

A PERSPECTIVE ON THE CRITICAL SUCCESS FACTORS FOR INFORMATION SYSTEMS DEPLOYMENT IN ISLAMIC FINANCIAL INSTITUTIONS

Mudiarasan Kuppusamy
Centre for Innovation & Industry Studies (CInIS)
College of Business, University of Western Sydney
Locked Bag 1797 Penrith South DC, 1797 NSW Sydney
Email: m.kuppusamy@uws.edu.au

Murali Raman
Faculty of Management
Multimedia University, 63100 Cyberjaya, Selangor, Malaysia
Email: murali.raman@mmu.edu.my

Bala Shanmugam
School of Business, Monash University
Bandar Sunway, Petaling Jaya, Selangor Malaysia
Email: bala.shanmugam@buseco.monash.edu.my

Santhapparaj Solucis
Faculty of Management
Multimedia University, 63100 Cyberjaya, Selangor, Malaysia
Email: santhapparaj@mmu.edu.my

ABSTRACT

Successful deployment of new information systems is vital for efficient business operations. Empirical and conceptual research papers have provided various success factors for IS implementation in various type of organizations. There is very limited focus on the success factors in the context of Islamic financial institutions, which is now regarded as one of key players of global financial landscape. Successful adoption to new IS applications and tools is paramount in creating and sustaining growth for financial institutions including Islamic financial institutions. This paper presents some of the critical success factors that need to be considered during or before implementing IS applications and tools in Islamic financial institutions.

1. INTRODUCTION

Competition in the banking sector has intensified over the past few years, largely due to globalization and technological advancement. Technological advancement in this context has fuelled greater challenges as customers today are pampered with choices – they can change banks by just a click of the mouse. Customers are looking for unique services from banks, and banks are heavily leveraging on information systems (IS) to maintain customers' loyalty. Prior to investing in IS, banks must diligently evaluate the direct and indirect cost-benefits from IS investment as it is a major portion of the organization's capital expenditure. Thus banks are required to ascertain that there IS investment is economically justifiable. Increasingly, banks have the following needs:

- Streamlined business processes and IS structures that are less complex
- IS structures that are flexible and allow quick adjustments in the business processes of supporting operations

- Easy integration of new functions and processes without harm to either the underlying technology or previous investments
- Personalized data, tools, and solutions that employees can access anywhere at any time

Meeting these demands puts new pressures on the systems banks use for IS. Besides increasing efficiency behind the scenes, IS system must improve integration between business processes and technology for seamless transparency between the corporate applications. The commonly used revenue diversification, consolidation and risk securitization strategies are no longer relevant today (IBV, 2003). Today it is about strategic investment in IS that provides competitive edge to banks.

This paper looks at the importance of technology to Islamic banks operation and profitability. This paper also highlights the importance of effective management of technology investment in order to maximizing return from such investment. The rest of the paper is organized as follows. Section 2 highlights the historical perspective of IS utilization in banking sector. This is followed by a discussion on IS investment in banks in Section 3. Section 4 presents the current scenario of IS in Islamic banks, while Section 5 presents the factors that drives IS deployment in the banking sector. Section 6 the conclusion and policy suggestions.

2. AN OVERVIEW OF IS EVOLUTION IN THE BANKING SECTOR

The evolution and development of IS in the banking sector can be traced way back to the 1800s. Much of the technological changes in banks was initiated in developed countries, and was gradually adopted by banks in other parts of the world. The evolution of IS in the banking sector can be categorized into four periods – Early Adoption Era (1864-1945), Specific Application Era (1945-1965), Emergence Era (1965-1980) and Diffusion Era (1980 onwards) (Table 1 provides the summary of the evolution).

Table 1: Evolution of IS in the Banking Sector

Functional Category	Early Adoption Era (1864-1945)	Specific Application Era (1945-1965)	Emergence Era (1965-1980)	Diffusion Era (1980 onwards)
<i>Service function</i>	Reduce inter-market price differentials	<ul style="list-style-type: none"> • Conversion from branch to bank relationships • Automated bank statements • Cheque guarantee 	<ul style="list-style-type: none"> • Growth of cross-border payment • ATM introduced 	<ul style="list-style-type: none"> • Supply of non-payment products like insurance, mortgages and pensions
<i>Operational function</i>	Increased coordination between head office and branches	<ul style="list-style-type: none"> • Reduce cost of labour intensive activities (i.e. clearing system) 	<ul style="list-style-type: none"> • Automation of branch accounting • Real time control begins 	<ul style="list-style-type: none"> • Growth of alternative distribution channels e.g. phone banking, EFTPOS, Internet banking

Source: Adapted from Battis-Lazo and Wood (2002)

2.1 Early Adoption Era (1864-1945)

During the early adoption era, formal communication tools were introduced in the banking sector. In 1846, the introduction of the telegraph system helped to decrease stock price disparity between New York and other regional stock markets (Garbade and Silber, 1978). The introduction of the trans-Atlantic cable in the year 1866 enabled stronger integration between stock markets in New York and London. Technology in the early adoption era had little impact on the bank's front office procedures – that is the way in which transactions between customers and bank were conducted. During this period, customers accessed the banking system either via bank branches or representative agents (e.g. mortgage specialists or savings banks) and were largely unaffected by technological developments. For example, banks kept their customers' records in analogue systems such as paper based records and pass-books.

By end of 1930s, banks began using tabulating machines to address larger volume of transactions. This enhanced staffs job productivity and efficiency dramatically (Wardley, 2000). In later years, banks began investing on adding and listing machineries to support the growth of bank branches and agents. By mid 1940s, banks gradually started employing low level technological gadgets (i.e. interactive IS applications) in their banking operations.

2.2 Specific Application Era (1945 – 1965)

By late 1950s, the second wave of technological developments in banking sector took place. During this period, computers were introduced into the banking system. Computers aided banks in recording of transactions, solving specific problems in bank operations, and to automate certain banking transactions (BBC, 1995). By mid 1960s, giant technology corporations such as IBM have established high powered computer applications, which were used extensively in banks. During this period, bank's automation was directed mainly at the back-office operations. This helped in decreasing the cost of administration tasks such as cheque clearing system (which was predominantly labour intensive task prior to the automation process). In due course, bank branches were also automated in order to improve market-wide processes.

By 1965, most major banks in the US and UK had introduced electronic data processing (EDP) in their operations. In later years, banks began introducing the Database Management system (DBMS) that solved the problem of high data volume. This system basically provided generalized, structured and integrated body of data that could be read and updated in a controlled, efficient and reliable manner (Fincham et al., 1994). Subsequent to this, the inter-bank voucher-less payment facility known as the Bankers' Automated Clearing System (BACS) was introduced in banks in 1968. By 1976, BACS was utilized in most banks in the US and UK as it helped banks to control costs related to cheque transactions (Cooper, 1984).

2.3 Emergence Era (1965 – 1980)

The third wave of IS developments in banking emerged hand-in-hand with advances in telecommunications. During the emergence period, banks became one of the world's dominant customers for computer-based applications, far exceeding other sectors such as capital goods manufacturers or transportation (Quintás 1991). Between 1968 and 1980 banks emerged as major customers of software and hardware as they introduced applications that delivered significant cost reductions as well as increased business volume and variety. The main difference between this and the specific application period was that the impact of computers was felt throughout the organization rather than in specific departments. The ability to achieve higher quality and lower cost in an unprecedented way established large

scale-economies in banking which were not offset by organizational discontinuities (Walker 1978).

Other distinctive characteristics for banking organizations during the emergence period included the introduction of full automation to branch accounting, real time operation and control of branches by the central office. During this era, customers were able to bank at any point in the retail branch network while the previous arrangement limited transactions to the customer's own branch or required telephone approval for remote transactions. In addition, account balances and redemption figures are immediately available ensuring a much speedier service to the customers. During the emergence period, the introduction of management information systems or MIS also took place (Fincham et al. 1994). These systems initially aimed to use the computational power of transaction-processing capabilities to provide regular reports and analyses of business activity. In this way MIS offered increased scope for monitoring control and planning of operational procedures in banks.

In summary, during the emergence period technological change spread to many internal aspects of banking organizations and permeated bank-client relationships. These changes started to modify how, when and where customers could enter the banking system. It is during this period that the convergence of telecommunications and computer power resulted in true IS applications as the emphasis of technological innovations shifted from data processing to communications.

2.4 Diffusion Era (1980 onwards)

The diffusion period of the information revolution in commercial banking saw the spread of IS to all aspects of banks' internal organization and market relationships thanks to the introduction of personal computers (PCs) in clerical and managerial roles. During this period, consumer-oriented innovations were widespread as information technology finally provided support to all points of contact between customers and bank, prompted by major overhauls of incompatible legacy systems undertaken in response to the perceptions of a major Y2K threat.

Incorporating, standardizing and exploiting IS-based innovations became a key issue in banks' long-term strategies. Moreover, IS applications offered banks greater anticipated advantage thanks to expectations of enhanced control of financial and strategic resources. Meanwhile, the most important consequence of the drive towards mass delivery of banking services during the diffusion period was that banks effectively moved from being places of decentralized personal relationships to ones run by institutional managers. During the diffusion period, banks began to create relationship databases instead of using skilled personnel at all points of contact with customers (BBC 1995). For example, Lesley Taylor (Head of Direct Banking, Royal Bank of Scotland) claimed that current technology allowed one person to develop in three or four weeks the skills that previously required five years in the job (BBC 1995; Morris 1986). Information technology applications, therefore, promised higher organizational flexibility to those banks that could effectively implement technical changes.

The second effect of technical innovations on banks' approach to business during the diffusion period pertained to distribution capabilities. The branch network retained its primacy almost entirely as the point-of-sale for financial services, with most transactions accomplished by non-branch service channels. This trend was facilitated by the advent of digital communications technologies and networks, which allowed the performance and reliability, required for organization-wide integration of data resources as well as more effective extra-organizational networks. The integration of services around digital networks (ISDN) and greater use of electronic data interchange (EDI) protocols were at the heart of new distribution channels such as electronic fund transfer at point of sale terminals

(EFTPOS), telephone transfer systems and smart cards. Card technology evolved to provide individual customers with border-fewer services, primarily under the member-owned VISA and MasterCard International networks.

New distribution channels allowed banks to supply more services and this had dramatic effects in banks' cost structures. The move from more to less expensive distribution channels was possible because the same information or transaction could be delivered in a number of ways. However, not all substitutes for branch-based service enjoyed immediate success (McNamara and Bromley 1997). Cheaper processes were an insufficient condition for reduced cost structures because technology opened the way for banks to improve their cost structures provided customers and agents changed their behavior according to banks' expectations.

In brief, during the diffusion period IS applications resulted in extending customer options in terms of channel and location in engaging in financial transactions with their main bank but also competing banks. Together with regulatory change and theoretical advances allowing more detailed measurement of credit risk, technological innovations put a premium on financial information rather than on transaction processing capability. Developments in IS were instrumental in lowering entry barriers to bank markets by providing scale benefits to the smallest providers through open membership and third party outsourcing.

3. JUSTIFICATION FOR INFORMATION TECHNOLOGY INVESTMENT

The banking sector has been the biggest user of IS applications for many years. IS applications assist banks through various ways. For example, the introduction of the ATM kiosks and telephone banking technologies enable banks to deliver services at lower cost, largely due to reduction in the number of bank branches and employees. The interpretation of business information (i.e. loan and trading information) and operational risks has become easier with IS. Effective utilization of IS enables banks to process mortgage loan and credit card applications much faster and within days. IS also play a significant role as an intermediary in the phone banking system.

Conventionally, competitive advantage of a bank can be in any form – be it in terms of the size of the bank, capital level, and transaction volume. However similar pattern is not applicable today. Banks that can mobilize IS and creates novelty in their products and services have greater competitive advantage than their competitors. Novelty in product and services helps banks to capture and retain market shares, and increase their profitability. There is a growing pressure for banks to cater new products at faster rate than competitors. This is largely due to the ever changing market environment that requires 'fast, accurate and quality' products and services. Introduction of new products by competitors becomes a major threat to banks – they need to react quickly and maximize utilization of IS to compete. For example, Citibank was the first bank to offer automated telling machinery (ATM) service and developed a strong market position as a technology leader on the back of this process innovation.

Over the years, there has been an increased call to justify IS investment in organizations. Such justification requires utilization of the conventional appraisal tools. However most organizations are not comfortable of using the conventional appraisal tools due to lack of preciseness in definitions of certain key appraisal elements and also inefficiency in providing the expected results (Alshawi et al., 2003). Irani and Love (2001) argued that organizations tend to be prejudice on IS investment, mainly because erroneousness in measuring the benefits of IS investment (due to lack of appropriate measurement framework). Further, organizations often have limited concentration on the 'indirect' costs surrounding IS – which can be a whopping four times higher than the 'direct' cost factors (Hochstrasser, 1999). Ignorance of indirect cost can be fatal to any organizations,

including banks. For instance, suppose a bank places less concentration on training and development of their workers. This will have negative implication to the bank in terms of lower productivity, job efficiency and loss of experienced workers to competitors. In sum, poor justification for IS investment in banks will result in financial losses to banks (which will be translated into loss in competitiveness and/or even jobs).

Alshawi et al., (2000) highlighted that organizations may perceive IS justification as a 'hurdle' that must be overcome rather than as a technique to weigh the cost-benefits of IS investment. Naturally weighing the cost and benefits from IS involves looking at the problems and opportunities brought in by IS. Generally, the benefits of IS includes increased service variety, geographic reach and growth potential, faster response time, improved service quality and cost reduction (Brynjolffson and Hitt, 1996). These benefits have both direct and indirect effect on productivity in the organization.

Ironically, the costs/problems associated with IS are somewhat easier to measure than the benefits (Alshawi et al., 2000). The costs are more tangible since an organization often increases the estimates for costs and decreases the estimates for benefits during the investment decision-making process (Hogbin and Thomas, 1994). Investment in IS poses some form of problems to an organization in terms of hardware and software incompatibility, information overload, and job insecurity feelings among the workers due to the fear that they will be replaced by machines. These problems may have adverse effect on productivity and dampen the growth of other IS applications. The problems pertaining to IS is also related to the management's poor understanding IS cost portfolio. This is because organizations focus is largely on reaping benefits from IS investment and ignores the full cost implications of their investment. In other words, organizations estimates larger benefits and maximum cost savings from their IS investment. This causes the organization to wait additional number of years in order to achieve the expected financial returns from IS utilization. In the end, the organization faces lower productivity and competitiveness due to prolonged use of obsolete technology.

The difficulty in understanding full IS cost portfolio is now a widely acknowledged issue among most organizations. Organizations face severe problem of identifying the complexity associated with IS investment justification. For instance, Kumar (1990) highlighted the difficulty faced by organizations from their enterprise resource planning (ERP) investment. The wide ranging benefits and savings of ERP also pose much controversy for accounting purpose as it remains subjective in nature (intangible). As intangible benefits are difficult to quantify, thus complicates the justification process. This notion was supported by Small and Chen (1995) who argued on the limitations of the conventional accounting techniques to account for the "full" dimension of costs associated with IS. Such limitations raise queries on the "value" of the conventional accounting techniques as well as on the implications associated with the limitations (Irani and Love, 2001).

4. IS UTILIZATION IN ISLAMIC BANKS

Traditional Islamic banks look at technology just as their conventional counterparts do, but often end up with the realization that there is a total paucity of systems catering to the Islamic principles. The early adopters were forced to cobble together systems and build the Islamic banking concepts into their processes in a manner that gave basic automation to allow a slow but painful growth path.

The current state of a highly competitive market with management decision-making stemming from exhaustive management information systems (MIS) and slicing and dicing market data still remains a tall order for the MIS and IS staff who are stretched to provide the basic data required for achieving an increased share of the market. While traditional markets

and clients tend to stay put, the influx of larger marketing budgets to attract newer customer bases is eroding the base of sticky customers.

The bad news is that even the true believer in Islamic banking is skeptical about whether the processes followed are entirely Shariah-compliant. The hope for the Islamic products and Islamic banks offering them, therefore, lies in the introduction of highly flexible banking systems that offer a modular and modern architecture that the multinational and conventional local banks are fast moving to arm themselves with in the battle for customers and their business.

The once-popular and older tandem-based systems that provided a stable and relatively high uptime fault-tolerant environment are being challenged by the need to upgrade and offer web-based interfaces as also the requirement of additional channels to boost transaction volumes. While the security and basic network infrastructure are under fire from a slew of external and internal scrutiny checks, the need to move to a more modern infrastructure is constantly being seen as the answer to quell some of these ongoing challenges (UAE Banking Review, 2005).

The old generation monolithic software vendors, such as Misys, have conventionally tended to offer a tweak to their software that would treat a product with some of the Islamic profit calculations in an Islamic way. While this has been seen as an extremely expensive solution, the banks have worked around the problem by building their own internally developed software that, though considered fairly basic, still managed to solve the immediate problems of being largely compliant. But such effort is a quick fix that tends to live an extended life way beyond what was initially anticipated. The application environment is soon clustered with interfaces intertwined spaghetti-like to various systems, making a nightmare of the maintenance issues that crop up time and again. It is not surprising that many of these banks are looking at new systems that can take care of the much needed features that the internal business groups are clamoring for, but to which the internal application is not able to extend itself.

4.1 Challenges of Islamic Banking Software

Shariah is interpreted differently in most countries and across most regions and sometimes even within the country, depending on their individual Shariah advisor and his interpretation of how a banking product can be offered to the consumer. There are activities such as trade, where the Islamic interpretation can vary, depending on the type of transaction that is being entered into. What often wins the customer is the ability of the bank to appeal to the Islamic beliefs and values of the consumer and the authenticity of the products to be Shariah-compliant.

The lack of standards that define a truly compliant Shariah banking system will affect the ability of the banks to implement Islamic products and services. While various bodies are formed to address the creation of a coherent set of Islamic banking standards, the emergence of a clear standard will clearly aid in creating standardized systems that cater to the larger masses of banks and their customers looking for a truly Islamic bank to deal with, free from fear of any dilution of their belief sets.

4.2 The Evolving IS Application Architecture

The ability to create consumer-based products and services in minimum time is set to be the yardstick for choosing applications meant to automate the banking infrastructure. The banks are looking at state-of-the-art systems to go far beyond automation. They are expecting technology to assist in creating products in a short time, attracting and retaining customers through such tools as CRM-based market feedback, profiles of existing users and data warehouses being created to allow targeted marketing campaigns tailored to the profiles and

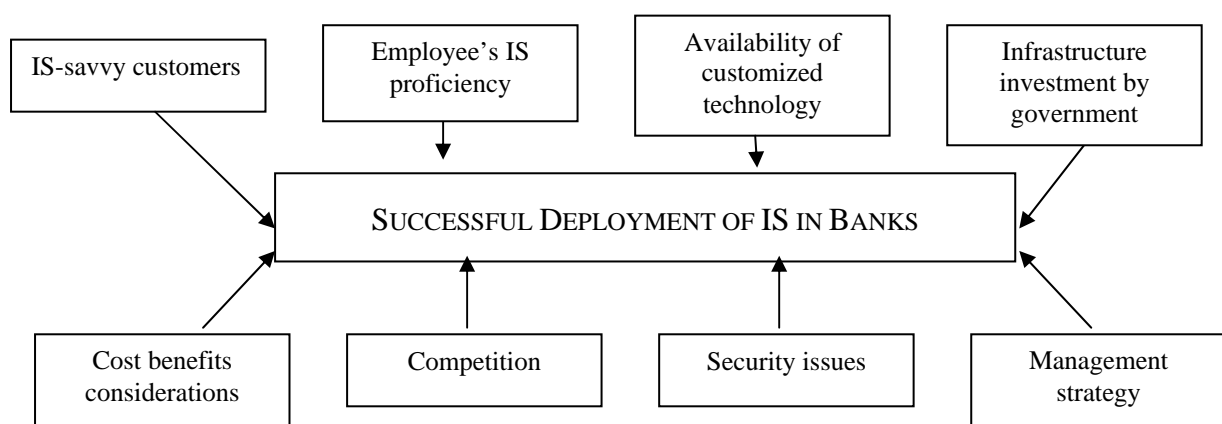
spending habits of customers. The corporate customers are constantly being wooed by competitors and in such highly competitive environment often the extra fizz that a bank can offer makes up the winning mix that creates customer stickiness. Modular architecture is the key - a building block approach is what suits most established as well as new banks. The ability to plug and play will surely emerge as the key. In this task, acquisition of ready-made modern pluggable components that can integrate smoothly will be an important consideration. These applications will either be interfaced directly to the host or will establish connectivity through a middleware. The modular components have to take care of products such as:

- Al Wadiah Savings Account
- Al Wadiah Current Account
- Al Mudharabah Investment Account
- Islamic Financing
- Al Ijarah / Ijarah Wa Iqtina Leasing
- Islamic Trade Financing
- Islamic Treasury
- Al Mudharabah & Al Musyarakah Equity Financing
- General Ledger
- Customer Information
- Remittances
- Telebanking
- Internet Banking
- E-Switch (ATM)

5. STRATEGIES TO ENHANCE THE VALUE

Successful deployment of IS in Islamic banking institutions is dependent on eight major factors: IS-savvy customer, employee's IS proficiency, availability of customized technology, infrastructure investment by government, cost-benefits considerations, competition, security, and management strategy. Figure 1 shows the critical success factors that drives IS deployment in Islamic banks.

Figure 1: Success Factors Driving IS Deployment in Islamic Banks



In today's IS enabled world, where customer loyalty can shift in an instant with the click of a button, banks must become informed of the role and interplay between the different dimensions that make a difference between success and failure. They need to understand how

these factors affect their immediate business environments, and how to manage them in order to compete successfully in fast changing world. These key areas are explained in detail below.

5.1 IS-Savvy Customers

IS-savvy customers refers to the consumer's understanding and acceptance of IS based banking from the perspective of the purchaser of the services the bank offers, including the range of possible transactions. Although the statistics on increasing web traffic appear to indicate that visitors to websites are attracted by the anytime, anywhere convenience of IS based banking, the cost and time savings resulting from a decrease in travel as well as the instantaneous feedback, this increase in visitor traffic is not matched by a corresponding increase in Internet based transactions. Despite the increase in online visitors and use of the website, just a mere tenth of households have used the Internet for their financial transactions.

5.2 Employee's IS Proficiency

Well-trained employees who are able to understand IS based systems and customize them for specific needs and troubleshoot the problems that arise are vital to ensure smooth, uninterrupted services to customers. Consumers may not be aware of the technical details and the amount of work that such employees put in when the IS based banking system runs flawlessly. However, system that works poorly, as a result of limited technical expertise amongst the staff, quickly catches the attention of customers who will simply move on to a competitor. As such, banks that deal with IS based transactions must invest well in maintaining and upgrading technical expertise, including providing avenues for continuously upgrading the skills of their workforce to keep abreast of advances in technology.

5.3 Availability of Customized Technology

The technology here refers to several dimensions. One is the use of current technology incorporating the latest advances. The spate of mergers and acquisitions of the nineties have left many banks with outdated systems. The choice of new replacement technology is made difficult by the fact that the new systems on the market are not yet proven and mistakes could be very costly. Another dimension is adapting current technology to fulfill a customer demand that has traditionally been met by conventional brick and mortar concerns and smiling, human faces. To harness the power of IS in meeting consumer demand, it is vital to consider the new methods of providing established products. It is also vital to customize technology so it delivers the products according to the needs of both customers and banks, to both differentiate from competitors and create a brand name in a bank's selected strategic niches. While the correct choice of technology will provide the rewards of improved efficiency and new markets, errors can result in debilitating loss of business and market share. Banks should choose technology that effectively supports their business strategies, including their particular objectives. This focus on effectively delivering their strategic products and maintaining strategic market position is more important than just zeroing in on the capabilities of alternative technologies or all of the competitors products.

5.4 Infrastructure Investment

Generally, banks in developed countries are better prepared to take advantage of IS due to availability of adequate infrastructure to support diffusion of IS. Availability of IS infrastructure is a significant determinant of profitability of banks, especially in Islamic countries. Provision of pertinent IS facilities and continuous upgrading of IS infrastructure will induce growth.

5.5 Cost-benefit Considerations

The fifth important factor is related to the cost-benefits considerations of IS investment. The failure of banks that has spent huge sums on IS but does not reap benefits serves as a reminder of the cost-benefits considerations that serve as a cornerstone of successful strategic planning. For example, although banks are addressing the growing demand for Internet banking by providing for expenses related to IS based banking in their budgets, an important consideration is whether the resulting benefits exceed this expenditure. Part of these benefits are maintaining a strong brand name, creating an image that promotes the perception of a sophisticated, cutting edge bank that is comparable to the best in the world.

While this perception helps to retain existing clientele, particularly larger customers, a greater consideration for true success comes from matching expenditure on IS systems with the bank's strategic objectives. To truly maximize the benefits of IS based expenditure, banks should pursue holistic strategic investments that consider the gamut of interrelated factors that comprise the bank's business environment, such as organization, processes and technology so that a particular strength in a certain area would not be underutilized due to weaknesses in other areas. For example, if a bank that has installed the best technology in the industry does not have a process in place that allows transactions to flow smoothly and its employees have not been trained to use the system correctly, then this technological superiority will not translate into a marketplace advantage, and the bank will lose out to competitors have better processes in place.

5.6 Competition

Unlike brand names and other proprietary assets, identical IS facilities can be purchased by anyone at any time. Over the years, the cost of powerful IS systems has dropped tremendously, making sophisticated technology extremely affordable. This allows small and large competitors to have access to similar systems – hence increased business competition. Since competition in the banking sector is very high, retaining loyal customers has become a major challenge. To retain customers over the long term, banks must offer strategic and competitive value added products to stand out from the competition. It is important for banks to understand the needs of customers and design cyber products that are able to meet and exceed customer expectations to become effective players in the cyber banking industry. Indeed, the technology for satisfying the different needs of customers is available, and the extent and variety of services that can be designed are practically unlimited.

5.7 Resolving Security Concerns

One of the pertinent issues that concerns banks in most countries is concerned with security. Generally, customers are always doubtful of the online banking system, mainly due to privacy of information issue. Customers fear that their information will be 'stolen' by ingenious hackers for illegal purposes. Banks are required to proactively construct and implement their own security measures with the aim of improving consumer confidence, retaining and attracting customers. Islamic banks could voluntary choose to inform customers the bank's privacy policy, shedding light on what information can be revealed to whom and for what purpose, and provide a contact person in case the customer has queries. When potential customers are confident that a particular bank will maintain the security of their personal details and the integrity of their transactions, they will become more comfortable using the bank's online banking facilities.

5.8 Management Strategy

Success in IS banking requires careful, long-term development plans that comprise a strategic roadmap backed by visionary management. Generally, the management of banks should

envisage business growth backed by IS and implement relevant strategies to achieve such vision. Kalakota and Robinson (1999, p. 197) offer a value proposition for IS based businesses: "Give customers what they want, when and how they want it, at the lowest cost". While this proposition is applicable to both IS based and conventional businesses, the trick in the IS based businesses is figuring out how to provide the services demanded at acceptable cost. In this context, the best strategy for banks is to consider a holistic product-package that constitutes product creation, delivery and distribution scheme based on IS applications.

Kalakota and Robinson (1999) highlighted a three-pronged strategic approach for banks business growth. The first approach is called as the 'knowledge building' step. This consists of understanding the customer (inclusive of their value to the business) and industry needs. The second step is called as 'capability evaluation', which looks at existing capability within the bank and assesses what needs to be done to be able to meet customers' needs, particularly in areas that provide value to the customers. Finally, the IS based 'business design' step considers the various ways of packaging the products and services that customers demand so they can be delivered efficiently using IS. By paying attention to both customer needs and technological capabilities at an early stage, and assembling and deploying an IS based business system that is crafted around the processes designed to satisfy customer needs, banks can construct a nimble, cost effective IS system that provides a competitive advantage in the marketplace.

The formulation of workable strategies must be supported by effective implementation of strategic plans. No matter how good a strategy is, it is bound to fail if it is poorly executed. Thus, banks must ensure that well qualified staff with good track records are managing these strategic thrusts and establish continuous feedback mechanisms. Thus the projects can be effectively monitored and any missteps in execution can be corrected quickly, before costly, irreparable damage occurs.

6. CONCLUSIONS

In sum, the role of IS in value creation for firms has long been a favorite research topic among scholars. For the Islamic banking institutions, change is a foot in the land of global finance, driven largely by rapid technological advances. In this paper, several suggestions have been made on how Islamic banks can maximize their return from IS investment. The main suggestions are focused towards eight critical success factors, including retention of IS-savvy customer, increasing employee's IS proficiency, ensuring availability of customized technology, proper infrastructure investment, cost-benefits considerations, competition, security, and management strategy. Whilst these factors are rather comprehensive, the authors do wish to acknowledge that there is possibility for other equally important factors which are not captured in this paper.

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