

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Banks are defined as a financial institution that accept deposits and make loans (Mishkin, 2000). For bankers, the principal raw material is money. Banks are engaged in buying and selling money. That is how banks do business or make profit. Included under the term “banks” are commercial banks, savings and loan associations, mutual savings banks and credit unions. Banks are among the most important financial institutions in the economy. Banks are the most important source of credit for individuals, corporations and governments. Financial markets are thus essential to promote economic efficiency as they perform the economic function of channeling funds from people who have saved surplus funds to those who have shortage of funds.

2.2 Banking Management

The success of banks does not only depend on the profit but also on their ability in identifying the financial services needed by the public. Modern banks are adopting new functions in order to remain competitive and responsive to public needs.

2.2.1 The Functions of Modern Banks

According to Rose (1999), there are five important services or functions played by modern banks as shown in Table 2.1.

Table 2.1
The Roles of Modern Banks

Types of Services	Explanation
The Intermediation Service	Receive deposit from customers and provide loan for business firms and individuals.
The Payments Service	Carrying out payment for goods and services on behalf of their customers.
The Guarantors Service	To stand behind their customers to pay off customer debts when those customers are unable to pay.
The Agency Service	Acting on behalf of customers to manage and protect their property or issue and redeem their securities.
The Policy Service	Serving as a conduit for government policy in attempting to regulate their growth of the economy and pursue social goals.

The vital services performed by Full Service Banking Institution today are (Rose, 1999):

1. The credit function
2. The investment and planning function
3. The payments function
4. The savings function
5. The cash management function
6. The investment banking function
7. The brokerage function
8. The trust function
9. The insurance function

Banks play a major role in channeling funds to borrower with productive investment opportunities. They are also important to ensure that the financial system and the economy run smoothly and efficiently. The basic operation and management of a bank are analyzed through a bank's balance sheet. The balance sheet is a list of the bank's assets and liabilities. Liabilities are defined as the source of fund for a bank to create businesses. Without liabilities, banks will not be able to operate. Funds are obtained through borrowing and by issuing other liabilities such as deposits. There are four important types of liabilities acquired by a bank, as listed below:

1. Checkable Deposits
2. Non Transaction Deposits
3. Borrowings

4. Bank Capital

1. Checkable Deposits

Checkable deposits are bank accounts that allow owners of the bank accounts to write checks to third parties. Checkable deposits are the most important source of bank funds but with the appearance of new attractive financial instruments, the share of checkable deposits in total bank liabilities has shrunk over time (Mishkin, 2000).

2. Non Transaction Deposits

For the non-transaction deposits, the interest rates are higher than the checking deposits. There are two types of non transaction deposits, which are Savings Account and Certificates of Deposit.

The savings account can be added or withdrawn at any time, as there is no specific time limit or stringent rules. In Malaysia, Certificates of Deposit or CDs have a fixed maturity length ranging from several months to five years.

3. Borrowings

Banks obtain funds by borrowing from the Central Bank Federal Reserve System or FED, other banks and corporations. For Malaysian banks, the borrowing is done from the Central Bank of Malaysia.

Borrowings have become a more important source of funds for the banks compared to the earlier stage. In 1960, they made up only

around 2% of bank liabilities in the USA but currently they are exceeding 25% of the total liabilities (Mishkin, 2000).

4. Bank Capital

Bank capital is defined as the bank's net worth, which equals the difference between total assets and total liabilities. In balance sheet, the bank capital is also called "Equity". The funds are raised by selling new equity (stocks) or from retained earnings.

Banks will use the funds acquired by issuing liabilities to purchase income-earning assets. Bank assets are referred to as use of funds. The interest earned on them enables banks to make profit. Four important components need to be analyzed in terms of assets as shown below.

1. Reserves

Reserves are the deposits and other funds being hold by a bank as a cash item. According to the government regulations, some reserves will be held by the Central Bank of Malaysia, which is called Required Reserve Ratio. The balance will be held by the bank as vault cash or as Excess Reserve. For every dollar that has been deposited in the bank, a certain fraction will be kept in the Central Bank fund while others will be kept by the bank.

2. Cash Items in Process of Collection

These are the checks written from other banks that need to be deposited. The checks are classified as the cash items that need to be collected from the other banks.

3. Deposits at other Banks

Most of the small banks hold deposits in other larger banks in exchange for a variety of services, which cannot be done in the small banks such as, check collection, foreign exchange transactions and securities purchase. This collaboration is called as “Correspondent Banking”.

4. Securities

Banks use their source of funds to buy securities offered by government agencies and private business firms. In the modern banking system of the USA, the securities holdings make up 22% of the total bank assets (Mishkin, 2000).

5. Loans

All the banks make profits primarily by issuing loans. According to the current findings, some 66% of bank assets are in the form of loans (Mishkin, 2000). According to Mishkin, in recent years they have generated more than half of the bank revenues. The three types of loans being offered in commercial banks are Real Estate loans, Industrial loans and Consumer loans.

6. Other Assets

The other assets are defined as the physical capital or fixed assets such as bank buildings, computers and other equipments owned by the bank. Banks make profit by selling liabilities and buying profitable assets. This process is called Asset Transformation. If the banks produce desirable services at low cost, it could earn good income on its asset and is able to forecast for a profitable year, but if the bank is not able to manage the Asset transformation well, the bank will go bankrupt.

2.2.2 The Principles of Banking Management

The main principle on banking management is to manage its assets and liabilities to earn high profit. There are four primary concerns in managing the balance sheet (Mishkin, 2000).

2.2.2.1 Liquidity Management

Bank need to have enough cash to pay the depositors even though the deposits are lost. Liquidity management is very important in making sure that the bank is not out of cash when there are deposits outflow.

Usually banks should make sure that they have ample reserves, so that whenever there is a deposit outflow they will be able to sustain the instability caused by the outflow through the excess reserves. Alternatively, if banks do not have enough reserve,

they need to sell of the securities to earn quick money. Sometimes, when the bank does not have excess reserve at all, they have to search for a costly solution such as borrowing from Central Banks, other banks or corporations.

Excess reserves are insurance against the costs associated with deposit outflows. The higher the costs associated with deposit outflows, the more excess reserve banks will want to hold (Mishkin, 2000).

2.2.2.2 Asset Management

Banks maximize their profit by making highest return loan and securities. This is done by reducing the risk associated in selling the liabilities and to make sure that the banks holds enough liquid assets. Banks should be able to purchase securities with high returns and low risk. Banks will also lose if they hold too much reserve as there is no interest paid for the reserve.

2.2.2.3 Liability Management

Liability depends on checkable deposits. However, since checkable deposits do not provide interest, banks are unable to attract customers according to their strategies and advertisement.

The new flexibility in liability management means that banks could take a different approach in liability management since they are not dependent on checkable deposits as the primary source of bank funds. Instead, they set target goals for their asset growth and try to acquire funds as needed.

2.2.2.4 Capital Adequacy Management

Banks need to make decision on the amount of capital that they need to hold, as this will prevent them from bankruptcy or the failure to pay the depositors and creditors. Secondly the amount of capital affects returns for the owners of the bank. Thirdly a minimum amount of bank capital (bank capital requirement) is required by regulating authorities.

The amount of bank capital affects returns to equity holders. The owners of the bank need to measure the performance of the bank through bank profitability. This is done through Return on Assets (ROA), which can be calculated as below:

$$\text{ROA} = \frac{\text{Net profit after taxes}}{\text{Assets}}$$

This formula will be able to show the profits gained from each dollar of the asset.

However, the bank owners (Equity holders) also need to know the amount that they have earned through their equity investment. This measurement is done using Return on Equity (ROE), which is calculated as below:

$$\text{ROE} = \frac{\text{Net profits after taxes}}{\text{Equity Capital}}$$

There is a direct relationship between ROA and ROE, which is determined by Equity Multiplier (EM), the amount of assets per dollar of equity capital.

$$\text{EM} = \frac{\text{Asset}}{\text{Equity Capital}}$$

Given the return on assets, the lower the bank capital, the higher the return for the owners of the bank.

Usually the government will impose certain regulations on banks. This is because banks are an important element to ensure that the economy runs smoothly and efficiently. This is because banks receive deposits from the public and sell the deposits to others as a loan. The government needs to make sure that the public's money are not at risk as well as to safeguard the interest rate for the savings and loan. The government also needs to control the supply of money and credit in order to achieve a nation's broad economic goals and to ensure equal

opportunity and fairness in the public's access to credit and other vital financial services.

In Malaysia there are both local banks and foreign banks which compete with each other. The banks can be categorized as small, medium and large size banks. In Malaysia, the government is encouraging the banks to merge to compete with the foreign banks (Krishnan, 1997). This is important as Malaysia will be liberalizing its financial services industry in the near future (Said, 1999). According to government regulations, none of the foreign banks fall under the large bank category but the foreign banks would be able to bring in new resources and technologies from their headquarters in other countries to gain competitive advantage in Malaysia. This will affect the local banks as they are not as large as the foreign banks and will lose their competitiveness to the international banks. That is why the foreign banks activities are limited in Malaysia and they have very few branches in Malaysia (Samad, 1994).

However, the regulation must be balanced and limited so that banks can develop new services that the public demands, competition in financial service remains strong enough to ensure reasonable prices and an adequate quantity and quality of services to the public and to avoid any discriminations (Rose, 1999).

2.3 Malaysian Banking Development

The revolution in information and communication technologies has transformed the banking and financial service industry in Malaysia. The Malaysian financial institutions have found new channels in delivering their services through major technological breakthrough.

Customers are exposed to a number of technological based delivery services. This evolution has currently reached the stage of Internet banking or online banking in most countries and virtual banking in some developed nations. In order to be competitive with international banks, Malaysian Banks also have initiated several new technology based services for the customers. This is in line with the government's initiative in promoting and implementing information technology based system, which is very helpful in banking management.

According to Forester Research cited in Deloitte Research (2000), there are 400 million online consumers in the year 2000 compared to 100 million online consumers in the year 1999. This statistic shows a major increase in the use of the internet between one year. Through the research they have found that the number of household using online banking services will increase by 500%. In Malaysia itself, Internet users are 27% of the total population in the year 2000 (Turner, 2001). According to Turner, the number of Malaysians going online is still small compared to other nations but Malaysia is certainly not lagging behind. Furthermore, Malaysian financial industry will open the door to foreign banks by 2005. Therefore, Malaysian banks must fully utilize the

technology in order to compete with the giant banks from Japan, the USA and the United Kingdom.

2.3.1 Automated Teller Machine (ATM)

The Malaysian Financial Institutions has gone through a tremendous change and the first step was the deregulation of the financial sector and computerization of financial institutions in the 1970's (Phang, 1985). The computerization of the whole financial system was done because of an increase in the processing volume of customer's data and extra services introduced by the banks. Then in early 1980's, automated teller machines (ATM) were introduced. The ATMs play a major part in developing quality based customer service for Malaysia banking system. The ATMs carry out simple transactions such as depositing and withdrawing money. At the same time, it released the banks from constraints of time and geographical location. The customers are able to use the system beyond office hours, which is a great relief for the customers from queuing up in the banks during working hours to withdraw money.

Today, the ATMs are being used for multiple purposes such as balance inquiry, cash withdrawal, transfer of funds between checking, savings and credit card accounts, bill payments, making payments to applications for initial public offerings in Kuala Lumpur Stock Exchange (KLSE), making cash and check deposit.

According to Balachandran and Krishnan Guru (2000), customers are not confident of making cash deposits via ATM machine as the cash will only be credited to the customer's account on the following working day. BSN Commercial Bank, Maybank, Philioo Allied Bank, Hong Kong & Shanghai Bank and Standard Chartered Bank introduced Cash Deposit Machines (CDM). The CDMs accept cash immediately, verified, and credited to the customer's account.

Table 2.2
The Growth of ATM Machines in Malaysia

Year	Number of ATMs	% of growth
1985	278	22.0
1986	330	18.8
1987	609	84.5
1988	868	42.5
1989	1027	18.3
1990	1202	17.1
1991	1335	11.1
1992	1439	7.8
1993	1558	8.3
1994	1975	26.8
1995	2230	12.9
1996	2326	4.3
1997	2528	8.7

(Source: The Star, Business Section, August 6, 2001)

Table 2.2, continued

Year	Number of ATMs	% of growth
1998	2647	4.7
1999	3317	25.3
2000	3004	-9.4
2001	3379	12.5

Table 2.2 shows the increase in the growth of ATM machines in Malaysia from 1985 to 2001. Furthermore, Malaysian banks grouped together and set up a consortium called Malaysian Electronic Payment System or MEPS in 1986. The advantage of this consortium is that any customers from any banks will be able to withdraw money from any other bank's ATM machine as long as the bank is registered with the consortium (Suganthi, et. al, 2001).

In the future, it is predicted that ATMs will evolve into virtual branches providing a broader range of remote transactions where customers could interact with bank personnel through video conferencing (Phang, 1995).

2.3.2 Telebanking

Telebanking can be defined as delivery of branch services via telecommunication devices whereby bank customers can perform retail banking transactions by dialing a touch-tone telephone or mobile communication unit which is connected to an automated system of the bank that utilizes Automated Voice Response (AVR) technology.

The telebanking service provides all the functions offered by ATM except withdrawal and deposit. The BSN Commercial allows stock exchange transactions through telebanking. According to Leow (1999), telebanking has numerous benefits for both customers and banks.

There is an increased convenience; expanded access and significant time saving for the customers and for the banks. Meanwhile, the cost of delivery for telephone-based services are lower than branch based services.

Table 2.3
Phone Banking Services

No	Bank
1	Alliance Bank Malaysia Berhad
2	Arab Malaysian Bank Berhad
3	Bank Islam Malaysia Berhad
4	Citibank (M) Berhad
5	EON Bank Berhad
6	Bumiputra-Commerce Bank Berhad
7	HSBC Bank Berhad
8	Malayan Bank Berhad
9	OCBC Bank (M) Berhad
10	Public Bank Berhad
11	RHB Bank Berhad
12	Southern Bank Berhad
13	Standard Chartered Bank (M) Berhad
14	Hong Leong Bank Berhad

(Source: The Star, Business Section, August 6, 2001)

Telebanking service is not considered as a major delivery channel for Malaysian commercial banks because of poor marketing strategy and it does not offer cash withdrawal facility for the customers. Furthermore there is a lack of confidence in using telebanking services especially in the older generations. This could be because the older generations are

still in a technological dilemma and are not keen to use technology for their own purpose compared to the younger generations. They may lack of confidence among older generations in using technological devices.

2.3.3 PC Banking

PC Banking was introduced in 1990 and at the end of 1995, according to Central Bank of Malaysia's report (Central Bank of Malaysia's Report, 1995), ten local Malaysian commercial banks had already been offering PC banking or home banking services. Customers will be able to access the Intranet proprietary desktop electronic package to perform cash management, account receivables and account payables. The number of customers using PC banking is still small in Malaysia because of computer facilities which are not offered in many remote places. In 1999, there were 500,000 Internet account holders in Malaysia and 1.5 million effective internet users (Suganthi et al, 2001). Based on a recent report, the number¹ of internet subscribers until March 2000 was 1.3 million which is approximately 7% of the Malaysian population (Lal P.K, 2000).

2.3.4 Automated Self Banking Centers (ABC)

Apart from Telebanking and PC banking, Malaysian banks have established Automated Self Banking Centers, which incorporate information counter, ATM's telebanking and banking booths.

ABCs are usually situated in shopping malls and office complexes. Philleo Allied Bank has implemented Virtual Multimedia bank kiosks in Malaysia with PALVIRTUAL KIOSK, which consist of PALWORLD, PALPOINT, PALPHONE and PALTELLER touch screen terminals with video conferencing capabilities.

The customers can log in to PALWORLD to do banking transactions, online shopping, utility bill payment, share investment, flight bookings, hotel reservations and dealings with Kuala Lumpur Stock Exchange (KLSE). PALPOINT is a new generation ATM facility that is connected to over 2500 ATM's via GREAT and MEPS network nationwide. And PALPHONE is the telebanking component of virtual kiosk, which provides a variety of banking products and services via Automated Voice System (AVS). PALTELLER is a new generation terminal, allowing customers to conduct banking operations on-line via a touch screen interface with video conferencing capabilities where customers will be able to see and speak to a customer service officer located at the head office.

Table 2.4
Examples of Net Services

BANK	SERVICE	TRANSACTIONS
Southern Bank	PC Banking	Real-time fund transfers, credit-card payments, access account balances and auto alerts.
Hong Leong Bank	<u>Bank@Home</u>	Fund transfers, balance enquiries, statement download, bill payments, cheque-book request, cheque-status enquiry, stop cheque and credit-card payments.
HSBC Bank	Hexagon	A desktop-banking system via the HSBC Group's proprietary worldwide communications network. Services include transfer of funds within own accounts and third-party accounts.
Multi-Purpose Bank	Multi-Link	Basic banking services - account balance enquiry, fund transfer, bill payments and product info. Also offers desktop share-trading via JB Securities Sdn Bhd.
PhileoAllied Bank	PALDIRECT PALWORLD	Provides banking, share investing, news and information, utility-bill payments, insurance, travel, electronic shopping and communications services.
RHB Bank	RHB OnLine	Balance enquiry, fund transfer, remittance services, fixed-deposit placements, credit-card payments, brokering and bill payments.

Banks offering Internet banking can be categorized into Level 1-Basic Presence and Level 2-Prospecting (Deloitte Research, 2000). The level 1-Basic Presence can be defined as banks having the web just for advertisement purposes while the level 2-Prospecting is for banks that offer full internet services. Most of the Malaysian banks are currently at level-2 prospecting of the Deloitte model of Internet Banking.

All banks providing Internet Banking should operate at the highest level of security. These banks depend on Secure Sockets Layer (SSL) protocol as well as 128-bit encryption to encrypt data entering the bank server and verify the bank server to the users.

2.3.6 WAP Banking

WAP banking can be defined as a mobile phone banking, which has been introduced with the emergence of the telecommunication technologies such as Global Packet Radio Services (GPRS) and 3G phones. The table below shows the banks offering mobile banking services.

Table 2.5
Examples of Mobile Phone Banking Services offered by Banks

BANK	NAME	SERVICES
OCBC Bank	i.wap	Banking transactions - balance enquiry, transaction history, statement request, fund transfer, cheque-book request, stop-payment request, bill payments. Others - news, banking rates, treasury news and credit-card services.
Philoe Allied Bank	Palworld WAP	Banking transactions, bill payments, news, share trading.
United Overseas Bank	Mobile-phone banking	Banking transactions such as balance enquiry, statement request, increase in credit-card limit and others.

This have shown a tremendous development among Malaysian banks to compete with the foreign banks with better facilities, use of technologies in delivery services, and the need for quality based services. The local banks also need to be competent in terms of human resource. The banking executives need to be more knowledgeable and skillful in the banking industry in order to make a strategy decision making for the banks and the nation as a whole. The Malaysian government has been actively involved in K-economy and knowledge based industries which need to be absorbed by the banking industry.

2.4 Simulation System

Simulation can be defined as imitating a real phenomenon. Usually computer simulation is used to predict aspects of the behavior by creating an approximate model of it.

The usage of computer simulation began in the late 1950s and has gradually applied across multiple disciplines. Researchers began to move beyond static process development to a more dynamic process development, which is able to show the dynamic behavior of a system or an interactive system.

The main objective of a system simulation is (Levary et. al. 1991):

1. To understand the relationship within a complex system
2. To experiment with the model to assess the impact of actions, options and environmental factors.
3. To test the impact of various assumptions, scenarios and environmental factors
4. To predict the consequence of action on a process
5. To examine the sensitivity of a process to internal and external factors

According to Levary et.al.(1991), many organizations are using simulations based system for training and forecasting purpose. Simulation provides a safe way of estimating the effects of extreme situation without affecting real life experiment.

2.5 Computer Simulation Development

In terms of system development, many simulation languages have been produced such as SLAM II, SIMSCRIPT, SIMAN, GPSS and DYNAMO. The simulation language offers some advantages to the modeler (Law and Kelton, 1991):

1. Simulation languages provide most of the features and constructs needed for programming a simulation model
2. Simulation model are easy to modify if written in simulation language
3. It provides error detection features for the programmers
4. The modeling approach is easily matched to the simulation languages. As an example the Pristker's approach maps directly to the simulation languages.

There are also some newly developed simulation products and services, which are more user friendly such as:

1. Adaptive Learning Platform(X.ACP)
2. Amethyst Research LLC(service offering)
3. ASCOLTA(service offering)
4. CADSIM Plus 2000(Aurel System Inc)
5. Cognitive Arts Corp(service offering)
6. Forio Server

The emergence of specialized authoring tools is a clear sign of both demand and the market creation of simulation-based products. RWD, Global

Knowledge, xStream, Ayaltus, Epiance, Knowledge Mechanics, EDT Learning and Multiverse are just few of the companies that sell specialized development tools. E-learning vendors are already adding simulation based products on their catalogues (Bosman, 2002).

The principles of dynamic modeling process can be applied to a wide range of systems: from deterministic physical systems such as car engine, to stochastic physical systems, such as a weather system, to an organizational system and business management system. The development of simulation based product is complex in nature as it involves a lot of variables that need to be tested as in the real time environment. There are also a lot of aspects that need to be taken into consideration while developing the system as the variables may inter relate with each other. The development of effective simulation product is difficult, time-consuming and expensive. For moderately complex e-learning project done by moderately experienced team, figures of 200 person-hours per instruction-hour are common (Horton, 2000).

There are six types of simulation system (Hall, 2000):

1. Software Simulation – IT/application training
2. Business Simulation – teaching business management skills, running mock companies and accounting practices.
3. Situational Simulations – interpersonal skills, soft skills, conversational skills
4. Technical Simulations – simulations of physical system such as a piece of equipment or simulating processes through diagrams

5. Procedural Simulations – teaching step by step processes
6. Virtual Worlds – teaching by re-creating environments, workplace etc

Beyond all this categories, the developed simulation needs to be fun to keep up the momentum (Bean, 2000). According to Bean, the development of fun simulations is memorable experience because people play and learn from them without being compelled to. At the same time the user will be able to develop and internalize rules for success that they can intuitively apply in the real world. Furthermore, Bean has listed twelve important factors to develop a fun simulation:

1. Ten Minutes to Learn, a Lifetime to Master

The rules should be easy to explain but the simulation should be complex enough that it takes several rounds for a user to become expert in the field.

2. Small Successes

The user needs to feel the success even though the competition is difficult. This is to make sure that the users are comfortable with the system. Reward, don't punish.

3. Players are in control of their destiny

The players must make a decision to figure out the best way to win the game.

4. Customization

The users should have some control or ability to create their own simulation.

5. Trade-offs

There should be a clear downside to every decision.

6. Dynamic

7. Realism

Players enjoy games more that look and act like the world that's represented in the game. Managers should see reports in formats they are familiar with. If the company uses emails or memos to communicate, then memos and emails should be included in the simulation.

8. Fantasy

Business simulations combine well with scenario planning exercises. Scenario planning engages managers to think about what could happen in the future and the business simulation fleshes out the scenario and makes it feel real. The simulation also provides managers with the opportunity of working through strategies to deal with specific scenarios.

9. Good Design

The graphical design is the first impression that players have of the simulation. Like all first impressions, the graphic design is going to affect the long-term perceived quality of the simulation. The graphical design is the first impression that players have of the simulation. Like all first impressions, the graphic design is going to affect the long-term perceived quality of the simulation

10. Appropriate for the medium

There have been some excellent simulations created without using computers, just like there are great games that do not use computers.

11. Human Interaction

Creating a community, through collaboration or competition, is one of the best ways to make a simulation exciting

12. Personalities or talent

To top things off, participants need to have good personalities with their simulation. It is engaging to have a senior manager from the company introduce the simulation through a short memo or a video clip.

A perfect simulation should be realistic and effective if it (Horton, 2000):

1. Implements the causal relationships and principles of the real-world system learners must master.
2. Contains details necessary for the learner to map components of the simulation to their real-world counterparts
3. Lets learners control the aspects of the simulation they would control in the real world.
4. Make learners feel they directly control the subject of the simulator without awkward intermediate steps.

2.6 Simulation System in Training and E-Learning

Computer simulation is actually an extension of e-learning concept. Basically e-learning concept has been introduced to merge with the current technology. Traditional e-learning - what is sometimes referred to as first generation e-learning- is now past the market creation phase and well into a value creation phase (Hall, 2000).

E-learning was regarded as a failure in creating quality based education (Guralnick, 2002). According to Guralnick the failure of e-learning is because:

1. Trainees are less involved in creating the e-learning modules
2. Lack of appropriate software tools for trainers – most of the application software involves technical programming which is difficult for the trainers who do not have technical background.
3. Technical implementation details take time, preventing trainers from focusing on context and pedagogy.

Furthermore, Guralnick gave three solutions for the problem:

1. Introduce Learning Architecture – Interactive learning and technology to support the application and training
2. A technical engine, invisible to users, to support personalization and customization
3. An e-learning creation “control-center” with authoring methods intuitive to trainers. The development software should be user-friendly and usable.

The solutions given by Guralnick and other researchers’ show that the advancement of technology has created a major leap in the interactive based learning or simulation based training method. Simulations are based on a simple, but effective, learning strategy – practice makes perfect (Hall, 2000).

In other words, the corporations are already convinced with the cost effective benefits and are utilizing e-learning tools to train and develop their workforce. But with current demand, the corporations are already compiling a list of feature enhancement requests such as increased interactivity and motivational components. One feature that leads the request is the development of simulation. The corporate training and development is important with the

rising global competition, information and communication technology explosion and corporation's rising interest in capturing and developing human resources. This factors forces the workers to learn while working and the best method is through interactive learning. At the same time the demand for simulation based e-learning in corporate world is being driven by a variety of factors (Adkins, 2002), including:

1. The availability of high simulation technology on PC systems
2. The customer demand for advanced e-learning products
3. The rapid convergence of enterprise software and technology
4. The emergence of the virtual platform known as Web Services

Today, with the development of software tools to create animation and interactive applications, the simulation based applications are being used extensively both in the education and industrial sector. The e-learning concept has been slowly transformed into web based e-learning simulation which is much more dynamic and customizable to the users all around the world. The development of broadband technology and the usage of internet have extremely helped for the development of web based e-learning simulation. The simulation based e-learning can be defined as a delivery of simulation based online training. According to the current research, by 2006, the market for simulation based e-learning products and services will be over \$6 billion (Adkins, 2002).

Simulation is grounded as action learning. While individuals may each perceive information through their senses, people ultimately learn by doing (Kolb, 1974). David Kolb, learning theorist and author of *Experiential Learning*, describes learning as a four-step process as shown in Figure 2.1: (1) watching, (2) thinking, (3) feeling, and (4) doing.

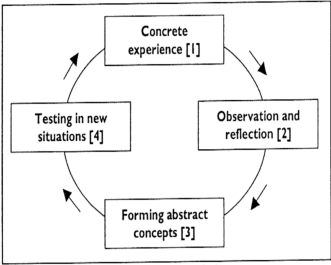


Figure 2.1
Kolb's Experiential Learning Process

Referring to Figure 2.1, learners have concrete experience that allows them to reflect on new experiences from different perspectives. From reflective observations, learners engage in abstract conceptualization, creating generalizations or principles that integrate observations into sound theories. Finally, learners use these generalizations or theories as guides to further action. Active experimentation allows learners to test what they have learned in new, more complex situations. The result is another concrete experience, but this time at a more complex level. The Kolb Strategy can be fully utilized through a simulation system. The assumption that can be derived from the Kolb Strategy is that people seldom learn from experience unless they are

given the opportunity to test and analyze the environment. This is only applicable through simulation.

There are many advantages of using simulation based system. The most important advantage is that the cost of failure is low as it provides a safe way to experiment the real life environment. As the learners need individual training, the application can be customized according to the user's perspective. The organization will be able to save time by training many people at a given time duration compared to the traditional training system. The simulation based system is able to accommodate complex tasks in a short duration. This is very important for the trainees in order to understand certain task, which is associated with analysis based task.

Furthermore, the simulations provide the opportunity to experiment with many different scenarios and see the effects on key measures (Hall, 2000). The users will be able to transform the factual knowledge by applying the knowledge and the skills in the simulation based system.

2.7 Simulation of Banking Management

Financial based simulations are used extensively in both educational and industrial sector. Simulation games have been used in business schools since 1957 (Watson, 1981). A 1962 survey of 107 AACSB member schools in the USA reported that 71.1% were using simulation

games in at least one course (Dale & Klasson, 1962) within the business faculty. Two surveys of AACSB member schools undertaken in 1967 indicated that 90.7% (Graham & Gray, 1969) and 94% (Day, 1968) of the responding schools used simulation games in their curricula. Roberts and Strauss (1975), using the same sample of schools as used by Dale and Klasson (1962), reported that 94.5% of the responding schools were then using simulation games. Finally, Faria (1987) reported that 95.1% of AACSB member schools used at least one business simulation game in their program during the 1985-1986 academic year.

According to Faria (1987), business school deans then were asked which disciplines within their faculties were currently using simulation games. The responses to this question, along with a comparison to the Faria (1987) survey that also addressed this issue, are shown in Table 2.6.

Table 2.6
Simulation Usage at AACSB Member Schools by Discipline

Programs	Faria(1987)	Survey (%)	Faria(1998)	Survey (%)
Business Policy	107	52.9	155	65.7
Marketing	103	51.0	148	62.7
Finance	50	24.8	92	39.0
Management	36	17.8	105	44.5
Accounting	18	8.9	37	15.7
Other courses	34	16.8	44	18.6

Simulation usage is up at both the undergraduate and graduate levels since the 1987 survey, and currently, 77.8% of the responding deans indicated that simulation games are being used at both the undergraduate and the graduate levels at their schools. Furthermore, as Table 2.7 suggests, most schools are using simulation games in more than one discipline.

Finally, the deans were asked about other uses of business simulation games within their faculties. Eighty-seven deans (36.9%) indicated that their students take part in intercollegiate simulation competitions, and 79 deans (33.5%) indicated that business simulation games are being used in executive development seminars/programs at their universities.

Table 2.7
Mean Rating of Teaching Method Effectiveness

Teaching Method	Faria(1987) Study	Faria(1998) Study
Lecturers	7.5	6.6
Cases	7.4	6.9
Business games	6.1	6.1
Textbooks	5.4	6.0

NOTE: Based on a scale from 1 (low) to 10 (high)

Table 2.8
Mean Rating of Teaching Effectiveness by Simulation Users and Nonusers

Teaching Method	Faria(1987) Study		Faria(1998) Study	
	Users	Nonusers	Users	Nonusers
Lectures	6.8	7.7	5.9	6.9
Cases	6.2	7.8	6.8	6.9
Business games	7.1	5.8	7.9	5.5
Textbooks	5.2	5.5	5.5	6.3

NOTE: Based on a scale from 1 (low) to 10 (high)

In both the Faria studies, business simulation games were ranked third in teaching effectiveness behind lectures and cases and ahead of only textbooks.

When the results examined by simulation users and nonusers, as would be expected, simulation user's rate business games much higher than nonusers do (7.9 to 5.5). This disparity is wider than reported in 1987

as Table 2.8 shows. Business games rank highest in teaching effectiveness among simulation users, but among nonusers business games rank lowest.

Furthermore most of the financial sectors have been involved in the simulation training system. As an example, Ameren Corporation, USA, has asked all the finance executives and managers to compete in

computerized simulations that let them control more than 20 financial variables, such as lowering expenses, acquiring new business and increasing or decreasing debt. The team that produced the best financial results over a simulated 10-year period will win the competition (Solomon, 2002). According to Solomon, "Learning is made up of mistakes, and the simulation exercise allows them to make mistakes in a controlled environment" (Solomon, 2002).

The banking simulations include both general information and employee or job specific information that makes the training relevant to each and every audience so that it can integrate the two when the site is accessed so the end user does not need to read through information and examples that are not relevant to him (Guralnick, 2002).

Malaysian higher educational institutions should be proactive in introducing simulation based e-learning system to better equip the graduates with knowledge and skills by practicing the real scenario through simulation systems. The only way to expose students to the working environment and to gain experience in banking industry is through simulation based e-learning concept.

There is a lot of development in financial based products in foreign countries such as Financial System Simulator (FSS), Bank President and InterBank Simulation System.

2.7.1 Financial System Simulator (FSS)

FSS is an internet based interactive teaching aid that introduces undergraduate students to the domestic and international consequences of monetary policy (Santos, 2002). FSS was implemented at South Dakota State University during the fall 1999. According to the university's survey, 90% of those surveyed agreed the simulation should be a permanent component of the money and banking course. Most economic faculty agrees that interaction exercises maintain (or gain) the students interest in economics, as well as dispel their preconceived notions that economic theory is an esoteric subject (Goerce and Holt, 1999).

The FSS uses the client server technology with the server doing the churning, calculation and processing of the computer code. The students will participate in the FSS for a period of six weeks and the Instructor will check the progress of the team. The teams need to download their summary statistics and prepare graphs for the presentation. The banking component of FSS focuses on commercial banking theory, including information asymmetries, structure and legislation, investment banking and international finance.

2.7.2 InterBank Simulation

There is also another simulation, which is called as InterBank Simulation Game. This system is able to bridge the gap between the Executive level (strategy) and Operational level (operations) within the organization. It also accelerates the development time of key personnel/targeted personnel through a steep learning curve. The system will be able to simulate the operations of a universal bank based on the decision of the management teams. The basic operational unit of the program is the individual bank. For each quarter the system will calculate the earnings and operating results of each team.

2.7.3 Real Money Simulation System (<http://www.profalrecht.com>)

Real Money Simulation system is an accounting simulation system created by W.David Albrect. According to Albrect the objective of Real Money is to help students learn the accounting cycle in a dynamic business environment and experience the financial statement analysis and investment decision processes that follow from financial report. The game is a contest with specific goals and rules.

According to Heyman (1975), simulation game like Real Money is an activity whose rules tend to generate in the total behavior of the participants and model of some real world process. The game helps the students to increase the ability to apply concepts and principle of

accounting. Through the system, the participants experience greater attitudinal change compared to students engaging in a more traditional learning environments.

The simulation system offers the potential for students to attribute greater value to accounting information in the decision-making process. The students also require flexibility in thinking and an adaptive response to a dynamic environment. Real Money is currently available in two version, which emphasizes in debits and credits and is most appropriate for Intermediate Accounting. The second version, most appropriate for MBA classes, uses the balance sheet equation to account for transactions.

In order to play the game, the class is divided into gaming groups with each games representing a distinct and separate local market. Students need to create a company in each local market which will be operated by one or two students. Each company will play the monopoly game to win. The companies should be able to do investment or purchase real estate properties.

The Real Money simulation system consists of two primary components, which are accounting and investing. Each company will then plays for 12 turns (1 year) and prepare financial statements. The instructor will assign the students to a gaming group to play the game. Each company will be managed by two students. The students need to

meet four times during the course to play the game, which will last about one hour.

Each team will decide about their responsibilities in making decisions and managing record keeping in a manager diary. Even though they play in a team, each student member is to do the accounting and investing alone, with no consultation or help from the other team member.

In order to start the game the companies will be given a capital of \$1,500 in cash from the bank. A month starts when the first company rolls the dice. A month ends after the last company has had a chance to move and has completed transaction. During a month, a company may have transaction as it moves around the board, or when another company takes an action that affects it. Each complete turn is a month. There are 12 months in a year. The simulation system teaches about strategic decision making and also in using journal and balance sheet in updating their records.

At the same time the game is not just about using the simulation. The trainees will be provided with assignments related to financial and accounting. The students need to submit the assignment during the submission of financial reports for every month. A sample assignment is shown in the Appendix B.

The game focuses on three important components which are journals, balance sheet and income statement. The variables included in the balance sheet are shown in Table 2.9. The Real Money simulation system is able to generate the balance sheet for all the years.

Table 2.9
Balance Sheet at year end (Turn 12) for years

	<u>Year</u> <u>1</u>	<u>Year</u> <u>2</u>	<u>Year</u> <u>3</u>	<u>Year</u> <u>4</u>
Current Assets				
Cash	\$662	\$422	\$734	\$550
Receivables	<u>100</u>	<u>100</u>	<u>50</u>	<u>50</u>
	762	522	784	600
Noncurrent Assets				
Notes Receivable	0	0	0	0
Investments in Railroads & Utilities	200	800	800	800
Land	1,140	1,500	2,960	2,960
Houses (Net)	0	0	991	1,803
Hotels (Net)	0	0	0	0
Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	1,340	2,300	4,751	5,563
Total Assets	2,102	2,822	5,535	6,163
Liabilities				
Interest Payable	0	0	0	2
Taxes Payable	60	78	279	85
Mortgage Payable	0	0	0	60
Notes Payable	0	0	0	0
Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Liabilities	60	78	279	147
Owner's Equity				
Contributed Capital	1,500	1,500	1,500	1,500
Retained Earnings	<u>542</u>	<u>1,244</u>	<u>3,756</u>	<u>4,516</u>
Total Owner's Equity	2,042	2,744	5,256	6,016
Total Liabilities and Owner's Equity	2,102	2,822	5,535	6,163

The income statement will be generated at the end of each year and the students will be able to view the income statement for four years and make a comparison to analyze their performance as shown in Table 2.10.

Table 2.10
Income Statements for years ended turn 12

	<u>Year</u> <u>1</u>	<u>Year</u> <u>2</u>	<u>Year</u> <u>3</u>	<u>Year</u> <u>4</u>
Rent Revenue—Undeveloped Property	\$30	\$62	\$92	\$38
Rent Revenue--Houses and Hotels	0	0	70	680
Investment Income	<u>0</u>	<u>200</u>	<u>1,000</u>	<u>200</u>
Total Rental & Investment Income	30	262	1,162	918
Rent Expense	78	82	120	228
Repair and Maintenance Expense	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Net Rental Income (Loss)	(48)	180	1,042	690
Salary Revenue	500	400	550	200
Miscellaneous Revenue	<u>150</u>	<u>200</u>	<u>125</u>	<u>95</u>
Total Revenues	602	780	1,717	985
Depreciation Expense	0	0	9	88
Amortization Expense	0	0	0	0
Miscellaneous Expenses	<u>0</u>	<u>0</u>	<u>225</u>	<u>50</u>
Income from Operations	602	780	1,483	847
Interest Revenue	0	0	0	0
Interest Expense	0	0	0	(2)
Gains on Disposal of Property	0	0	1,310	0
Losses on Disposal of Property	0	0	0	0
Other Gains/Losses	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Pre-tax Income	602	780	2,793	845
Income Tax Expense (Refund)	<u>60</u>	<u>78</u>	<u>279</u>	<u>85</u>
Net Income	542	702	2,514	2,514

2.7.4 Bank President (<http://bpaosf.bpa.arizona.edu/~ruscher/>)

The Bank President Simulation system is both educational and entertaining. The objective of the system is to teach the concepts of bank management. The participants are trained to make better decision which will be administered by an instructor. The instructor will be given full authority to supervise the competition.

Currently the Bank President appears in two version which are student version and instructor version. The student version software will be initiated in student's workstation while the Instructor's version will be installed in the Instructor's workstation. The simulation system supports one to ten banks to compete each other in every competition. The game is also played with computer as one of the opponents.

In order to play the game, each group need to register with the system by specifying the President's name, username and password, bank name and type of banking to be chosen. Once the data have been entered, it will be saved inside a diskette and will be given to the Instructor to configure the system setting. There are fixed amounts of loans and deposits available in the economy at a given time and the data will be determined by the actual historical data from the US economy at various time. The banks need to choose any of the economic year or it will be selected randomly.

The banks registered for the competition will try to compete with each other to earn their loans and deposits. The banks will try to find strategies to attract customers to their bank. As an example, in order to attract more deposits, some of the banks may increase their interest rate and do more marketing. The game will be played for four quarters, which is equal to one year and each group need to show their management report with detailed financial performance of their own bank.

In order to begin playing the Bank President, the instructor must start a new game. This will be done through the instructor's software version. Then the instructor needs to specify:

1. Bank's name
2. Game title
3. Number of banks competing in the game
4. Instructor name and password
5. Economic period
6. Type of Bank Management: Human Management or Computer Management
7. President's name
8. Bank Type: Full Service Bank, Consumer Bank, Business Bank and Turnaround Bank

The student will give their diskettes to their instructor, which has the important data such as bank name and all other information. The instructor will configure the regulatory environment, which consist of:

1. Loan rates
2. Deposit rates
3. Maximum capital
4. Federal Reserve Borrowing
5. Tax rate

The instructor can change the regulatory environment at the time a new game is started or at any time during the course of a game. The instructor will notify the students at least one quarter in advance of changing the regulatory environment to give students time to prepare for the change. In each quarter, the participants need to review the results of the previous quarter before making any decision for the next quarter. Once the decision has been done for each quarter, the student will save the details in a diskette and send it to the Instructor. The participants will be able to make decision on the variables shown below:

1. Deposit Rates
2. Loan Rates
3. Expenses
4. Dividend
5. Policy Limit
6. Security Purchase

7. Security Sales
8. Capital Notes
9. Common Stock
10. Loan Sales

In order to advance to the next quarter, the instructor needs to select "Advance the game to Next Quarter from the menu selection. Advancing the game to next quarter causes Bank President to read decision from the student's diskette, calculate new results for all banks and then write the new results onto the student's diskette.

The most important financial reports that need to be produced for each quarter are the Balance Sheet and Income Statement. The Balance Sheet shows the condition of the bank as of the first day of the quarter. The balance sheet is divided into two parts. The first part is called "Assets". This part of the balance sheet shows what the bank has done with money it has raised. The Assets side of a Bank President bank's balance sheet is shown in Figure 2.2 below:

<u>ASSETS</u>	<u>\$ Millions</u>	<u>Percent</u>
Cash	80	7.3
Fed Funds Sold	0	0.0
Securities	285	25.9
Loans	720	65.4
Premises	<u>15</u>	<u>1.4</u>
Total Assets	1100	100.0

Figure 2.2
The Asset Categories for Bank President

The balance sheet will be prepared as of the first day of each quarter. The other side of the balance sheet is called as “Liabilities and Equity”. This side shows where the bank got the money that is accounted for on the “Assets” side of the balance sheet, as illustrated in Figure 2.3.

<u>LIABILITIES & EQUITY</u>	<u>\$ Millions</u>	<u>Percent</u>
Deposits	984	89.5
Fed Funds Purchased	50	4.5
FRB Borrowing	0	0.0
Capital Notes	13	1.2
Equity	<u>53</u>	<u>4.8</u>
Total Assets	1100	100.0

Figure 2.3
Liability and Equity for Bank President

Since the bank must account for all of its money, the total on the assets side of the balance sheet must always exactly equal to the total on the liabilities and equity side of the balance sheet. This actually shows where the money comes from and the other shows where the money is now. The first four categories above are called “liabilities” because these funds do not permanently belong to the bank, as the bank needs to repay these funds. The “equity” is money that permanently belongs to the bank.

The participant needs to earn money through assets and pay money to acquire its liabilities. In accordance to this simulation system, the largest asset category is “loans” while the largest liability category is “Deposits”.

The banks need to earn income through interest paid by the depositors and fees charged for services provided by the bank. In Bank President, the non-interest expenses include bad debt expenses, salary and occupancy. The next financial report is Income Statement which shows the profit gained by each bank. The variables included in Bank President's Income Statement are shown in Figure 2.4 below.

<u>Income Statement</u>	<u>\$ Millions</u>
Interest Revenue	32.3
Interest Expense	-18.8
Fee Income	4.0
Non-Interest Expense	-9.5
Taxes	-3.9
Non-Operating Income	<u>0.0</u>
Net Income	4.1

Figure 2.4
Income Statement

For each quarter, the participants need to compare their actual Bank President's Income Statement with their targets. If the income statement is close to the target level, the bank can continue with their policies. However, if there is decrease in the net income then they need to identify then problem area.

Bank President's economic environment contains 100 periods of economic data. The economic data was taken from the US economy at various times in the past. The instructor need to select the beginning economic period or will be able to select a random beginning economic

period. There are nine important components, which reflect the economic data for each period as shown below:

1. T-bill rate
2. T-note rate
3. Fed Funds rate
4. Real Estate Loan Rate
5. Prime Rate
6. Percentage change in CPI
7. Percentage change in commercial loan balances
8. Percentage change in consumer loan balances
9. Percentage change in real estate loan balances

In simplest terms, a bank must first obtain funds. These funds come from deposits with the bank, funds the bank borrow from various sources, funds the bank receives by issuing its common stock and funds that the bank retains from its profits. The bank uses these funds as cash or deposited at the Federal Reserve Bank, investment in securities, loaned to individuals, businesses and other banks and some is invested in the premises from which it conducts business.

2.8 Conclusion

Most of the banks that use internet-only business model are struggling for profitability, and emerging conventional wisdom states that internet-only banking is a failed business model. But this may be premature. As internet-only banks age, they accumulate experience which may allow them to operate more efficiently in the future, and as they grow larger they may generate scale-based savings not available to traditional banks that use less capital-intensive production and distribution technologies. In order to establish technology based banking, Malaysian Financial Institutions need skill based employees and this can be accomplished by simulation based training system for both bank executives and students.

Simulations can be a useful instructional tool in any classroom contexts. McKeachie (1994) argues that "the chief advantage of games and simulations is that participants are active participants rather than passive observers. Beyond the simulation, collaborating with students in this way provides an opportunity to mentor a group of students. With the introduction of banking simulation games such as Bank President and Real Money simulation, the banks will be much more capable of using intellectual skills and values enquiry in a rational approach to problem solving and decision-making. The simulation system provides a strategic planning process for the bank executives in today's fast growing banks.