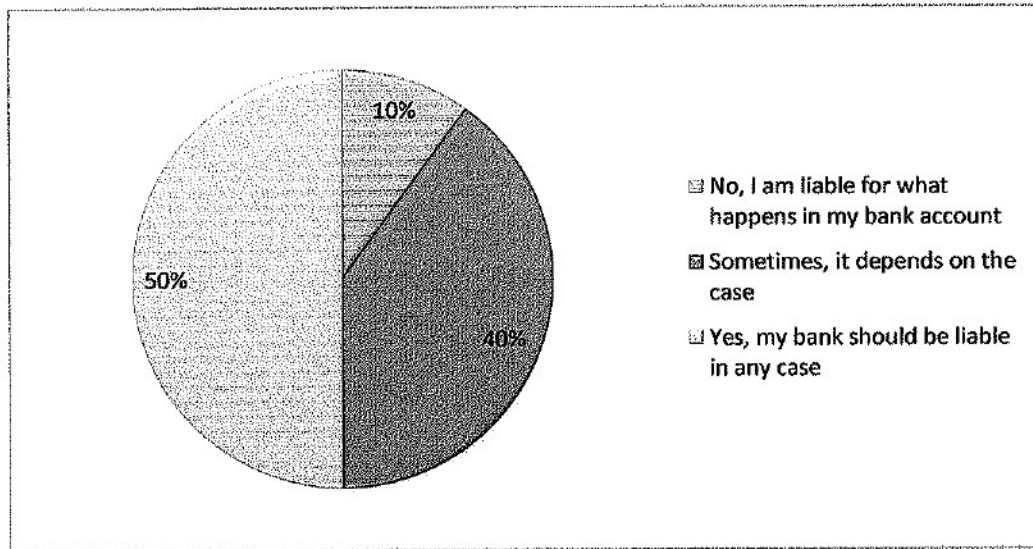


Figure 12 – Data on “Should your bank liable for fraud occurring on the online banking website?”

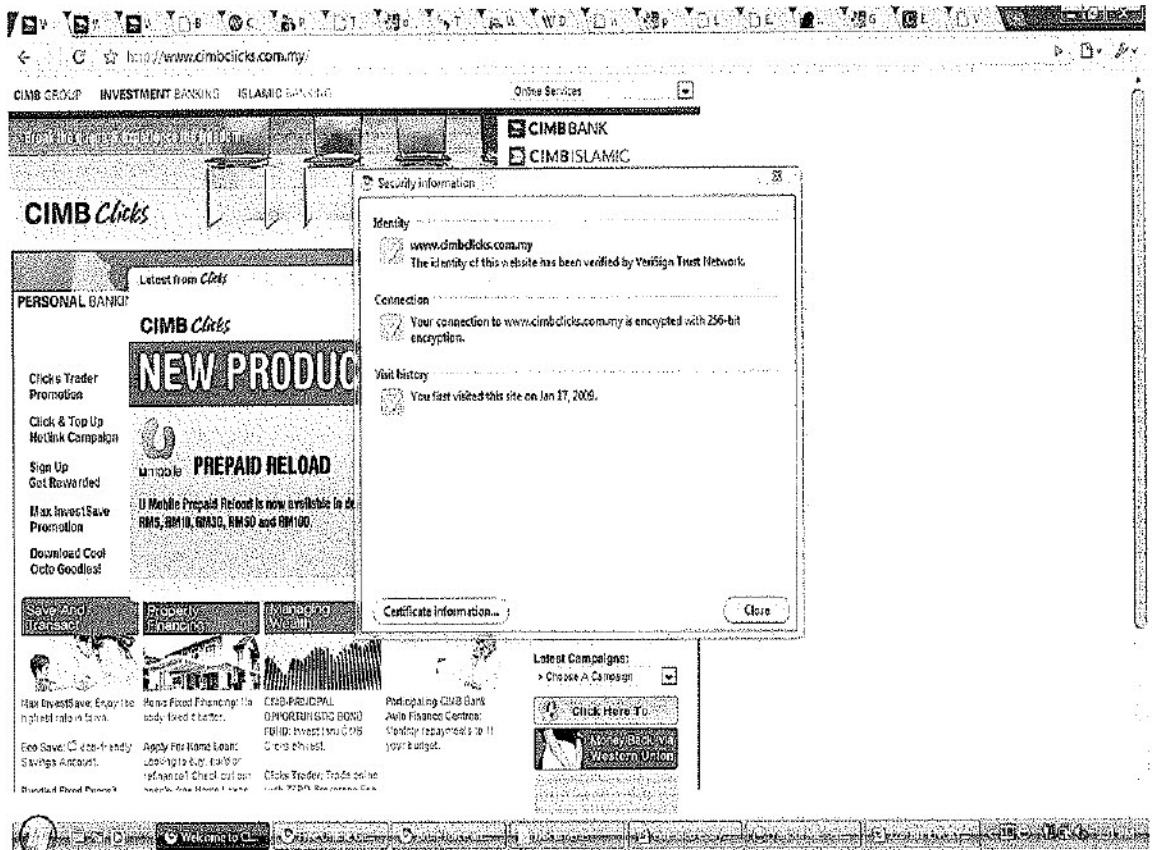
Solution for the problem arising from online banking issues

Use of technology as a part of solution

One of the best solutions to block the security attack while user is performing online banking is by using the latest encryption technology in web browser. By using web browser that support the *Advanced Encryption Standard (AES)* that enables the 256-bit encryption, most of the *Secure Socket Layer (SSL)* will works at it higher protection level. It will works by using public key for encryption and different private key for decryption. SSL will use public key to exchange the session key between the client and server of the bank; this public key is used to encrypt the http transaction for both request and response. Each of the session is using different keys, so if criminal can decrypts the public key, it doesn't mean the criminal can find online banking server private key. *source?*

A public key and private key are created simultaneously using algorithm like RSA by a Certificate authority (CA). However the private key is only given to the requesting user by the server while the public key is created publicly available as part of the digital certificate; in the directory that other user can access. On the other hand, the private key will never be shared with other users and it will not be sent to the other users on the net. Even though there is a technology like password cracker such as *brute force* which is a common way to calculate every possible key one by one, it will take much longer time to do it. So by using web browser that support the high level of encryption it is hard for the criminal to hack or intercept the messages between the user and the server (bank). Thus provides the higher level of protection while performing online banking. *source?*

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source ?

Figure 13 - Google Chrome that support the 256-bit encryption

R

Another solution for the online banking threat is the use *Transaction Authorisation Code (TAC)*. TAC is a unique, 6-digit code that will be compulsory requirement for user to do online transactions.²⁹ It only can be use with user specific username and password of the online banking. Plus it is only valid for a certain period of time such as 2 hours for CIMBclicks user. If hacker could access into the user online banking account, the criminal still need TAC in order to perform any transaction and it can only be obtain from sms that is ✓ send by the bank to user's hand phone. The hacker also can't change the user personal information like phone number if he attempt to get the TAC send to him because TAC is required as a confirmation of the personal information change.

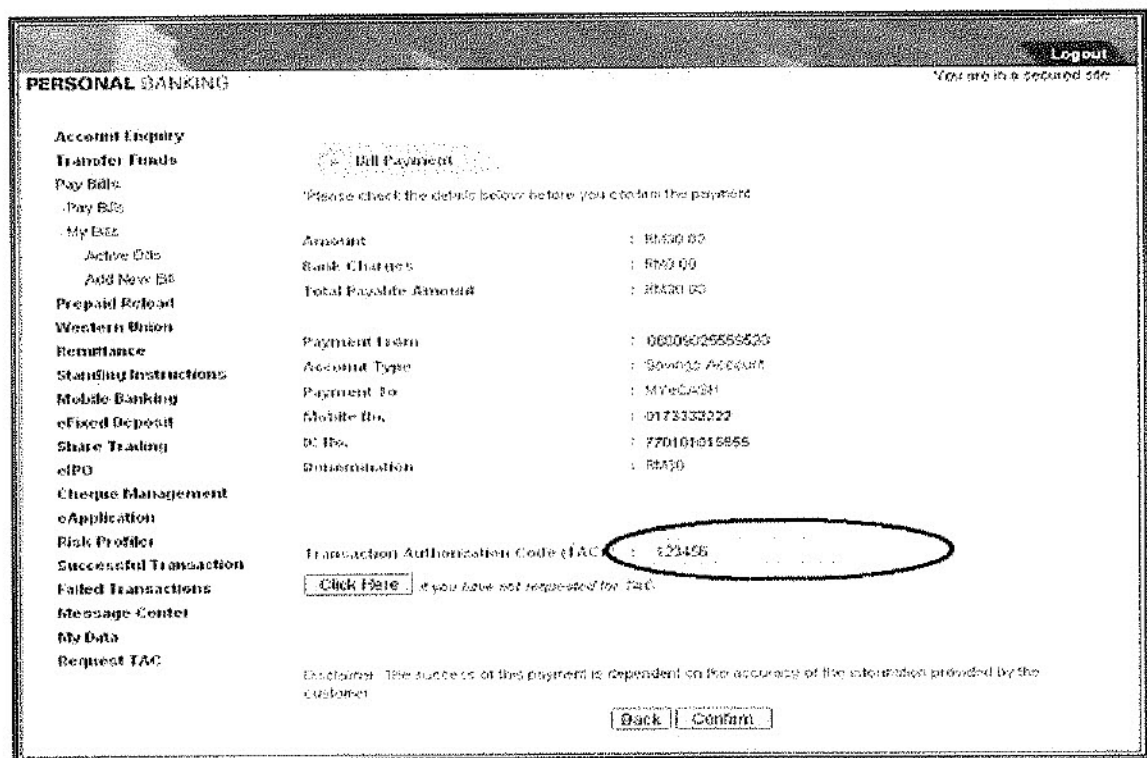


Figure 14 - TAC is required to confirm the transaction

difficult to read, source?

²⁹ Maybank2U, *what is transaction authorization code (TAC)*, 3 February 2009, Available at http://www.maybank2u.com.my/consumer/online_banking/about_tac.shtml#whatis

R

General solution

In order to keep our personal information in safe and not being exposed to the third party or even stolen by theft, it is best to keep precautionous every time user is not just while performing online banking but also while surfing the internet. Fraud, spam and any other security threat will always show up. So it is best for user be aware of 'phishing', 'pharming' or 'spoofing' and ignore to emails that ask to "verify account information and password". Despite the technology sometime can bring harm to user, user can't blame the technology that has contributed a lot in user's life. So, what user can do best is take precautions and always beware of internet threat. This is simply to avoid from being one of the online banking threat victim.

Evaluating the feasibility of the solution

By practicing the entire advices user can make sure that their personal information is at safe. How? User can simply download the latest version of the web browser that support the higher protection level of encryption and also always take precautions while online. *vague*

It is not easy to track down the cyber criminal because the methods they use are different and how will they trap the user is also unpredictable. The solution might help the user, at least far from being attack by the cyber criminals. Thus it will be harder for criminals to do cyber crime on the internet especially regarding online banking. ✓

*'pharming' and
'spoofing',
not
presented.*

Conclusion

Summary on the issue of the online banking that give impact to its user

In conclusion, online banking is an effective ways for the user to handle their bank accounts and give a lot of advantages rather than disadvantages to them.

Somehow, there are a lot of social and ethical issues derive from it. Security concern have caused user afraid to use the online banking often. Afraid of being hack while performing online banking have make them rarely use of the technology. Besides that, identity theft is another issue that make the user doubtful to use it as they afraid their personal information might be stolen by thieves. Plus, reliability of the online banking also [?] contributed to one of the major issues that increased the doubtful of the user to use the online banking service.

*not
reliability*

Despite all that, a lot of security method has been implemented by the bank such provide higher protection level of SSL in order to increase the security protection for the conveniences of the user. Besides that, user must also take full precautions about their personal information not just while they are online but also in real world. However, all the cyber criminals must be stopped because it is unethical for them to take things that do not belong to them.

*Weak
conclusion
main security issues
not addressed.*

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repeated

repeated and occurs previously

L

Appendices

Set of questionnaire sheet

ITGS – Online Banking

Questionnaire

1. The advantage and disadvantage of online banking

For this question, please answer them by circling the appropriate number according to your preference.

1 – strongly agree	2 – agree	3 – neutral	4 – not agree
--------------------	-----------	-------------	---------------

A. Advantage of online banking

Answer

	1	2	3	4
Convenient (save time)	1	2	3	4
Expedient(practical to use)	1	2	3	4
Inexpensive compare to go to the conventional bank (cost)	1	2	3	4
Convenient bill paying medium	1	2	3	4
Bank anytime day or night	1	2	3	4
Bank weekdays, weekends, even holidays	1	2	3	4
Bank from anywhere in the world (as long as you have access to the computer and internet)	1	2	3	4
Monitor your account easily	1	2	3	4
Reduce man power (clerks and bank officers)	1	2	3	4

B. Disadvantage of online banking

	1	2	3	4
Trust your bank provider	1	2	3	4
Security concerns, like 'hackers' accessing your bank accounts	1	2	3	4
Must have basic computer skills and internet knowledge	1	2	3	4
Lack of communication between user and service provider	1	2	3	4

2. Issues regarding online banking

- a. Do you feel that the bank should use some better form of consumer identification or authentication for people logging into online banking?
 - No, I feel fine simply using a user name and password
 - It doesn't matter to me either way
 - I would prefer some kind of stronger authentication
 - I strongly prefer some kind of stronger authentication
- b. How willing would you be to start using a new authentication method, beyond the standard user name and password, if your bank decided to offer stronger security?
 - Very willing – i would proactively sign up as soon as possible

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toward its user

- Somewhat willing – I would sign-up if I had the time and it was a simple process
- Not Willing – I would only sign-up if they forced me
- Not willing – I would switch banks before I sign up
- c. Should your bank be liable for fraud occurring on the Internet banking website?
 - No, I am liable for what happens in my bank account
 - Sometimes, it depends on the case
 - Yes, my bank should be liable in any case
- d. How secure do you feel using online banking?
 - Not at all secure
 - Not very secure
 - Somewhat secure
 - Very secure
- e. Have you ever heard of the term “phishing”?
 - Yes, and I know what it is
 - Yes, but I’m not sure what it is
 - No
- f. Have you ever received a phishing email?
 - Yes
 - No
 - I don’t know
- g. Have you ever knowingly responded to a phishing email and divulged information?
 - Yes
 - No
 - I don’t know
- h. Do you trust your online banking provider?
 - Yes
 - Somewhat trust
 - Not very trust
 - Not at all
- i. Have you ever heard of *Identity Theft*?
 - Yes - and I know what it is
 - Yes, but I’m not sure what it is
 - No

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3. General question

a. How often do you online banking?

- Once in a week
- More than twice a week
- Once in a month
- I do it when I need

b. Do you use online banking to perform tasks (e.g. check your balance, pay bills, etc)

- Yes
- No

c. Which one do you prefer most

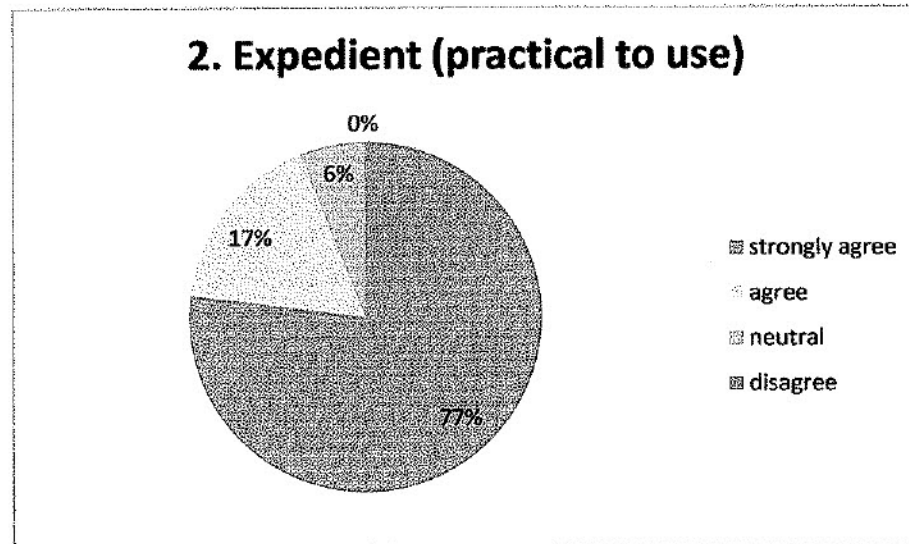
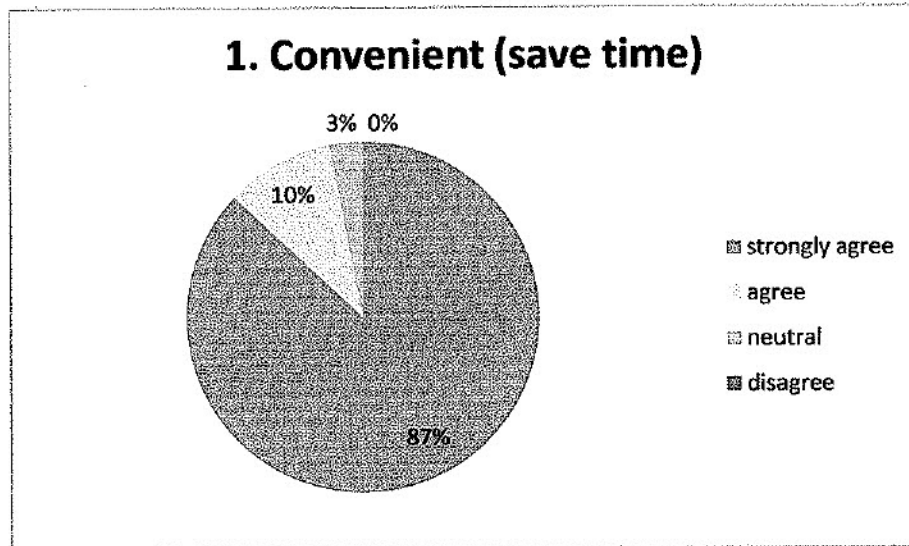
- Online banking
- Conventional banking (normal banking)

Impact of Security issues of online banking toward its user

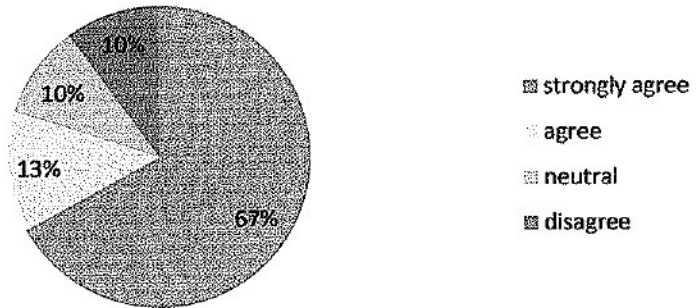
Data Analysis from survey.

Advantages

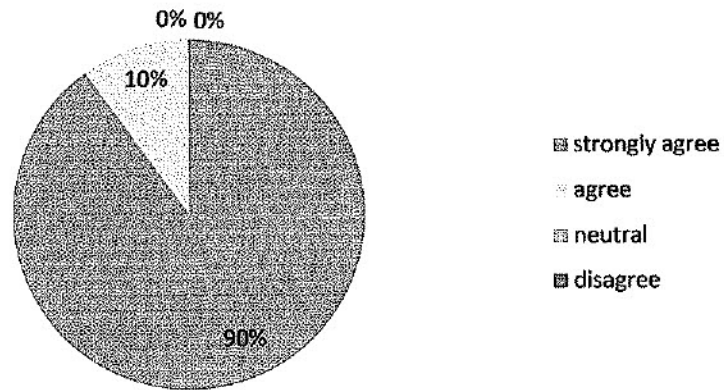
Each pie chart represents percentage of MARA College Banting to different advantage of online banking can give to them base on survey conducted.



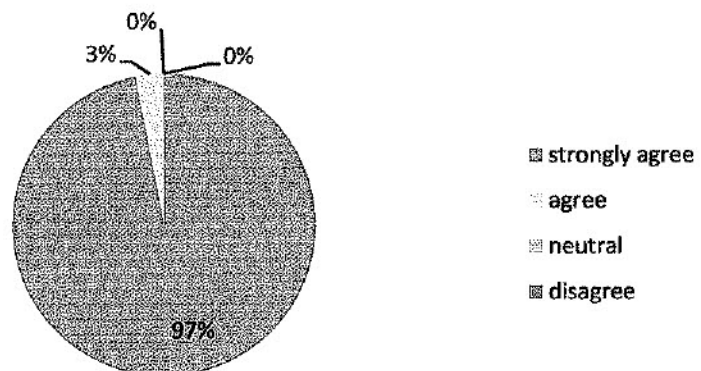
3. Inexpensive compare to conventional bank (cost)



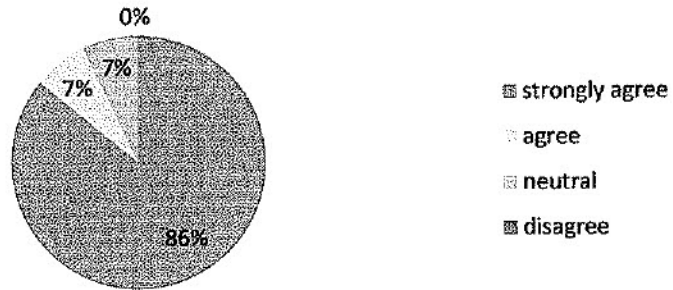
4. Convenient bill paying medium



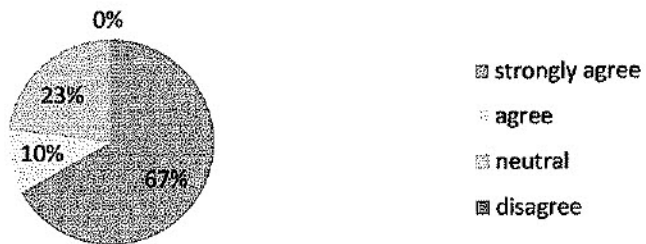
5. Bank anytime day or night



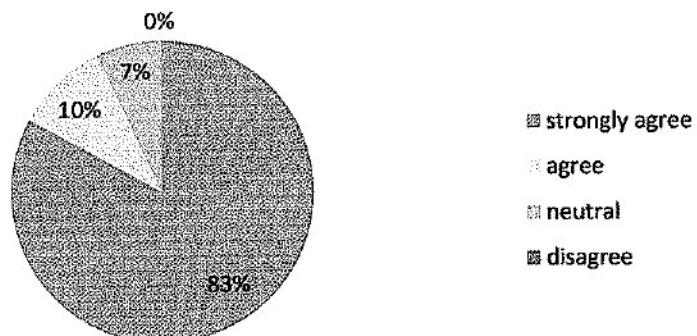
6. Bank weekdays, weekends, even holidays



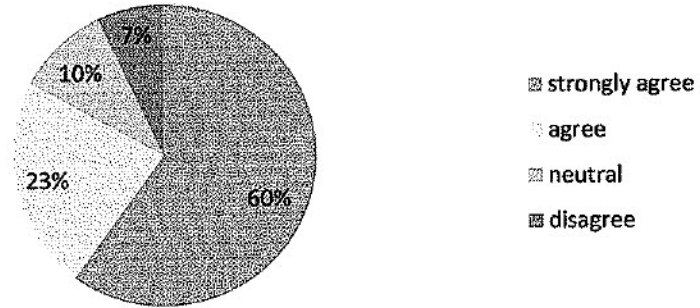
7. Bank from anywhere in the world (as long as you have access to the computer and internet)



8. Monitor your account easily



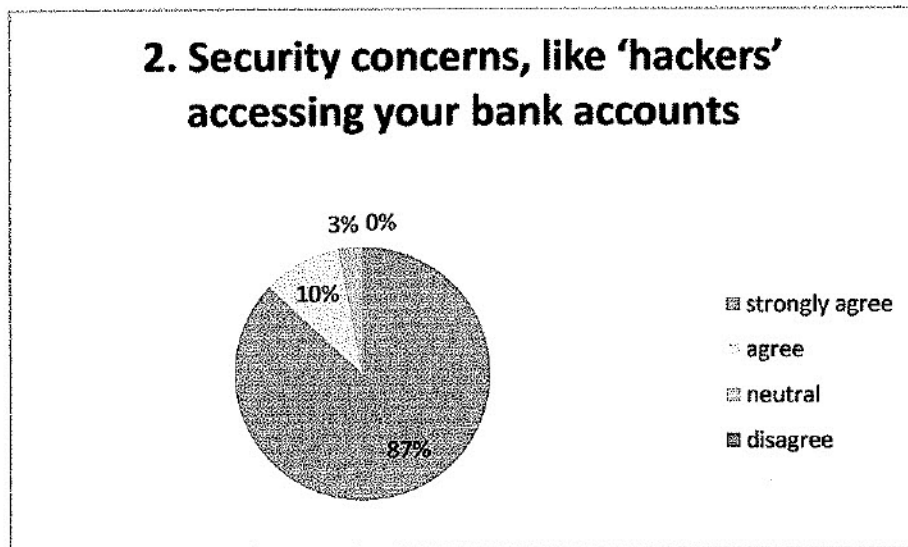
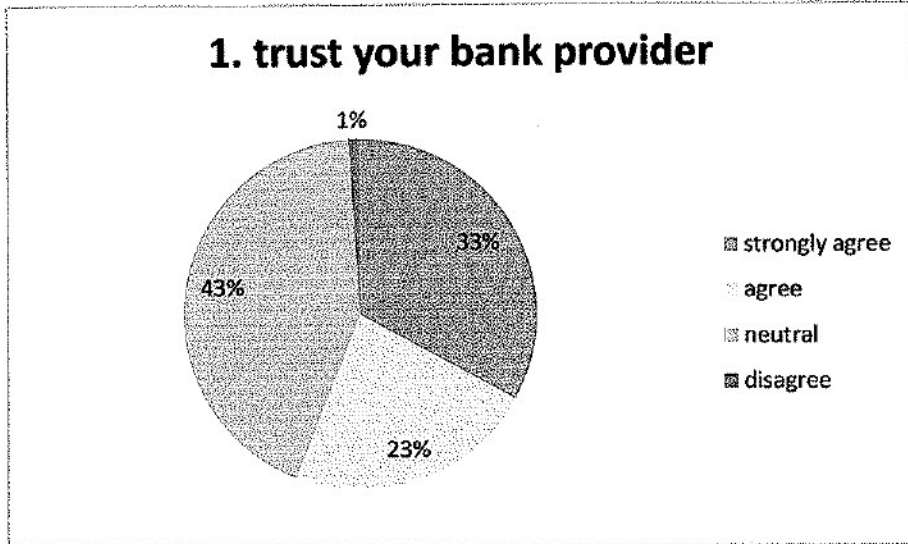
9. reduce man power (clerk and bank officer)



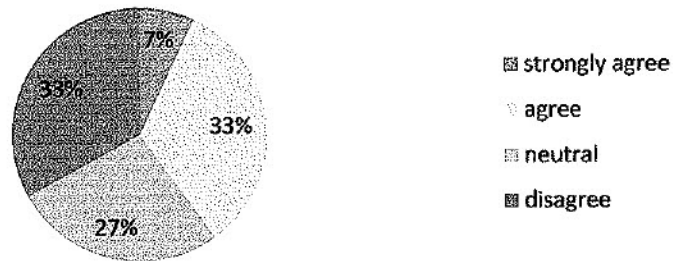
Impact of Security issues of online banking toward its user

Disadvantages

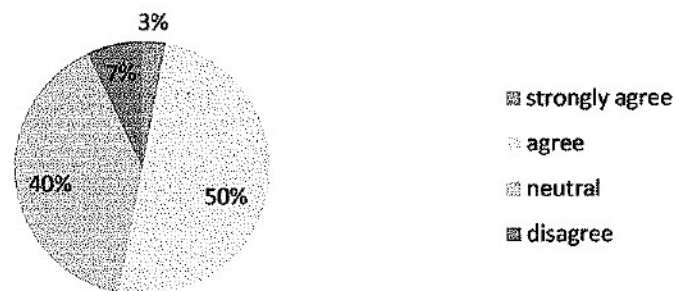
Each pie chart represents percentage of MARA College Banting to different disadvantage of online banking can give to them base on survey conducted.



3. Must have basic computer skills and internet knowledge



4. Lack of communication between user and service provider

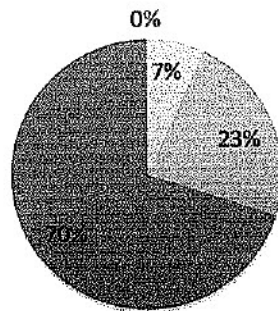


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Issues regarding online banking

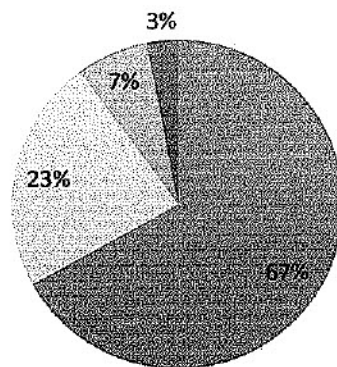
Each pie chart represents percentage of MARA College Banking to different issues of online banking can give to them base on survey conducted.

Do you feel that the bank should use some better form of consumer identification or authentication for people logging into online banking?



- No, I feel fine simply using a user name and password
- It doesn't matter to me either way
- I would prefer some kind of stronger authentication
- I strongly prefer some kind of stronger authentication

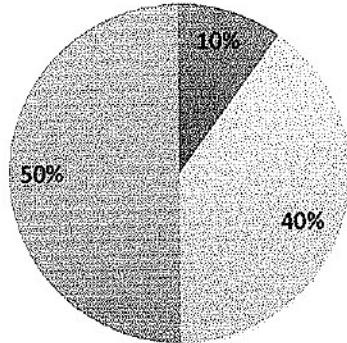
How willing would you be to start using a new authentication method, beyond the standard user name and password, if your bank decided to offer stronger security?



- Very willing – i would proactively sign up as soon as possible
- Somewhat willing – I would sign-up if I had the time and it was a simple process
- Not Willing – I would only sign-up if they forced me
- Not willing – I would switch banks before I sign up

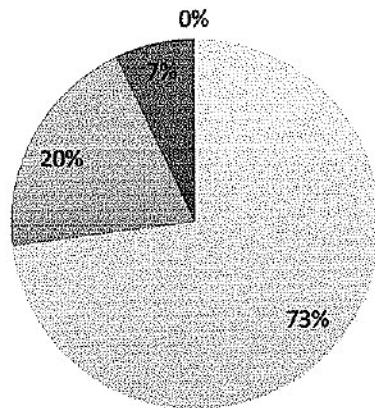
Impact of Security issues of online banking
toward its user

**Should your bank be liable for fraud occurring on the Internet
banking website?**



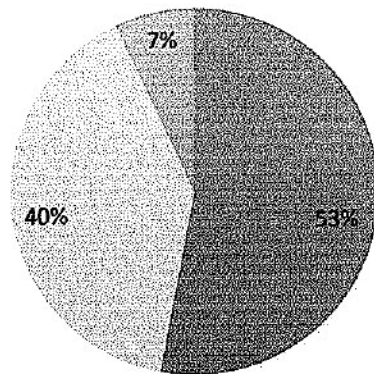
- No, I am liable for what happens in my bank account
- Sometimes, it depends on the case
- Yes, my bank should be liable in any case

How secure do you feel using online banking?



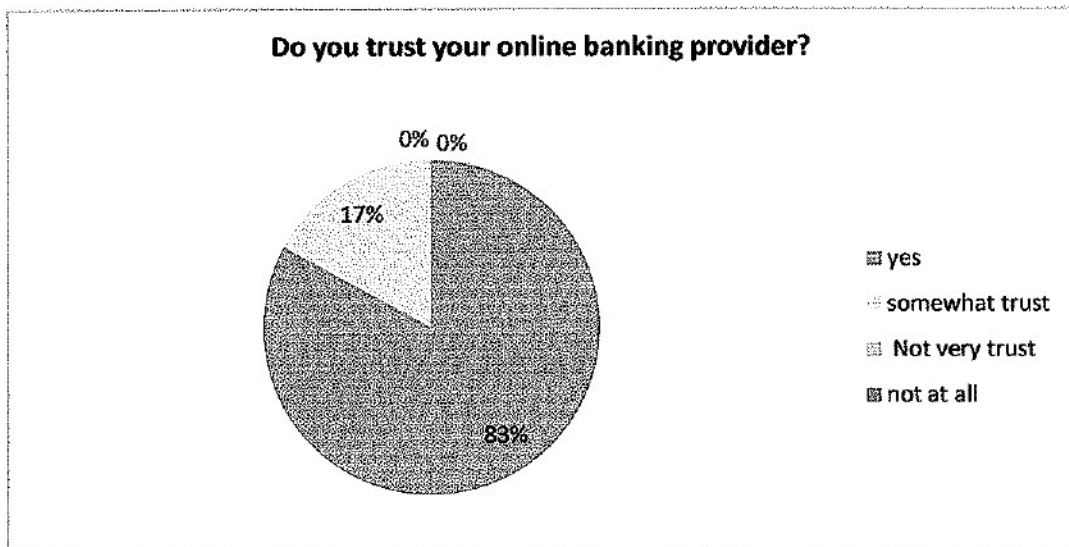
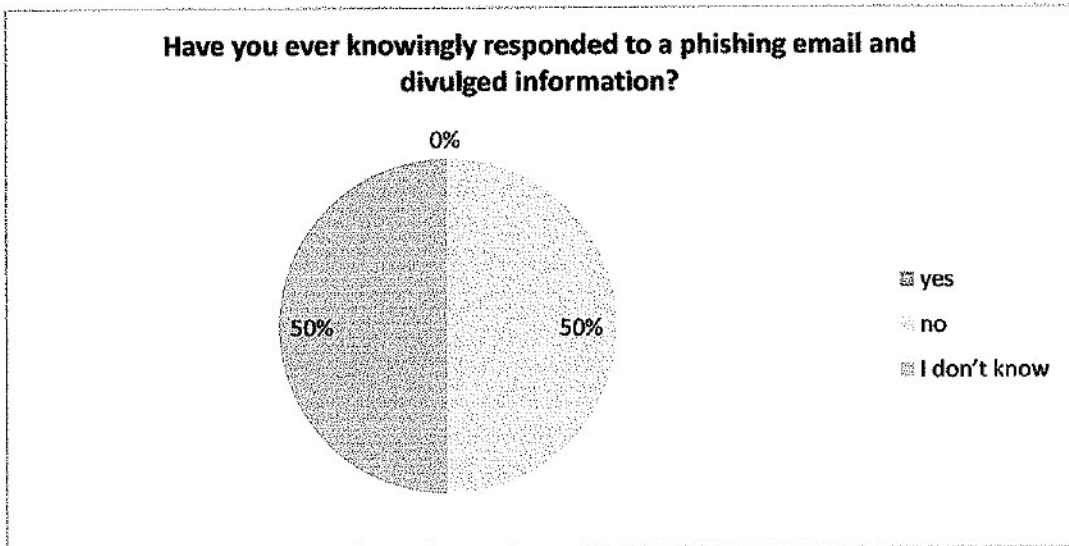
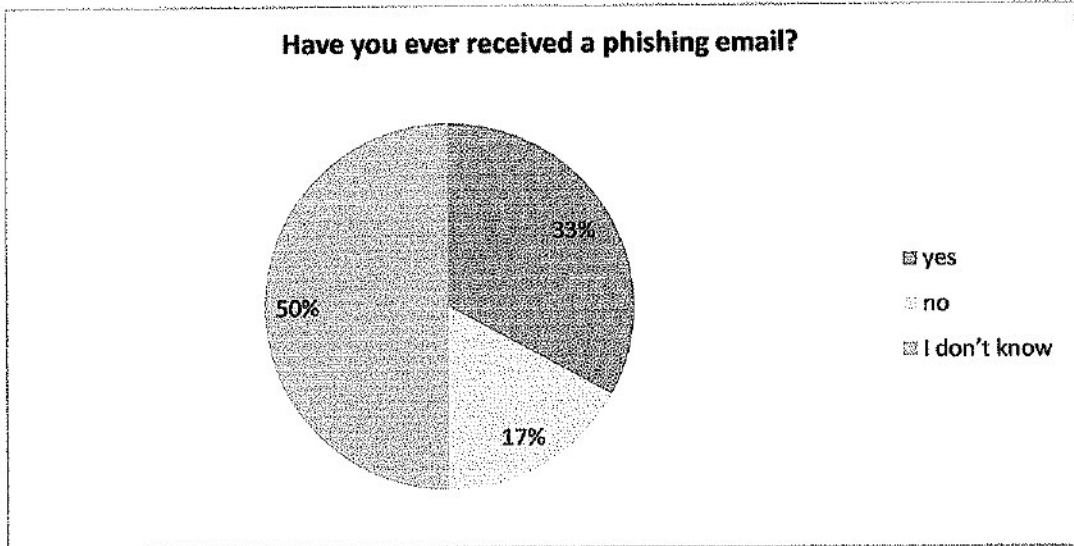
- Not at all secure
- Not very secure
- Somewhat secure
- Very secure

Have you ever heard of the term "phishing"?



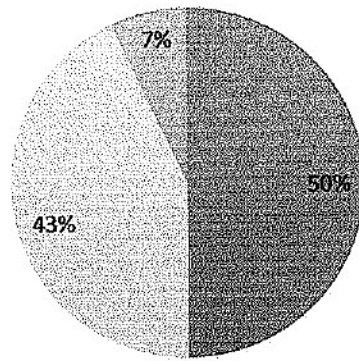
- Yes - and I know what it is
- Yes, but I'm not sure what it is
- No

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toward its user

Have you ever heard of Identity Theft?



- Yes - and I know what it is
- Yes, but I'm not sure what it is
- No

Articles



Online bank fraud concerns consumers

Account holder rights vary based on situation

By Bob Sullivan

Technology correspondent

updated 9:38 p.m. ET Dec. 14, 2004

It's the most unnerving story imaginable for a bank customer -- money disappearing from their account. A mysterious transaction, and no recourse. All the money, simply gone.

The case of Joe Lopez, detailed Tuesday by "[NBC Nightly News with Brian Williams](#)," is just one example. Lopez lost \$90,000 when an unauthorized wire transfer moved the funds from his small business account to a bank account in Latvia. As a small business account holder, Lopez has fewer rights than consumers would if facing the same situation. But the story highlights increasing concern over the way financial institutions verify just who is moving money around their systems.

Online banking is increasingly popular in the United States. This year, about 55 million people will bank online, according to analyst firm Gartner. But the system is fraught with perils.

Chief among them are phishing e-mails that trick consumers into giving away their bank login information or other personal data. Nearly 2 million consumers said they'd fallen for the trick during one 12-month period, Gartner analyst Avivah Litan said earlier this year. It's not clear how many of them suffered an eventual attack on their online bank accounts, Litan said, but the stolen information is clearly valuable to would-be criminals.

While consumers who do suffer account losses are often refunded the money, there's still paperwork headaches to deal with, and not everyone does recover everything they've lost.

"In most cases, especially those involving credit card fraud, consumers get their money back pretty easily," she said. "But in other cases, like new account fraud or illegal transfers, it's not so simple and consumers often can lose out. They need to be aware of the holes in the system that are more apparent than ever with all the electronic doors into and out of their bank accounts."

Banks take action

Banks are trying to react to the problem. Citibank recently reduced the amount of money it allows customers to transfer out of checking accounts in response to the phishing epidemic.

*articles are misplaced;
in the middle of survey
questions and responses*

Impact of Security issues of online banking
toward its user

Daily limits on the institution's Global Transfers program, which allows customers to move money to any Citibank account for \$5 or \$10 per transfer, were reduced to \$500 per day and \$1,000 per week in October.

"In the current environment, where there is a lot of phishing and potential fraud, we took preventative security measures by reducing the amount that can be sent," said Citibank spokesman Mark Rodgers. "We hope to up those limits again soon. We have been adding security enhancements to the service."

Still, consumers are worried. A study published last month by InsightExpress reveals two out of five consumers are more concerned about online banking fraud this year versus last year. And in the most recently-available statistics from the Federal Trade Commission, 17 percent of identity theft complaints involved bank account thefts.

"The consumer feels like ... they are exposed to that risk," said Lee Smith, president and COO of InsightExpress.

Know your rights

In general, consumers draw little distinction between credit card fraud and online bank account theft, Smith said. But while consumers might not, federal law does, and so it's important that account holders understand the distinctions.

Rules governing credit card fraud are clear. Consumers are only liable for the first \$50 charged in their name by a thief, and most banks waive that responsibility.

Rules governing electronic fraud are more complex. According to the Federal Reserve's Regulation E, consumers must report a electronic funds transfer problem within two days to insulate themselves from liability, and even then are still on the hook for \$50. Consumers who report a problem within 60 days have their liability capped at \$500.

But after that, there are no federally-mandated consumer protections. Consumers may end up losing all their money. Legally, victims in this situation are on very shaky footing when they try to fight their bank.

The other problem with money that's been stolen directly from a checking account, said Linda Foley, director of the Identity Theft Resource Center, is that it's already gone — a very different situation than a credit card takeover, where consumers can simply refuse to pay the bill. "There's always an immediacy issue when your money has been drained from your checking account," she said.

Lopez actually reported his theft right away, but as a small business owner with a corporate account, the transaction was not governed by Regulation E, which only protects consumers. So when Bank of America determined the problem was faulty security on his end, it decided not to refund his money.

Thanks to the widespread protection afforded consumers, they shouldn't be reluctant to bank online, said James Van Dyke, founder and principal analyst of Javelin Strategy and Research.

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"People are more worried than they used to be, and that makes sense," he said. "There are threats out there which have come into popular use. But there are some very logical things people can do which really do protect themselves."

Not divulging personal information through e-mail is one, he said. Another successful tactic is to use the Internet to regularly monitor online banking accounts for signs of fraud. The quicker a fraud is discovered, the easier it is to fix, Van Dyke said.

At a 'tipping point'

Still, Howard Schmidt, former White House cybersecurity advisor and co-author of the National Strategy to Defend Cyberspace, said stories like these only highlight the need for dramatic new ways to positively identify consumers and institutions when they are online.

"This is a growing problem," he said. "We're reaching a tipping point."

Schmidt favors what's called "two-factor" authentication. Banks should issue consumers smart cards with electronic chips that they can insert into their computer before banking online, he said. Then, they'll also have to supply a password before performing transactions.

"It's something you have, and something you know," Schmidt said. "Even if I had a keylogger and had stolen your password, without a smart card ... you can't do anything. That's why it's so effective."

Recently, America Online began offering consumers the opportunity to log on using an external device, in one of the first major two-factor authentication efforts. But despite the need, Schmidt said it will be a long time before such a system is mandatory at banks and other financial institution Web sites.

"There's been a lot of discussion (with banks), but it requires a tremendous infrastructure change," he said.

So for now, as some consumers are finding out the hard way, only a username and password stands between criminals and their hard-earned money.

Bob Sullivan is the author of [Your Evil Twin: Behind the Identity Theft Epidemic](#)

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Hacking fears bog down online banking growth

By [Dinesh C. Sharma](#), Special to ZDNet Asia

07/09/2005

URL: <http://www.zdnetasia.com/news/internet/0,39044908,39252935,00.htm>

The number of people who turn to the Internet for personal banking isn't growing--but those who are already hooked on such services are using them more often, a new survey has shown.

The percentage of Americans who conduct personal banking activities online has stagnated at 39 percent in the 12-month period ending August 2005, Ipsos Insight said in a study released Tuesday.

The research firm, which interviewed 1,000 American adults for the study, found that many consumers were worried that their personal information could either be stolen by hackers and phishers or sold to third parties by banks. Nearly 83 percent of those who conduct banking online reported such concerns, while 73 percent of respondents said personal information theft is a deterrent for them.

"The industry needs to convey that they are, in fact, addressing the fundamental issues of personal information protection and theft associated with online banking, because the public's misperception is what's deterring growth," Doug Cottings, senior vice president at Ipsos Insight, said in a statement.

But those hooked on net banking are carrying out more transactions such as paying bills or managing mutual funds and retirement funds, the study found. Also, more people are signing up for new financial and banking services online. Half of all new credit card applications were made online, and about 50 percent of mortgages, home equity loans and car loans were signed up for online, the study said.

"There are specific ways companies can make online banking a better experience, beginning with assuring customers that their information won't be sold to third parties," Cottings said.

ITGS – Online Banking

Questionnaire

1. The advantage and disadvantage of online banking

For this question, please answer them by circling the appropriate number according to your preference.

1 – strongly agree	2 – agree	3 – neutral	4 – not agree
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A. Advantage of online banking

Answer

Convenient (save time)	①	2	3	4
Expedient(practical to use)	①	2	3	4
Inexpensive compare to go to the conventional bank (cost)	①	2	3	4
Convenient bill paying medium	①	2	3	4
Bank anytime day or night	1	②	3	4
Bank weekdays, weekends, even holidays	1	2	③	4
Bank from anywhere in the world (as long as you have access to the computer and internet)	①	2	3	4
Monitor your account easily	①	2	3	4
Reduce man power (clerks and bank officers)	①	2	3	4

B. Disadvantage of online banking

Trust your bank provider	1	②	3	4
Security concerns, like 'hackers' accessing your bank accounts	①	2	3	4
Must have basic computer skills and internet knowledge	1	②	3	4
Lack of communication between user and service provider	①	2	3	4

2. Issues regarding online banking

a. Do you feel that the bank should use some better form of consumer identification or authentication for people logging into online banking?

- No, I feel fine simply using a user name and password
- It doesn't matter to me either way
- I would prefer some kind of stronger authentication
- I strongly prefer some kind of stronger authentication

b. How willing would you be to start using a new authentication method, beyond the standard user name and password, if your bank decided to offer stronger security?

- Very willing – i would proactively sign up as soon as possible
- Somewhat willing – I would sign-up if I had the time and it was a simple process
- Not Willing – I would only sign-up if they forced me
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- c. Should your bank be liable for fraud occurring on the Internet banking website?
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- d. How secure do you feel using online banking?
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- e. Have you ever heard of the term "phishing"?
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- f. Have you ever received a phishing email?
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ITGS – Online Banking

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1 – strongly agree	2 – agree	3 – neutral	4 – not agree
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Bank anytime day or night	①	2	3	4
Bank weekdays, weekends, even holidays	①	2	3	4
Bank from anywhere in the world (as long as you have access to the computer and internet)	①	2	3	4
Monitor your account easily	①	2	3	4
Reduce man power (clerks and bank officers)	①	2	3	4

B. Disadvantage of online banking

Trust your bank provider	1	②	3	4
Security concerns, like 'hackers' accessing your bank accounts	①	2	3	4
Must have basic computer skills and internet knowledge	1	②	3	4
Lack of communication between user and service provider	1	②	3	4

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B. Disadvantage of online banking

Trust your bank provider	1	2	3	④
Security concerns, like 'hackers' accessing your bank accounts	①	2	3	4
Must have basic computer skills and internet knowledge	1	2	3	④
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Bank anytime day or night	①	2	3	4
Bank weekdays, weekends, even holidays	1	②	3	4
Bank from anywhere in the world (as long as you have access to the computer and internet)	①	2	3	4
Monitor your account easily	①	2	3	4
Reduce man power (clerks and bank officers)	1	②	3	4

B. Disadvantage of online banking

Trust your bank provider	①	2	3	4
Security concerns, like 'hackers' accessing your bank accounts	①	2	3	4
Must have basic computer skills and internet knowledge	①	2	3	4
Lack of communication between user and service provider	①	2	3	4

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a. How often do you online banking?

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- Online banking
- Conventional banking (normal banking)

ITGS – Online Banking

Questionnaire

1. The advantage and disadvantage of online banking

For this question, please answer them by circling the appropriate number according to your preference.

1 – strongly agree	2 – agree	3 – neutral	4 – not agree
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A. Advantage of online banking

Answer

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- Yes - and I know what it is
- Yes, but I'm not sure what it is
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- Yes
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c. Which one do you prefer most

- Online banking
- Conventional banking (normal banking)

ITGS – Online Banking

Questionnaire

1. The advantage and disadvantage of online banking

For this question, please answer them by circling the appropriate number according to your preference.

1 – strongly agree	2 – agree	3 – neutral	4 – not agree
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A. Advantage of online banking

Answer

Convenient (save time)	①	2	3	4
Expedient(practical to use)	①	2	3	4
Inexpensive compare to go to the conventional bank (cost)	①	2	3	4
Convenient bill paying medium	①	2	3	4
Bank anytime day or night	①	2	3	4
Bank weekdays, weekends, even holidays	①	2	3	4
Bank from anywhere in the world (as long as you have access to the computer and internet)	①	2	3	4
Monitor your account easily	①	2	3	4
Reduce man power (clerks and bank officers)	①	2	3	4

B. Disadvantage of online banking

Trust your bank provider	1	②	3	4
Security concerns, like 'hackers' accessing your bank accounts	①	2	3	4
Must have basic computer skills and internet knowledge	1	2	③	4
Lack of communication between user and service provider	1	②	3	4

2. Issues regarding online banking

a. Do you feel that the bank should use some better form of consumer identification or authentication for people logging into online banking?

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d. How secure do you feel using online banking?

- Not at all secure
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e. Have you ever heard of the term "phishing"?

- Yes, and I know what it is
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- No

f. Have you ever received a phishing email?

- Yes
- No
- I don't know

g. Have you ever knowingly responded to a phishing email and divulged information?

- Yes
- No
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ITGS – Online Banking

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Assessment form (for examiner use only)

Candidate session number	0	0	
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Assessment criteria		Achievement level		
		First examiner	maximum	Second examiner
A	research question	1 ✓	2	<input type="checkbox"/>
B	introduction	1 ✓	2	<input type="checkbox"/>
C	investigation	3 ✓	4	<input type="checkbox"/>
D	knowledge and understanding	3 ✓	4	<input type="checkbox"/>
E	reasoned argument	3 ✓	4	<input type="checkbox"/>
F	analysis and evaluation	3 ✓	4	<input type="checkbox"/>
G	use of subject language	3 ✓	4	<input type="checkbox"/>
H	conclusion	1 ✓	2	<input type="checkbox"/>
I	formal presentation	3 ✓	4	<input type="checkbox"/>
J	abstract	1 ✓	2	<input type="checkbox"/>
K	holistic judgment	4 ✓	4	<input type="checkbox"/>
Total out of 36		26 ✓		<input type="checkbox"/>

Name of first examiner: _____
(CAPITAL letters)

Examiner number: _____

Name of second examiner: _____
(CAPITAL letters)

Examiner number: _____