IT Investment Allocation in Japanese Banking Industry

by

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Abstract

In this study, we investigate and discuss IT investment and related issues in the Japanese banking industry. And we insist that banks should take account of technology trend as one of heavy IT users and switch long-term strategy and IT-migration-strategy appropriately in order to make the best of IT.

First of all, we show some backgrounds of Japanese banking industry and IT revolution. Next, we show three case studies of a Japanese bank. We will find that, over the last ten years, Japanese banks have been struggling with deregulation, the IT revolution and the long resection of the Japanese economy. These external changes have made corporate strategies and traditional information systems are obsolete and inefficient.

After then, we analyze IT investment allocation issues in the banking industry. As summary of our analysis, we show some key success factors and recommendation to a Japanese bank.

Finally, Japanese banks should always consider Long-Term Strategy with a long-time viewpoint: during the period of IT migration, they should find a path in which they should follow based on IT Migration Strategy.
Acknowledgments

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# CHAPTER 1 INTRODUCTION

# CHAPTER 2 BACKGROUND OF THE JAPANESE BANKING INDUSTRY

2.1 Structure of the Japanese Financial Industry

2.2 Structure of the Banking Industry

2.3 Financial Holding Companies

2.4 Summary

# CHAPTER 3 IT INVESTMENT AND REVOLUTION IN THE JAPANESE BANKING INDUSTRY

3.1 First Generation: Automation & Cost Reduction in the 1960's

3.2 Second Generation: Enhancement & Online Connection in the 1970's

3.3 Third Generation: Reconstruction & Additional Functions in the 1980's

3.4 After Third Generation to Middle 1995

3.5 New Technology in 1995: The Internet

3.6 Issues in 1995

# CHAPTER 4 CASE STUDIES OF IT INVESTMENT IN A JAPANESE BANK

4.1 Case 1: Transformation from Legacy Technology to New Technology

4.2 Case 2: MI Project

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1</td>
<td>Before 1995 – Investment to Mainframe System</td>
</tr>
<tr>
<td>4.1.2</td>
<td>From 1996-1997: Mainframe System Integration Project</td>
</tr>
<tr>
<td>4.1.3</td>
<td>Issues in 1997</td>
</tr>
<tr>
<td>4.1.4</td>
<td>IT Investment from 1998</td>
</tr>
<tr>
<td>4.1.5</td>
<td>Summary of Case 1</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Market Risk Management System Developing Task Force</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Issues from Task Force</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Common System Infrastructure Development Project</td>
</tr>
<tr>
<td>4.2.4</td>
<td>Scope of MI Project Team</td>
</tr>
<tr>
<td>4.2.5</td>
<td>Research of Potential Needs</td>
</tr>
<tr>
<td>4.2.6</td>
<td>Appropriate Information Technology</td>
</tr>
<tr>
<td>4.2.7</td>
<td>Standardization Policy</td>
</tr>
<tr>
<td>4.2.8</td>
<td>Out Sourcing &amp; Project Management</td>
</tr>
</tbody>
</table>
Chapter 1 Introduction

In this study, we investigate and discuss IT investment and related issues in the Japanese banking industry. Over the last ten years, Japanese banks have been struggling with deregulation, the IT revolution and a long re-sectioning of the Japanese economy. These external changes have made banking strategies and traditional information systems obsolete and inefficient.

Deregulation and new information technologies, such as the Internet, have provided banks not only additional cost reduction opportunities, but also new business opportunities. It is the first chance for Japanese banks to seek new businesses with information technologies. They should reconsider their corporate strategies and information systems to encourage seeking these new businesses.

Open system architecture, which evolved from the IT revolution, provides a lot of selection for software, hardware and platform architecture. New architectures are far more flexible than mainframe architectures. An appropriate combination of them works well and supports corporate strategy, but inappropriate combinations may cause system development projects to fail. Banks could lose a lot of money and new business opportunities. They should carefully choose technologies when designing their system.

In addition, traditional organization and IT capabilities will not be optimal because they are designed to fit with traditional strategies and information technologies. Banks need to adjust organization and IT capabilities, and restrict internal capabilities in order to seek new business opportunities and to develop information systems under new technologies.

For those reasons, it is not enough to just invest large amounts of money in information technology. It is necessary to run back over their strategy, and adjust information systems and IT capabilities to fit their new strategy. In this
context, the allocation of IT investment and internal capabilities become very important decisions from both a strategic and technological point of view. This is the primary reason why we chose this topic.

Through our study, we try to find out key success factors for IT investment in the case of Japanese banks. For example, in which areas should banks invest, which technologies and architectures should banks choose and how should banks adjust organization and human resources.

In Chapter 2, we introduce the background of the Japanese banking industry. The Japanese banking industry has been highly restricted for a long time. Deregulation and a long re-sectioning of the Japanese economy after the 1990’s have pushed Japanese banks into a new competitive stage, and we will investigate their efforts to survive.

In Chapter 3, we describe the history of IT investment in the Japanese banking industry. From 1960, Japanese banks aggressively have invested in IT in order to seek operation effectiveness. They built highly integrated mainframe systems and spread ATM networks across Japan. They established a System Development Division and accumulated system development capabilities within it. They increased focus on maintainability after initial development projects and trained employees to take charge of cording and testing. We, however, find that those investments not only in IT itself, but also in related capabilities, became obstacles to transitioning to new technologies and brought up various issues.

After that, we explore three success case studies for Japanese banks. The first case describes how to make the transition from legacy technology to new technology and demonstrates the importance of leadership in top management. The next case shows the efforts of a successful project team. In particular, it emphasizes that choice of appropriate architecture and standardization of developing process will be the key success factors. In the final case, we see how one bank responded to new business opportunities provided by web technologies.
We find that the bank created new divisions with R&D and business development functions in order to encourage seeking new business opportunities and crossing over from legacy technology to new technology.

In Chapter 5, we discuss these three cases based on frameworks and methodologies from recent studies. First of all, we study the relationship between corporate strategy and IT. We find that Michel Porter’s recent study serves as a good guide for late analysis. Next, we consider how to allocate IT investment within a framework as proposed by Ross, et al. After that, we discuss appropriate system architecture and the multi-platform architecture chosen by Bank of Tokyo-Mitsubishi. In addition, human resource issues are discussed in this chapter. We consider R&D and business development functions in banks, outsourcing and project management. In summarizing this chapter, we pick up on some key success factors from this analysis. At the same time, we make certain recommendations for banks to leverage their IT investments.

Finally, we conclude this study in Chapter 6: we categorize key success factors into Long-Term Strategy and IT Migration Strategy. And we insist that Japanese banks should always consider Long-Term Strategy with a long-time viewpoint; during the period of IT migration, they should find a path in which they should follow based on IT Migration Strategy.
Chapter 2 Background of the Japanese Banking Industry

2.1 Structure of the Japanese Financial Industry
The Japanese financial industry was highly regulated by the former Ministry of Finance (MOF), which became the Financial Service Agency in 1998, and there were three distinguishable sub-industries within it. Those were banking, security, and insurance, and they were completely separated by firewalls. Therefore, no individual firm could operate in more than two sub-industries. There was no competition among the three sub-industries, and competition within each sub-industry was not fierce. Each firm competed under the same rules of each sub-industry, and there was no new entry and no bankruptcy until the 1980’s. In other words, the whole financial industry was in very stable condition.

After 1975, deregulation started gradually. At first, banks, security companies and insurance companies were authorized to sell or buy limited products to customers at their counter and to operate limited products at wholesale market. However, they were never authorized to enter other sub-industries until 2000.

After 1990, the bubble economy in Japan collapsed and the Japanese economy fell into a long recession. In this recession, many structural problems of the financial industry, such as over-loans from banks and turnover-dependent revenue structures of security companies, became clear and some financial firms bankrupted in the 1990’s. The Japanese government has since been in a dilemma over the pace of deregulation. They have thought that they should speed up deregulation to resolve financial structural problems and to recover from the recession. On the other hand, they have been afraid of an economic crisis that might be brought out by unstable financial system. They have made continuous efforts both to maintain a stable financial system and to push deregulation.
➢ **Banking Industry**
Under moderate competition and non-bankruptcy policy, there have been many banks in this industry. There are some distinctive categories in this industry based on regulation. But these categories are cleared with deregulation and have started to compete in same market. They are encouraged to merge with the banking industry. Details will be mentioned in the next section.

➢ **Security Industry**
Before 1990, security firms were roughly grouped into three classes according to their size: 4 large firms, 17 mid-sized firms and over 100 small firms. Although there had been many firms from large size to small size, the 4 large firms—Nomura, Daiwa, Nikko and Yamaichi—had dominated this industry. They had held more than 50% of brokerage shares continually. They also historically had some investment banking functions. On the other hand, the other mid-size & small firms had only served as brokers. In those days, this industry was very stable, like other financial sub-industries.
But after 1990, they suffered low profitability. Their revenue structure was highly dependent on brokerage fees, but the stock market in Japan had low turnover, and new entrants, like online brokers, discounted their brokerage fee under deregulation of brokerage fees. Some firms bankrupted and some firms merged with each other. In fact, Yamaichi, one of the “Big 4”, could not survive this severe competition and went bankrupt in 1998.

➢ **Insurance Industry**
Prior to 1996, the insurance industry was classified into the life insurance industry and the accident insurance industry. Foreign insurance companies had never been authorized to enter both industries. Both industries had been dominated by a few large firms. But many small firms, including about 40 life insurance firms and about 30 accident insurance firms, were able to survive in niche segments.
Since 1996, The MOF has permitted both life insurance firms and accident
insurance firms to operate in each market mutually. Some life insurance firms founded accident insurance firms as subsidiaries and vice versa. And some life insurance firms made alliances with accident insurance firms and vice versa. At the same time, the MOF has given permission to foreign insurance firms to operate in Japan. Some foreign firms have started to sell accident insurance over the Internet. They have introduced new pricing policies, in which they analyze the risk of insurance in detail. By this pricing policy, many people have been able to save their insurance. Some foreign firms have implemented their business using their own business model, such as Life Planner of Prudential, and all foreign firms received about 10% of contract amount shares in Japan by 2000.

In conclusion, the insurance industry is now in a very competitive situation. Seven life insurance firms and one accident insurance firm had gone bankrupt by 2001, and some firms have made alliances with firms in internal and other sub-industries.

2.2 Structure of the Banking Industry

Traditionally, the banking industry was strictly regulated by the former Ministry of Finance accompanied with another sub-industry. Japanese banking firms had been classified into 3 categories: ordinary banks, trust banks, and long-term credit banks.

- **Ordinary banks**
  These correspond with commercial banks in the U.S., but some big banks also have a kind of investment banking function. They are roughly classified into two categories: city banks and local banks by geographical location.
  City banks operate not only all over Japan, but also internationally. Their head offices are either in Tokyo or Osaka, the two largest cities in Japan and their target segments are all the individual and large corporations in Japan. Whereas there were 13 city banks in 1989, they have since been integrated into 5 financial groups.
  Local banks operate in limited regions and their head offices are generally in
central cities of each region. Their target segments are personal and small companies within the region. They provide similar products and services as city banks, except those of investment banking. Several local banks can operate in same region. And recently, city banks have entered this segment aggressively. Therefore, competition in each region has become very fierce, causing many banks to go out of business and other banks merged with each other. Whereas there were 129 local banks in 1997, there are 121 banks at 2001.

In addition, online-only banks are categorized as ordinary banks. Basically, they provide the same functions on their web site as city banks and local banks. They have only web sites and some ATMs, but no branches. Japan Net Bank was the first online-only bank, founded in 1997 by Sumitomo-Mitsui Bank as a subsidiary. Since then, three other online-only banks have been founded. Deregulation enables firms in other industries to fund new banks. This has enable companies such as Sony, a famous Japanese high-tech company, to found Sony bank and Ito-Yokado, a Japanese retailer and parent company of Seven Eleven Japan, to found IY Bank. They are still small and not profitable, but they have been able to expand their customer base and asset volume by making the most of their parent firms’ cooperation.

- **Trust banks**

   These banks have two functions: trust company function and banking function. They operate all over the country have head offices in either Tokyo and Osaka like city banks, but the average trust bank has about one fifth the number of branches and assets compared to city banks. In terms of banking business, they have focused on getting long-term deposits and providing long-term loans to companies. But their banking business is gradually becoming similar to that of commercial banks due to deregulation. There were seven trust banks by 2000, but there two have merged, leaving five trust banks in 2003.

- **Long-term credit banks**

   The main role of these banks was to efficiently provide stable, long-term loans to heavy industry and other industries which the Japanese government considered important for Japanese economic growth, and they were authorized
to issue five year bonds, not deposits, for both individuals and companies, including other banks, as much as needed. They also had investment banking functions to support these industries.

They operated in some other countries, and their head offices were in Tokyo like city banks, but each bank had only about thirty branches, about one tenth compared to the average city bank.

But their role was finished in 1980’s with end of Japanese rapid economy growth and they started to compete with city banks. But this competition was very difficult for them. There were three banks originally, but two of three bankrupted in late 1990’s, and the last one merged with two city banks in 2002. This sub-category has now completely disappeared.

2.3 Financial Holding Companies

In 2001, legislators changed laws and permitted banking firms, security firms and insurance firms to establish financial holding companies. This was the final step in the deregulation of the financial industry.

Few large firms in the banking, security and insurance industries are trying to establish financial holding companies as extra sub-industries. On the other hand, many small firms have established financial holding companies within their respective sub-industries. But it is on the way at 2003.

In this section, I will describe the details of four large financial holding groups established by traditional banks.

Large city banks have been most aggressive in establishing financial holding companies in the financial industry. They aim to establish total financial service groups. By 2003, they were integrated into four large financial groups: Mizuho Holdings, Sumitomo Mitsui Financial Group, Mitsubishi Tokyo Financial Group and UFJ Holdings.

On the other hand, three mid-size city banks established Resone Holdings, and they have provided full banking services all over the country and to some international businesses. But their strategy is different from the big four
financial groups, because they focus their business on regional segments, which have been covered by local banks. Therefore, they have established a holding company as a simple organization of each regional oriented banking subsidiary.

The big four financial groups aim to be full financial service providers, like the aforementioned Citibank Groups. Therefore, they are accompanied with trust banks and long-term credit banks and they acquire mid-size security firms. (see Table 1.1). The traditional sub-categories in the banking industry have become obscured. However, these groups have been unable to acquire or make alliances with insurance firms since 1997, and large security firms still remain in their own industry. After 2003, the leaders in the security and insurance industries may take some action in order to expand their business within the whole financial industry.

Table 2.1 Financial Holding Companies in 2003

<table>
<thead>
<tr>
<th>City Bank at 1988</th>
<th>Financial Holding Company at 2003</th>
<th>Trust Bank &amp; Long-Term Credit Bank at 1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daiichi Kangyo Bank</td>
<td>Mizuho Holdings</td>
<td>Industrial Bank of Japan</td>
</tr>
<tr>
<td>Fuji Bank</td>
<td>Sumitomo-Mitsui Financial Corporation</td>
<td>Yasuda Trust Bank</td>
</tr>
<tr>
<td>Sumitomo Bank</td>
<td>Mitsubishi Tokyo Financial Group</td>
<td>Mitsubishi Trust Bank</td>
</tr>
<tr>
<td>Mitsui Bank</td>
<td></td>
<td>Nippon Trust Bank</td>
</tr>
<tr>
<td>Taiyo Kobe Bank</td>
<td>UFJ Holdings</td>
<td>Toyo Trust Bank</td>
</tr>
<tr>
<td>Mitsubishi Bank</td>
<td>Resona Holdings</td>
<td></td>
</tr>
<tr>
<td>Bank of Tokyo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanwa Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tokai Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saitama Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kyowa Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daiwa Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hokkaido Takushoku Bank</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Bunklupty)

Source: Japanese Bankers Association, 2003
In 1999, two city banks and one long-term credit bank jointly established a bank holding company and three banks became subsidiaries of the holding company. In 2002, under Mizuho Holdings, the three banks were consolidated and reorganized into Mizuho Bank, whose customer base consists primarily of individuals and domestic firms and has commercial banking functions, and Mizuho Corporate Bank, which primarily serves large corporations and has investment banking functions. At the same time, Yasuda Trust Bank joined this financial group as Mizuho Trust Bank and three mid-size security firms were consolidated one security firm named Mizuho Security.
In 2001, Sumitomo Bank and Sakura Bank, which was the former Mitsui Bank and Taiyo Kobe Bank, merged into the Sumitomo Mitsui Banking Corporation. They did not establish a holding company at that time, but the Sumitomo Mitsui Banking Corporation established the Sumitomo Mitsui Financial Group (SMFG) in late 2002 in order to prepare for future expansion.

On the other hand, SMFG is interested in forming alliances with other firms. For example, SMFG and Daiwa securities, the Japanese number two security firm, established Daiwa SNBG Securities in 2001. Daiwa Securities translated their investment banking business to this new security firm. In addition, the former Sakura Bank founded Japan Net Bank (JNB) as its subsidiary in 1998. JNB was established as the first online-only bank and is the most successful online only-bank in Japan. SMFG also has a major share in JNB, but Fujitsu, a Japanese high-tech company, holds 20% those shares, too.
In 1997, Mitsubishi Bank and Bank of Tokyo merged and new bank was named Bank of Tokyo-Mitsubishi. (BTM) And in 2001, Bank of Tokyo-Mitsubishi, Mitsubishi Trust & Banking Corp., and Nippon Trust Bank, which was a subsidiary of Bank of Tokyo-Mitsubishi, jointly established a bank holding company called Mitsubishi Tokyo Financial Group. In 2002, Mitsubishi Trust & Banking Corp. merged with Nippon Trust Bank under Mitsubishi Tokyo Financial Group. (MTFG)

In 2003, Mitsubishi Tokyo Financial Group acquired Kokusai Securities, which was fourth-largest securities company at the time and reorganized Mitsubishi Securities as one of MTFG’s subsidiaries.
In 2001, Sanwa Bank, Tokai Bank, and the Toyo Trust and Banking Co. jointly established a financial holding company called UFJ Holdings Inc., under which Sanwa Bank and Tokai Bank merged. Sanwa Securities and Tokai Securities, subsidiaries of each bank and mid-size security firms, merged under UFJ Holdings and became UFJ Security.

The UFJ Group then made alliances with three mid-size insurance firms under the name of Financial One. This alliance also includes one credit card firm and a non-bank firm. The basic idea is to provide financial one-stop shopping service in the future, but there have been no obvious results going into 2003.
2.4 Summary
In this chapter, we described the background of the Japanese banking industry from 1990’s until now. Deregulation after long, strict regulation era changed the rules of competition in the banking industry. A similar revolution was brought about in the financial industry, as well. As of 2003, this revolution is well under way, and we can summarize the trend of changes as follows:

- Deregulation removed firewalls which divided the banking industry into three sub industries: ordinary banks, trust banks and long-term credit banks. In this process, these banks gradually lost their differentiating factors and took after each other. They started to compete with each other in this new market. The competition with little differentiation in this new market has been very fierce.

- Deregulation and severe competition in the banking industry encouraged mergers and acquisitions between various players. They thought that they should merge, become big and make the most of economy of scale to survive.

- Some banks bankrupted in this severe competition and the long Japanese recession. The 1996 bankruptcy of Hokkaido Takushoku Bank, one of the city banks, meant that the authorities had changed the basic policy under which no bank could go bankrupt, and made every one realize that the rules of competition had changed.

- Deregulation tempted new entries into the banking industry from other industries. In addition, internet technology lowered the entry costs to the banking industry. By 2003, 4 online-only banks had been funded, but they have not been as successful as online brokers and are still struggling with low profitability.

- Opening up of financial holding companies in 2001 by the authorities encouraged integration not only between banks but also between security
firms. These are integrated into four large financial groups. But these movements for integration are still on the way in 2003. Some of the four large financial groups will integrate insurance firms, because they aim to provide a total financial service as a group. On the other hand, a few traditional leading companies of the security and insurance industries may establish more large financial groups.

- Deregulation encourages globalization. Some large and mid-size firms of the three sub-industries belong to foreign large financial group and some were taken over. They brought about new competitive rules in Japan and changed the norm of the financial industry, too.
Chapter 3 IT Investment and Revolution in the Japanese Banking Industry

In this chapter, we describe IT investment in the Japanese city banks, which are integrated into some financial holding companies now.

To begin with, we show IT investment history from the 1960’s to the 1990’s. Over these thirty years, all city banks focused investments on mainframe systems, which were highly integrated into their own banks. Their developments were roughly categorized into three distinct generations according to the period and function. We describe the characteristics of each generation and then mention the changes which city banks faced in the early 1990’s. We will find they invested in similar mainframe architectures and faced similar problems in 1990’s.

Next, we discuss some issues in the mid 1990’s. We describe how the Internet promptly penetrated Japan in this period, how information systems developed by city banks brought up issues, and how city banks struggled to transition from legacy mainframe technologies to new technologies like the Internet.

Finally, we summarize some issues from 1995 in the conclusion of this chapter.

3.1 First Generation: Automation & Cost Reduction in the 1960’s

In the 1960’s, computer systems were introduced by city banks for the first time in order to rationalize back-office operations by automated bookkeeping and interest calculations. In those days, city banks had many transactions in accord with Japanese prompt economic growth, and computer systems were very helpful tools in operating a lot of simple and limited kinds of transactions with low cost. Application software was developed operation by operation and there was non-linkage between the application software.
Figure 3.1 shows an example of the first generation system concept.

**Figure 3.1 Main Concept of Mitsubishi Bank First Generation System**

3.2 Second Generation: Enhancement & Online Connection in the 1970’s

In the 1970’s, banks enhanced their first generation systems. These enhancements included two significant functions. One was the integration of application software and the other was the introduction of cash dispensers (CD) and automatic teller machines (ATM).

The integration of application software was an improvement on the first generation system. In the first generation system, each operation, such as deposit and loan, was independent of each other. Therefore, all city banks focused on integrating each of the independent application software in order to realize additional cost reduction affected by computer systems.

The introduction of CD and ATM was a trial for Japanese banks. At first, they built online networks in each bank and then connected them with the networks...
of the other city banks. Later, most regional banks followed suit and connected to that network. Therefore, customers with a CD card from a particular bank could make deposits, withdrawals and inquiries on their account from the CDs of any bank connected to their system via this online network. Figure 3.2 shows an example of the second generation system concept.

**Figure 3.2 Main Concept of Mitsubishi Bank Second Generation System**

Source: Author
3.3 Third Generation: Reconstruction & Additional Functions in the 1980's

In the early 1980’s, it became obvious that the capacity of the second generation system as a whole was getting close to its limitation. In those days, customers and transactions were dramatically increasing. At the same time, globalization and deregulation required new functions from the system. Therefore, each city bank decided to develop an entirely new online banking system.

Prior to the second generation system, all banks focused on cost reduction by putting into effect back office automation and online connections with other banks. As a result, the second generation systems of city banks provided similar functions and had similar architecture.

In the third generation system planning, however, their focus were slightly differentiated from each other and depended on their corporate strategy. Figure 3.3 shows an example of the third generation system concept.

In 1980's, Japanese banks spread CDs and ATMs all over the country. It became clear that the ATM network of Japanese banks had been consistently superior to that of U.S. banks. If we compare the landmass of the two countries, we can easily imagine the high concentration of ATMs in the relatively small Japanese land area.

Generally, we can summarize the four main objectives of the third generation systems as follows:

- Restructuring of back office systems
- Introduction of management information systems
- Improvement of external connection functions
- Introduction of new needs by security operations and globalization which were brought about by deregulation
Figure 3.3 Main Concept of Mitsubishi Bank Third Generation System

- ATM ALLIANCE NETWORK
- INTER BANK CLEARANCE SYSTEM
- INTERNATIONAL MONEY TRANSFER NETWORK
- HOOKUP SYSTEM
- DEPOSIT SYSTEM
- DEPOSIT MONEY TRANSFER SYSTEM
- LOAN SYSTEM
- FOREIGN EXCHANGE SYSTEM
- FOREIGN MONEY TRANSFER SYSTEM
- MANAGIRIAL INFORMATION SYSTEM
- MANAGIRIAL INFORMATION (PAPER)
- ON-LINE TERMINAL
- BRANCH TERMINAL
- ATM TERMINAL

Source: Author
Each bank invested from ¥8 billion to ¥10 billion in their third generation system projects. It was a very big investment for a city bank in those days and it was said that the banking industry entered into a plant industry. In the process of developing third generation system projects, city banks gradually accumulated capabilities in IT.

 ➢ Organization

All banks centralized their system developing functions in relation to their highly integrated mainframe system characteristics. All city banks had a System Developing Division, or a division corresponding to it, in their organization and each business unit requested improvements on existing functions and development of new functions.
Human Resource
All banks allocated more than 100 employees to develop and maintain their systems and assigned them planning, designing, cording and testing tasks. Of course, all city banks outsourced highly complicated planning processes and simple cording and testing processes to specialists of third-party software vendors. But top management thought that they should not outsource all their processes to third-party vendors and should keep some knowledge in order to be able to maintain and improve the system after the completion of the initial project. Most employees of System Development Division were posted from other jobs and had no technical background. In those days, it was difficult in Japan to employ the right person from outside the company. Therefore, System Development Division also had an educational function and was encouraged to attend external education programs about technology and project management. Despite their efforts, however, the motivation among employees in System Development Division was very low.

Standardization of Developing Processes
Highly integrated system architecture encouraged a highly standardized developing process. Not only were planning, designing, cording and testing processes standardized, but also education and labor management. It would be reasonable at the point of effectiveness and risk management. On firm wide architecture, standardized system designer, coder and so on was reasonable to make the most of efficiency. And cording standards would minimize personal dependency risk and keep maintainability. In addition, standardized education processes and labor management supported the standardization of developing processes.
Figure 3.5 Example of Organization Structure (Mitsubishi Bank at 1989) 

Figure 3.6 Expansion of Japanese Banks’ Mainframe System

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>Deposit Online Service started</td>
</tr>
<tr>
<td>1971</td>
<td>Cash Dispenser service started</td>
</tr>
<tr>
<td>1972</td>
<td>Inter bank clearance service started</td>
</tr>
<tr>
<td>1977</td>
<td>ATM service started</td>
</tr>
<tr>
<td>1980</td>
<td>ATM alliance service started</td>
</tr>
<tr>
<td>1981</td>
<td>Japanese banks joined international money transfer network service (SWIFT)</td>
</tr>
<tr>
<td>1981</td>
<td>Telephone Banking service started</td>
</tr>
<tr>
<td>1983</td>
<td>Firm Banking service started</td>
</tr>
</tbody>
</table>

Source: Author

3.4 After Third Generation to middle 1995

After 1995, each bank continuously worked to improve third generation systems. System Developing Divisions were fully organized to improve and maintain the third generation system, but there were no more big projects like the third generation system project.

One reason was that cost reduction effects are fully achieved in this architecture and the other reason was that not all banks had enough in their budgets for IT investment. As mentioned in chapter 2, all banks had suffered from the long recession in Japan following the collapse of the bubble economy. They had to spend a lot of money to write off bad debt accumulated during the bubble era.

On the other hand, there were two potential needs which were not covered by this continuous system development. One was the demand for dealing and
trading support systems requested by capital market dealers, foreign currency dealers and derivative products dealers. The other was the demand of back office support systems from the back offices of capital market products and some global operations, like custody services and international fund transfers.

These requests included requests for various systems. For example, foreign currency dealers had a demand for high response support system. Derivative product dealers had demands for short calculation time and flexibility for explanation. And global custody operators had a demand for international connectivity.

System Developing Division, however, thought that it was difficult to satisfy the potential demands on mainframe architecture. Therefore, support systems were developed on a UNIX based claimant-server architecture, which were a new and widespread information technology in those days.

In addition, most of the developing project teams were organized into individual business units. In those days, end-user computing policy was encouraged, and each business unit planned and designed cooperatively with the third-party software vendor which they chose and relied on them for programming and testing. Some project teams were initiated by the System Developing Division, but coding and basic testing was not done in-house.

In those days, the System Developing Division concentrated their organization, human resources and culture to fit with developing and maintaining mainframe systems and considered jobs like client-server architecture based projects to be side business for them.
3.5 New technology in 1995: The Internet
The Internet started to explode in the U.S. from 1995. (See Figure 3.5) Security First Network Bank (SNFB) started the first internet banking services in 1995. SNFB was established as an on-line only bank and did not have physical branches. Soon after, some traditional banks opened their first websites. Wells Fargo opened its site in 1995 and, Bank of America followed in 1996. Some U.S. banks thought that the Internet would be a new channel and changed their business processes to accommodate on-line services.

Figure 3.7 Penetration of the Internet in Japan and U.S.  

Source: 2002 WHITE PAPER Information and Communications in Japan, Ministry of Public Management, Home Affairs, Posts and Telecommunications
In actuality, the Internet provides the most effective channel to banks. Figure 3.6 shows transaction costs of each channel. The Internet is most effective channel among them. In addition, the Internet channel has possibilities to spread wider than PC banking channels, because it is easy to connect, has a user-friendly graphic interface and does not require software installations.

On the other hand, penetration of the Internet in Japan lagged behind the U.S. by about 2 years, but the Internet was expanding at a very rapid pace. (See Figure 3.5) Japanese banks felt that they needed to prepare themselves for Internet banking and the opportunities presented by the Internet.
3.6 Issues in 1995

Before 1990, IT investment in the Japanese banking industry was very successful in the area of cost reduction effects. On the other hand, this success story left some issues in 1995. We summarize these issues below.

➢ Objective of IT Investment

Since banks introduced IT, they made the most of IT as powerful tools to reduce cost and to support managers by providing useful managerial information. At first, they replaced traditional manual operation processes with new automated computer operation processes. Under a highly regulated environment, the most important things were to introduce IT as soon as possible and to realize its cost reduction effects. Of course, they considered IT as tools to create new business, but under regulation, it was a limited effort.

In addition, IT brought up other issues about system architecture. In order to seek cost reduction effect and to connect their networks to each other, individual systems gradually lost differentiation.

➢ Organization, Human Resource and Culture

Up until the 1990’s, made much effort was made to establish appropriate organization, human resources and the culture to fit with software developing processes on mainframe systems. They standardized whole software developing projects. Although they did not have the appropriate human resources with IT backgrounds in their organization, they made efforts to create such people in their organization. Standardizations and in-house development policy made organizations inflexible under low motivation. Therefore, the System Developing Division had no motivation to ascertain the trend of new technologies and it thought that system developing projects based on client-server system architecture was out of their scope.

➢ Capabilities of Information Technology

On the other hand, information technologies evolved at a very high pace, and downsizing became clear in the 1990’s. While U.S. banks were implementing on-line banking, most Japanese banks were enhancing traditional electrical...
banking applications and straggling client-server architecture systems. In 1995, we can say that Japanese banks lost IT capabilities completely.

- **End User Computing Policy**
This policy prompted an increase of small but plentiful client-server systems designed to fit with end-users needs. Those system development projects were organized by end-users themselves. There was no standard policy and few people educated in the sophistications of information technology. Therefore, there were many isolated small client-server systems for each bank. These systems often became ‘black boxes’ and left no room for improvement.
Chapter 4 Case Studies of IT Investment in a Japanese Bank

In this chapter, we show three case studies of a Japanese city bank. We have chosen Bank of Tokyo-Mitsubishi as our example. In 1997, two city banks, Mitsubishi Bank and Bank of Tokyo, merged and established Bank of Tokyo-Mitsubishi (BTM). In 2000, BTM and Mitsubishi Trust Bank & Corp. established Mitsubishi Tokyo Financial Group (MTFG), which is one of four large financial groups in Japan. (see Table 4.1).

The first case is a story about transformation of IT investment strategy. BTM changed its strategy dramatically in 1997 and we will find that BTM migrated from mainframe architecture to web based architecture.

The next two cases show the effort and struggle faced while making the transition from legacy technology to new technology. We will find there are not only multiple technical hurdles but also organizational, human resource and cultural hurdles on the way.

Table 4.1 History of Bank of Tokyo-Mitsubishi

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>Founded</td>
<td>1880</td>
<td>Founded</td>
</tr>
<tr>
<td>1987</td>
<td>Start Third Generation System</td>
<td>1988</td>
<td>Start Third Generation System</td>
</tr>
</tbody>
</table>

Bank of Tokyo-Mitsubishi

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>Mitsubishi Bank and Bank of Tokyo merged.</td>
</tr>
<tr>
<td>1997</td>
<td>Integration of Mainframe Systems</td>
</tr>
<tr>
<td>2001</td>
<td>BTM established Mitsubishi Tokyo Financial Group with Mitsubishi Trust Bank &amp; Corp.</td>
</tr>
</tbody>
</table>

Source: Author from MTFG Annual Report 2002
4.1  Case 1: Transformation from Legacy Technology to New Technology

4.1.1  Before 1995 – Investment to Mainframe System
Mitsubishi Bank and Bank of Tokyo, both city banks, have invested in mainframe architecture respectively. Both banks had experienced similar ‘three generation processes’ as the other eleven city banks. They developed similar integrated systems based on a mainframe architecture and built similar IT organizations and cultures as mentioned in Chapter 3. Referring to the evolutionary stages of banking systems in Japan as “generations” is commonly recognized not only by both banks, but also by the other city banks. However, the definition of the third generation differed from bank to bank according to their corporate strategy and capabilities.

➢  The Third Generation System of Mitsubishi Bank (MBK)
Mitsubishi Bank has competed with other large city banks especially in domestic banking markets. In this highly regulated market, large city banks aimed to get many shares in the domestic market. In particular, the total volume of deposits and loans and the number of money transfer transactions were target indicators.
Each large city bank had more than 250 branches and over 1,000 ATMs and CDs in Japan for customer convenience. Therefore, large city banks, including Mitsubishi Bank, designed their systems to handle large amounts of simple transactions from their branches, ATMs and CDs. In addition, Mitsubishi Bank considered three priorities from their strategic point of view.

(Priority 1)  Flexible and Easy to Expand System
In those days, the financial industry in Japan was changing gradually. After a highly regulated era, many felt changes, which was brought by deregulation, was very prompt and drastic. It seemed to be quite easy to anticipate that a lot of new services would be created and needs for the computer systems would change in some way in future. Because this time was a transitional stage, Mitsubishi Bank thought that the system had to be flexible and easy to expand.
(Priority 2) **Efficient Management Information Function**
For the same reason above, Mitsubishi Bank thought that an efficient marketing tool and a good decision support system would be very important functions in the future. Therefore, they believed this was their second priority.

(Priority 3) **Reliability and Security**
Mitsubishi bank had over 250 branches and over 1,000 ATMs and CDs in 1987. They thought that a focus on reliability and security was the banks main roles in society.

The total investment and expenses have amounted to more than $800 million. And total manpower employed has reached to more than 20,000 man-months approximately.

➢ **Bank of Tokyo (BOT)**
On the other hand, Bank of Tokyo focused their strategy on globalization. BOT built comparatively small mainframe systems to support domestic transactions which were smaller than Mitsubishi Bank. BOT had also focused on supporting international operations. BOT built a global money transfer network and developed standardized oversea office support systems. These systems were compact versions of the domestic mainframe system. Basically, these systems were standardized but they had some localized functions from country to country. They were stand-alone, office to office. These systems were developed in Tokyo, installed in overseas offices and supported from Tokyo. BOT invests and expense total $500 million approximately.

Both banks had different, highly detailed strategic forces and system infrastructures respectively. However, we could generally say that they had similar IT infrastructures, IT organization, standardization and culture. In addition, we found that each business unit developed UNIX based client-server systems to support their own needs. These projects were called end-user commuting projects.
4.1.2 From 1996-1997: Mainframe System Integration Project

In April 1996, Mitsubishi bank and Bank of Tokyo merged and were named Bank of Tokyo-Mitsubishi. Bank of Tokyo-Mitsubishi started mainframe integration project just after the merger.

BTM decide to integrate their main domestic operations to Mitsubishi’s mainframe and to integrate some international operations and overseas office operations to Tokyo’s systems. BTM management understood the weaknesses and strengths of both banks, and there were clear lines to distinguish them. This line was drawn between domestic operations and global operations. Therefore, top management, who thought that BTM should become a leading bank not only in domestic but also in global markets, could easily know which system they should choose. This integration project was finished successfully one year later, in May 1997.

The total investment and expenses have amounted to more than $150 million. And total manpower employed has reached to more than 15,000 man-months approximately.

4.1.3 Issues in 1997

After the mainframe integration project, BTM summarized issues concerning IT.

<Internal Issues>

(1) Limitation of Mainframe System

Mainframe architecture has a variety of technical limitations against some requests from business units. The BTM mainframe system, which was the former Mitsubishi Bank’s mainframe system, was developed with the policy of high-flexibility and ease in expansion. However, this flexibility was highly dependant on IBM architecture and it was warranted in the IBM mainframe world. Also, they were developed on client-server systems.
- Response time
Foreign currency dealers needed quick response dealer support systems, but it is difficult to develop that kind of software based on a mainframe system.

- Complicated calculations
Financial engineers, who developed and dealt interest rate swaps and options, needed complicated calculation processes to get Present Value. Sometimes, they also needed to use exponential functions and repetitious calculations to get present value. But this was impossible for mainframe architectures. They did not have usable functions for this in their library.

- Graphical User Interface
In those days, GUI started to spread world wide on workstations and in the PC world. However, it was impossible to provide GUI on screens used as terminals of mainframe systems.

(2) Capabilities
The System Developing Division, which basically had focused on mainframe architecture development, could not offer another technical solution as organization for user requests as mentioned above. They started a few trial projects with a UNIX based client-server architecture, but developing teams for those systems were isolated in System Development Division. They needed different types of developing processes, management styles, cultures and knowledge. Most of the projects were organized in business units by themselves. This was referred to as End-User Computing in those days.

(3) End-User Computing
On the other hand, end-user computing policy brought up another problem. In End-User Computing projects, each project team, which belonged to each business unit (BU), chose various IT solutions and IT venders which fitted the business units’ needs. Therefore, those systems were basically similar to client-server systems based on the UNIX operating system, but they are slightly different from each other and there was no standard among banks.
there were many isolated client-server systems in banks.

Ex) Treasury BU and Investment Banking BU had 19 dealer support systems and back office support systems. They were basically isolated client-server systems in that they were connected via LAN. Some systems transmitted their deal data by FTP function.

<External Issues>
(1) New Technology
The Internet was starting to break in Japan. This new technology was very different from the old technology. The new technology was based on a highly standardized technical platform within the IT industry. Most middleware and application software were independent from hardware, not like mainframe architecture. It provided many chances to small IT vendors, and they developed new technologies and architectures based on this platform. It enabled rapid evolution of IT itself and changed the relation between IT vendors and IT users. For IT users like banks, it was risky to over-depend on particular information technology and IT vendors.

(2) Deregulation
Deregulation of Japanese financial industry has been going on since the 1990’s. Before this deregulation, the Japanese banking industry had been highly regulated by the Ministry of Finance. The MOF designed many regulations to avoid excessive competition between banks. In this era, every bank provided similar products and services and had competed in cost. Therefore, deregulation meant that many banks competed under different rules.

(3) New Business
Under deregulation and rapid IT evolution, banks have many chances to enter new markets, to access traditional markets by new marketing channels and to improve their operation processes dramatically. This means that banks need to consider the effect of collaboration of IT evolution and deregulation.
Eventually, most banks decided to invest in IT continually. In addition, they decided that they should transition their IT investment strategy from mainframe oriented technology to web base technology in order to adjust to a rapidly changing external environment and to solve internal problems. Moreover, they decided to throw away end user computing policy.

4.1.4 IT Investment from 1998

<Budget and Roll of top management>
To begin with, the planning section stopped providing funds for improving and extending projects based on legacy systems and instead set aside more of the budget for new projects based on web based technology. In those days, top management frequently announced that BTM should be a leading company using IT in the banking industry, and each BU was encouraged to plan new projects applying web technology.

*We are committed to utilizing state of the art Information technology to increase efficiency in our existing operations. At the same time, we will develop new business fields through IT investment. In the four years through fiscal 2002, we intend to spend a total of 400 to 450 billion Yen including software, hardware, and personnel. These figures equate to around a 30% increase in average IT outlays.*

From Bank of Tokyo-Mitsubishi news release on Sep.13, 1999
In actuality, many projects were approved and started one after another. In 2000 and 2001, BTM invest over 60% of its IT budget in new projects based on new technology. We show over 5,000 man-month projects below.

**List of projects based on web technology (Over 5,000 man-month projects)**

- MI project (from 1998)
- Internet Banking project (from 1998)
- New Global Custody System (from 1998)
- CLS project (from 1998)
- New Branch Support System project (from 1999)
- New Oversees Office Support System project (from 1999)
➢ New Strategically Information System project (from 2001)

In addition, some important projects and inter-BU projects were initiated by the corporate planning division.

➢ Security Improvement
➢ New Strategic Management Support System project

<System Architecture>
While they decided to migrate to new technology, they did not entirely abandon the mainframe system which BTM had developed and expanded. They decided to utilize the mainframe as a database of domestic banking operations. As a data warehouse, the mainframe system, which had high reliability and security, had appropriate factors. Also, BTM had accumulated the capabilities to develop and maintain the mainframe system in System Developing Division. Therefore, it was not wise to throw away mainframe architecture and capabilities completely, if any place could be found to make use of them.

On the other hand, they decided to use new technology as middleware for domestic banking operations and as a platform for managerial information systems. They started to design some platforms which were categorized by related services, but were not firm wide single platforms. Therefore, there was a variety of platforms designed, for example an internet banking platform, branch operation platform, and dealing and trading operation platform. On these platforms, application software which supported the needs of various BU was implemented.

<Roll of System Developing Division>
End user computing policy was thrown away and System Developing Division initiated all system developing projects. Most of these systems were planned to be transformed as one of many applications on a single platform.

On the other hand, System Developing Division did not have the capabilities of web technology. Therefore, they outsourced all of the cording phase and most of testing phase and made the most of third-party vendors on the designing phase.

4.1.5 Summary of Case1
In case 1, we show the transition process of a Japanese bank. As a whole, the bank succeeded crossing over from legacy technology to new technology. I will summarize some lessons from this case.

- **Leadership in Top Management**
  As we saw in the case, top management announced the importance of new IT. They met with the System Developing Division to encourage them to try new technology and they encouraged the planning section of each BU to propose new technology based projects. In addition, the corporate center organized project teams concerned with inter-BU needs. We can say that top management prompted migration through leadership and budget control.

- **Success of Mainframe Integration Project**
  Just before BTM’s technology migration, BTM merged the two mainframe systems of Mitsubishi Bank and Bank of Tokyo. But this integration project did not negatively affect the next step. The most important reason for this is that the decision of which system they should take was made with a clear policy in mind, and there are clear lines drawn between both banks. BTM might have been very lucky to recognize the weaknesses and strengths of former banks.

- **Utilization of Legacy Technology and Capabilities**
  The bank migrated to new technology, but they never threw away the legacy system and used it as best as possible. We can find similar examples in other firms.

- **Business Unit Wide Platforms**
  BTM never design a firm wide platform or a single business unit oriented platform. On the other hand, BTM designed several business oriented platforms and developed application software requested from each business unit.

- **Initiative of System Developing Division**
  End user computing policy was thrown away and the System Developing Division transformed end user computing systems to new platform based on
web technology. In order to design the platforms mentioned above, this initiative would be very important. To arbitrate the technical needs of more than two business units, the initiative of System Developing Division was a crucial factor.

- Utilization of External Resources

On the other hand, the System Developing Division had enough time to transition their technical skills to web technology. At this point, out-sourcing and cooperation was an important factor.

Through these efforts, BTM was able to migrate from legacy technology to new technology. However, there were many small but important issues in implementation.

Next, we show some details of the efforts and struggles of implementation in two successful projects and summarize some lessons from cases.
4.2 Case 2: MI project

4.2.1 Market Risk Management System Developing Task Force
In 1997, BTM organized a task force team to study Market Risk Management Systems. In those days, treasury dealing and derivative dealing had grown into big business, and BTM wanted to be a market leader in treasury and derivative dealing, especially in the Japanese Yen market. Top management felt that they needed to know the daily base Value at Risk of treasury deals and derivative deals. To calculate VaR, they needed to gather all deal data into one database and to make statistical analyses. The assignment of this task force team was to survey dealer support systems and back office systems, which would provide original deal data to new systems, and to study the architecture of the market risk management system.

4.2.2 Issues from Task Force
The task force team soon realized several problems,

- There were 19 dealer support systems and back office support systems from product to product.
- Most of these systems had client-server architecture based on the UNIX operating system with several PC or workstation clients, but their version and programming language was slightly different from each other.
- Most systems needed some improvement or OS upgrade by Y2K.

The task force team reported that it was inefficient to gather deal data in this system infrastructure situation and they added some related issues as follows;

- Both BU and System Developing Division spend too much to maintain these 19 isolated systems.
- Dealers or back office operators, who dealt or operated multi products, needed to place 3 computer screens on their desk.
- Most systems had problems with security and reliability.
Finally, they recommended developing a product-wide infrastructure and discontinuing end-user computing policy.

4.2.3 Common System Infrastructure Development Project  
(Code Name: MI Project)

After that, top management approved the recommendations of the task force and organized a project team to develop a BU-wide infrastructure for market operations. This project was named Market System Infrastructure Project (MI Project) and was organized by the System Developing Division. The initial task force members became core members of the MI Project, and each application software transformation project was defined as a sub-project of MI Project. Initially, there were to be about 11 sub-projects organized continuously under the MI Project. Each sub-project need more than 1,000 man-month man power respectively.

As the first sub-project, derivative dealer support systems were initiated by the MI Project. There were three reasons why this is where they started. To begin with, former derivative dealer support systems needed to be renewed by Y2K. The second reason was that there were 2 dealer support systems and one back operation system. Therefore, they thought that maintenance costs would be down by transforming project. The third was that derivative dealers have a lot of potential and high level requests for system support, therefore they would be a good bench mark by which technology would be requested in the future. According to those reasons, MI project and Derivative Dealer Support System project (code name: Pyramid Project) were started at the same time in 1997.

4.2.4 Scope of MI Project Team

As their first step, the project team summarized the scope of MI project. They classified their task into six categories.

(1) MI Total Architecture
(2) MI Connector Development
(3) Standardization
(4) MI Library Development
(5) MI Supervision System Development
(6) Other Project Support

The first 2 categories, which were (1) MI Total Architecture and (2) MI Connector Development, were their primary task as a platform development team. “MI Total Architecture” meant the physical system architecture for new systems, and they needed to decide on the appropriate physical architecture. “MI Connector Development” meant core middleware development. Most of their function as a common platform was “connection” between server and client or between database and application. Therefore, they named them as “connector”.

Both (4) MI Library Development and (5) MI Supervision System Development were secondary tasks for them. Common modules and object libraries are crucial for efficient application development, and platform-wide supervision systems make the platform reliable and easy-to-operate.

On the other hand, although (3) Standardization and (6) Other Project Support seemed to be only additional tasks for them, they thought that standardization and the supporting application developing team were their hidden primary task. The MI Project was the first project to develop an integrated platform with web technology to be used by banks. There was neither a standard for designing, coding and testing application software nor the capability to develop software on a web platform. If the project team did not decide on a standard or support an application developing project, it could not have achieved their essential goal of an integrated platform for market operations. Therefore, these two tasks were significant aspects of the MI Project.

4.2.5 Research of Potential Needs
In order to decide both (1) MI Total Architecture and (2) MI Connector design,
they analyzed all operation processes and potential needs of each operation, including foreign exchange dealing, treasury, capital markets, bond dealing and derivatives. In an open system world, each component is standardized and users have much choice in their combination. This is very different from mainframe architecture, in which users may have some choice in each function, but are highly dependent on a mainframe architecture that is different from maker to maker.

In order to decide the best combination, the project team started hearing potential needs from dealers, traders and back operators. Potential needs meant future needs in order to make new platforms valuable and practical for as long as possible. They summarized them thusly:

- high response time
- high transaction volume
- 24 hour dealing
- global dealing, global position management, in Tokyo, NY and London
- external connection
- flexibility for expansion
- efficient, shared library
- possibility of package software
- straight through prospecting from dealer support systems to back office systems

Some of users requests were vague and loose, because dealers, traders and back officers needed to imagine their needs and some of their business were very changeable. For example, derivative dealers, who were creating few new products per year, mentioned that a “flexible system for expansion” was what they wanted.

Therefore, the project team needed to take into account this vague and loose potential need. Especially, MI project teams considered below maters.

- Flexible and easy to expand

On the new platform, they needed to implement 11 sub-application software.
Each dealer and back office has various needs. In addition, dealing and trading operations are one of most changeable, and this change is unpredictable. Therefore, they gave high priority to preparing invisible future needs.

- **Straight Through Processing**

  Former dealer support systems and back office systems were basically isolated systems, although they handled same deal transactions. These data were inputted two times in both front offices and back offices. Some dealer support systems and back office systems were transferring their deal data by FTP function, but the database structure of both systems differed from each other despite the fact that they dealt with same transaction. Therefore, they needed to transform data structure and FTP function along with a very complicated data transfer process. This brought up serious system trouble. Therefore, the project team thought that new platform support would make it easy to implement straight through processing.

  Of course, the new platform should easily and stably transfer data to mainframe systems.

---

4.2.6 **Appropriate Information Technology**

After operation analyses, they summarized basic ideals and decided on technology and architecture including MI Library and MI Supervision System (See Table 4.2 and 4.3). As a result, BTM employed 16 IT vendors in order to combine appropriate technology.
Table 4.2 Basic Policy and Ideal for MI platform

<table>
<thead>
<tr>
<th>Ideal Functions of Common Infrastructure</th>
<th>Action Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sharing Front System</strong></td>
<td>3 Tier Systems (Independence of GUI tier)</td>
</tr>
<tr>
<td>① share each GUI window</td>
<td></td>
</tr>
<tr>
<td>② share each Deal Capture function</td>
<td></td>
</tr>
<tr>
<td>~ DB access method and function</td>
<td></td>
</tr>
<tr>
<td>③ coordination with new Branch Office System</td>
<td></td>
</tr>
<tr>
<td><strong>Sharing Application Functions and Systems</strong></td>
<td>3 Tier Systems (Independence of application tier)</td>
</tr>
<tr>
<td>① share each application logic and function</td>
<td></td>
</tr>
<tr>
<td>② utilize every basic function as calendar etc. for every new systems</td>
<td></td>
</tr>
<tr>
<td><strong>Sharing data and DB</strong></td>
<td>3 Tier Systems (Common DBMS)</td>
</tr>
<tr>
<td>① share DB access method and function (using same DBMS and functions)</td>
<td></td>
</tr>
<tr>
<td>② coordination of data format and codes (manage every data type and value)</td>
<td></td>
</tr>
<tr>
<td><strong>Manage and Control every front data and back (booked) data</strong></td>
<td>independence of DB (by products)</td>
</tr>
<tr>
<td>① 1 product 1 DB (both global and local book)</td>
<td></td>
</tr>
<tr>
<td><strong>Centralize Interface for other Systems</strong></td>
<td>center Gateway system MI-Connector</td>
</tr>
<tr>
<td>① centralize each settlement system (for CLS, SWIFT, and BOJ-NET etc.)</td>
<td></td>
</tr>
<tr>
<td>② coordination to HOST systems and others</td>
<td></td>
</tr>
<tr>
<td><strong>Manage and Control every system in centralized 1 system</strong></td>
<td>use Packaged Systems single sign-on system Parallel Servers</td>
</tr>
<tr>
<td>① centralized control of every system (troubleshooting and daily operations)</td>
<td></td>
</tr>
<tr>
<td>② security control</td>
<td></td>
</tr>
<tr>
<td>③ 24 hours operation and global operation</td>
<td></td>
</tr>
<tr>
<td><strong>Standardization</strong></td>
<td>use design tool make standard and guide make data dictionary</td>
</tr>
<tr>
<td>① for new products (fast and quick development)</td>
<td></td>
</tr>
<tr>
<td>② high productivity (prevent dual developments)</td>
<td></td>
</tr>
<tr>
<td><strong>Data Warehouse</strong> (Global data gathering)</td>
<td>make standard and rule make data dictionary MI-Connector</td>
</tr>
<tr>
<td>① convert format, code, value, ..... (product code, deal code, customer code, etc)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author
<table>
<thead>
<tr>
<th>Technology</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java/Web</td>
<td>・Thin clients&lt;br&gt;・independence from OS, vendor, version, etc.&lt;br&gt;・manage Total Cost of Ownership (TCO)&lt;br&gt;・independence from location&lt;br&gt;・portability</td>
</tr>
<tr>
<td>ORB (CORBA)</td>
<td>・Clients～ Servers, Servers～ Servers&lt;br&gt;communication control&lt;br&gt;Common use for every system</td>
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<tr>
<td>Hitachi-TPBroker</td>
<td>・reliability and functions&lt;br&gt;・maintenance and system support&lt;br&gt;(experience in other banks)</td>
</tr>
<tr>
<td>Oracle8</td>
<td>・performance, parallel functions&lt;br&gt;・partitioning&lt;br&gt;・high level replication, snap-shot&lt;br&gt;・Developer2000&lt;br&gt;(market share, de facto standard)</td>
</tr>
<tr>
<td>SunEnterprise10000 (New Derivative Front etc.)</td>
<td>・scalability&lt;br&gt;(expand by products, data, clients, location of offices, etc)</td>
</tr>
<tr>
<td>IBM SP2 (Risk Mgt. System etc.)</td>
<td>・high speed (performance)&lt;br&gt;・reliability and 24hours operation</td>
</tr>
<tr>
<td>JP1 (Hitachi’s Product)</td>
<td>・centralized control functions&lt;br&gt;・managing functions of users and clients&lt;br&gt;（log-in ID, security.）</td>
</tr>
<tr>
<td>Designer2000</td>
<td>・productivity&lt;br&gt;・standardization</td>
</tr>
<tr>
<td>Jbuilder</td>
<td></td>
</tr>
<tr>
<td>MQSI (Neon)</td>
<td>・Dynamic data conversion and control&lt;br&gt;・coordination with IBM MQ</td>
</tr>
</tbody>
</table>

Source: Author
4.2.7 **Standardization Policy**

This was the first project in which BTM developed a standardized product-wide platform based on open architecture. Therefore, the project team considered not only appropriate system architecture but also appropriate standardized policy for developing application software, operation. The project team standardized 4 areas:

- Hardware & OS Standard
- Architecture Standard
- Designing Guideline
- Cording Guideline

The MI Project team also insisted that *every project must be developed under MI System Architecture and Concept.*

4.2.8 **Out Sourcing & Project Management**

The MI Project team was organized by several BTM proper and several third-party venders from the designing phase.

From the designing phase, the project team needed to look for the right person who had the appropriate experience and skill in web technology. Of course, there was no such right person in the company, because the System Developing Division of BTM accumulated resources and capabilities to do mainframe project and BTM did not have any kind of R&D function. On the other hand, there was not enough time and not enough efficiency to create those people within BTM or to hire those people from outside of BTM. Therefore, the MI Project became highly dependent on third-party venders’ appropriate people.

To line up the appropriate human resources, the project team engaged 16 venders technology by technology, or component by component. In open system architecture, each third-party vender had their own strengths and weaknesses
in technology and products. On the other hand, the project team decided that they should pick up the appropriate solution and technology function by function. They thought that there was merit in open system architecture only by the combination of appropriate functions under a standardized interface. In conclusion, they engaged 4 third-party vendors. Of course, all of the BTM members of both the MI Project and sub-projects took some technical courses provided by outside educational organizations. But this was to support planning and designing tasks, and they never made detailed specifications or programs.

The MI Project team knew the difficulties of a multi-vender team. They already experienced these difficulties in other system developing projects on a mainframe. In the mainframe era, they outsourced detailed designing and coding tasks to various software vendors. In those projects, they suffered from difficulties in scheduling and budget management or quality control according to communication gap and cultural gap. Therefore, the MI Project team was concerned with third-party vendor management. They made space for vendors in the BTM system developing site and encouraged vendors to work in the BTM site and communicate with core project members. Members of third-party vendors were provided Lotus Notes, which all BTM employees were provided as BTM standard groupware, under limited access control. Also, they drew a line between vendors responsibility according to strict architectural standardized policy.

In addition, they concerned themselves with not only third-party vendors’ technical skill, but also with their financial status, stability as company and the company’ managerial policy.

4.2.9 Release in 2003
The MI platform was released in 1999, and the first application software on this platform was released in 2000. After that, 7 application software projects were successfully released, and 5 blocks of platform oriented modules, which enhanced platform, were released by 2002. Many of the standardization
policies and guidelines were summarized as materials. However, they now suffered from the next application developing project. This project included 2 first trials as an MI project. One was to implement package software. Foreign currency exchange dealers requested an installation of package software, named Wall Street System (WSS) on the MI platform. In fact, WSS is a state-of-the-art dealing support system developed by a U.S. software vendor. The other was a request for 24 dealing support systems and a global position management based on global dealing transaction data gathering. The MI platform could easily fulfill two requests in the design phase, because the MI platform predicted these needs from the initial design phase. However, the project team suffered from multi-vender development issues. WSS vendors sent their specialists to Tokyo and they worked with the BTM project team and other vendors on the BTM developing site. But some communication gaps and cultural gaps, based on country differences and package software vendors, left. Finally, the release date was postponed 3 months.

4.2.10 Summary of Case 2

- Leadership of IT organization
IT organization displayed leadership in new technology projects under top management support as mentioned in Case 1. They found fundamental problems and worked to get top management to change the initial goals of the project. They talked BUs into giving up end-user computing and into developing a BU wide platform.

- Architecture
The MI Project team studied not only current needs but also potential and long-term needs in the design phase to develop a more flexible and easy-to-expand platform. These requests were vague and loose, but they realized that it was important to consider these requests and predictable requests in an unpredictable era. They chose a combinatory architecture which best fit the components and middleware.
In later projects, this architecture provided full-potential flexibility and implemented global needs and package needs. At the same time, the best combination policy brought up multi-vender risk as mentioned below.

➢ **Standardization**

We find that they set standardization as their own primary task and standardized from everything from designing processes to cording and testing processes. This standardization enforced sharing of knowledge for new technologies and developing style not only in BTM but also in third-party vendors.

➢ **Out Sourcing & Project Management**

They outsourced all coding and basic testing tasks and most of the designing tasks to third-party venders. They accumulated technical skill in BTM employees not only for cording and testing but also for future design. However, multi-vender project team brought up several issues. They predicted this matter from their mainframe experience and made every effort to wipe up communication gaps and cultural gaps. Nevertheless, it came to the surface in some projects.
4.3 Case 3: e Business & IT Initiative Division

In Case 2, we present an example of migration by the System Development Division. BTM has one more division which is deeply related to IT. In this case, we mention the reason why this new division was established, its roll and tasks in BTM, and compare it with similar divisions of other banks.

4.3.1 Issues in 1997 related to e-business in Japan/BTM

In 1997, the management of BTM understood that the external environment was drastically changing under the deregulation of the Japanese financial industry and IT revolution.

<External>

- In Japan, penetration of the Internet was about 2 years behind the U.S. By 1997, however, the Internet was starting to break in Japan. (See Table 4.4)
- U.S. banks realized the Internet as a new channel for providing financial services not only to personal customers but also to corporate customers. In other words, they started internet banking and looking into new businesses such as e-settlement, e-money and e-commerce.
- In the U.S, some banks made alliances with companies within other industries.
- Several Japanese banks were preparing to start on-line banking.
- It was the first time since WW2 for the Japanese banking industry, including BTM, to study new businesses by themselves and to make close alliances with companies in other industries.

In contrast, internal technological capabilities, culture and the organization of BTM seemed to remain in a traditional condition adjusted to a legacy environment.

<Internal to BTM>

- BTM did not start any services via the internet. They thought that the Internet would have potential not only to reduce cost of traditional banking operations but also to provide new businesses related to finance.
BTM did not have enough technical capability for the Internet or planning capability to create new business.

System Developing Division of BTM had been highly focused on mainframe systems and had had no experimentation in internet-technology based systems.

As we show in case 1, top management had a strong pressure for the IT revolution and decided to migrate from legacy IT to new IT. But there was no organized function to survey and create new business at that time.

4.3.2 e Business & IT Initiative Division

After Mainframe Integration Project, top management decided that BTM should establish a new division, the e-Business & IT Initiative Division, under the corporate management (See Figure 4.2). The new division has its own budget and it amount become more than $20 million at 2002 and can use its budget for their own porpoce. This new division was independent from the System Developing Division and had two goals:

- Study and research the trend of information technology, and support other business units to translate traditional banking operation processes to efficient and low-cost processes by means of IT.
- Search for new business opportunities among both personal businesses and corporate businesses and start up them.

Source: MTFG Annual Report

The new division became the first organization which had been assigned officially and primarily both R&D and business development tasks. In general, business development tasks had been assigned to small groups within each BU. They sought and developed new products as extensions of their BU’s main business. However, top management thought that it was difficult for each BU to catch up with other financial firms and create new business by their own efforts in such a unstable era. They also thought that even the System Development Division was bound up in migration from legacy system making it difficult for
the System Development Division to make initiatives in IT based e-business at that time. On this background, top management decided to establish a new division with both R&D and business development functions.

On the other hand, each of the business units took initiative to improve their own business processes using IT with support from the e-Business & IT Initiative Division. Also, the practical system development project was an initiative taken by the System Development Division.

In addition, about 80 people moved from each BU, including the System Development Division, to the new division. And they employed 20 people from outside of banks. At the end of 2002, about 100 people are working for the new division.
Table 4.4 When did banks start Internet banking services? 4-17

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<td>BTM</td>
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<td>Citigroup (Japan)</td>
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<td>Sony Bank(*)</td>
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</table>

(*) Online Only Bank

Source: Author, from Annual Report and Web site of each firm
Figure 4.2 Bank of Tokyo Mitsubishi, Organization Structure at 2002

(*) UNBC, UnionBanCal Corporation, is a U.S. commercial bank holding company. Bank of Tokyo-Mitsubishi owns 67% of UnionBanCal Corporation, a publicly traded company listed on the New York Stock Exchange. Union Bank of California, N.A., UNBC’s bank subsidiary.

Source: Author, from Mitsubishi Tokyo Financial Group Annual Report 2002
4.3.3 Projects of e Business & IT Initiative Division

In 1998, the former Sumitomo Bank started their first internet banking service on the web. First, they provided only a simple account inquiry service but soon added a fund transfer service. BTM, however, could not start their on-line service at that time. BTM didn’t start their first online banking service until late 1999, being one of the last of the 4 financial groups to do so. One reason for this was that BTM was focused Mainframe Integration Project, while other banks were planning their on-line service. In any case, BTM needed to catch up with the other three

BTM’s projects were roughly categorized into two classes: a transformation support project and a new business project.

<Platform Development>
- BTM developed a new platform for internet banking. Main account data was on a mainframe and this platform corresponded to middleware.

<Transformation support>
- To begin with, the e-Business & IT Division encouraged the Retail Banking BU to transform retail banking from traditional PC banking & telephone banking to internet banking. In addition, they introduced basic banking services, like inquiry, deposit and fund transfer, on the BTM web page, not only for PCs but also mobile phones via i-mode by NTT DoCoMo.
- They supported Corporate Banking BU and Global Corporate BU and they made corporate banking operations & services transition from traditional PC based electronic banking technology to web based technology.
- Now the e-Business & IT Initiative Division and the CB BU are planning B2B based new business and developing B2B web services. BTM believes most of B2B web services, like EDI and business portal service, are extensions of traditional banking business. Therefore, CB BU has initiative in these matters and the e-B&I Division offer support with their IT knowledge.
<New Business Opportunities>

- **e-payment service**
  
  First, they provided new payment services on the Internet for C2B payment services based on BTM personal account.

- **BizSTATION**
  
  Next, they provided the BizSTATION service as a BTM-wide platform for firms. BTM is planning to provide complete B2B service on web and new connection channels between account officers and firms. Therefore, they will implement a secured mail service and application service for loans.

By 2002, BTM had finished transforming from a traditional direct banking channel to an online banking channel. Fig.4.X shows the internet services of core banks of the 4 financial groups as of March 2003. It is clear that BTM has caught up with other banks in spite of their late start, and BTM has transferred more services from legacy direct banking channel, PC banking and telephone banking, to new Internet channels than the other banks. BTM is still providing many international services by legacy direct channel and needs to transfer more services.

At the same time, 4 banks provide similar services in new business fields.
Table 4.5 Comparison for Internet Banking Service in 2003

<table>
<thead>
<tr>
<th>Segment</th>
<th>Fuction</th>
<th>BTM</th>
<th>SMBC</th>
<th>UFJ</th>
<th>MIZUHO</th>
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<tr>
<td>Retail</td>
<td>Inquiry of Yen Account</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td></td>
<td>Found Transfer (Domestic)</td>
<td>☐</td>
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<td></td>
<td>Mortgage</td>
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<td></td>
<td>Card Loan</td>
<td>☐</td>
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<td></td>
<td>Inquiry of Foreign Currency Account</td>
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<td>☐</td>
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<tr>
<td></td>
<td>Fund Transfer (International)</td>
<td>☐</td>
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<td></td>
<td>Online Settlement (B2C)</td>
<td>☐</td>
<td>△</td>
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<td></td>
<td>Mutual Fund</td>
<td>☐</td>
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<td></td>
<td>Damage Insurance</td>
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<tr>
<td>Whole Sale</td>
<td>Inquiry of Yen Account</td>
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<td>L/C Open(*3)</td>
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<td>L/C Information Inquiry(*3)</td>
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<td></td>
<td>Market Place</td>
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</tbody>
</table>

Source: Author
BTM shifted their focus to seek new business opportunities and started some businesses. All banks update their Internet page every month and are constantly enhancing and improving them.

4.3.4 Issues at 2002

- Conflict of BU and System Service Division
- For the retail segment, integration of insurance and credit card aggregation service.
- For the wholesale segment, EDI and B2B

4.3.5 Summary of Case3

- e Business & IT research Division
  BTM established a new division for e-business. Their tasks were to support the migration of basic banking operations from traditional channels to Internet channels and to seek new business opportunities. The latter being only a symbolic task for the bank.

- Supporting Migration
  BTM was the latest of the four financial groups to start their Internet banking service, but BTM soon caught up and are now providing more services than the other banks. BTM established a new, independent division for e-business under top management leadership. It will be one reason of rapid migration.

- New Business Opportunities
  BTM also started to offer new services on the Internet, but all of the core banks of the other financial groups were providing similar services and these services were not seen as block buster or revolutionary.
Architecture
Along the same lines as the MI Project in Case 2, BTM developed a platform for Internet banking service and are now developing other platforms for B2B services. These platforms are the upper layer of the mainframe system, which is used as a data warehouse of customer accounts.

Organization
Top management established an e-Business & IT Initiative Division under the corporate management center. This new division was independent from the System Developing Division and assigned two tasks. One task was the transformation of basic banking operations from traditional, direct channels to Internet channels. The new division was assigned to support each BU. The other is seeking new business opportunities. They almost completed the first task successfully but are still straggling with the second task.

On the other hand, the new division brought inter-organizational conflict. All three, the BU, System Development Division and new division, needed to adjust to each other. Sometimes, their responsibilities overlapped or interfered with each other’s.

In Chapter 4, we showed 3 cases involving one core bank of the top 4 Japanese financial groups. In the next chapter, we will discuss the relationship between corporate strategy and IT, issues of technology and system architecture, and issues of organization and human resource.
Chapter 5 Research and Analysis of IT Investment

In this chapter, we show some of the recent research into IT investment and strategy and make some analyses of the cases discussed in the previous chapter.

5.1 Influence of IT Revolution for IT Users

In this section, we discuss IT innovation and its influence for heavy technology users. We first introduce some studies conducted by great researchers about the innovation dynamics. And next we discuss the influence of IT revolution for banks.

5.1.1 IT Revolution and Dynamics of Innovation

In the field of technology strategy, there are many studies about the dynamics of technology innovation. James M. Utterback, who is the author of *Mastering the Dynamics of Innovation*¹, shows that technology innovation has some technological discontinuities and many leading companies cannot survive when they face a disruptive technology. Clayton M. Christensen, who is the author of *The Innovator’s Dilemma*², explains the reason why leading companies offering one technology or product can easily lose their position when a disruptive technology emerges. Although there are many active discussions in this field, the technology S-curve is accepted as a conventional characteristic of technology innovation. Figure 5.1 shows the concept of the technology S-curve.

We do not discuss in detail the dynamics of innovation in this paper. We, however, refer to these studies, especially the conventional technology S-curve concept, in order to understand evolution of information technology and influence of IT revolution from the perspective of banks, which are heavy IT users.

We explain the evolution of information technology from mainframe technology
to web-based technology by using the technology S-curve chart. In Figure 5.1, we can think "the first technology" as the mainframe technology and "the second technology" as the web-based technology respectively. The vertical line indicates the total performance of a group of information technologies. When users of IT evaluate IT systems, it is conceptually effective to use the total performance as indicator. And we can roughly say that the point of inflection falls somewhere in between the years of 1990 and 2000. There may be some discussions about this assumption, but the most important thing is to introduce the technology S-curve concept for IT users.

**Figure 5.1 Conventional Technology S-Curve**

![Figure 5.1 Conventional Technology S-Curve](chart.png)

*Time or Engineering Effort*

Source: Clayton M. Christensen, The Innovator’s Dilemma
5.1.2 History and Future of IT Investment in Japanese Banking Industry

In Figure 5.2, we plot each IT investment of BTM on the S-curve graph. Three distinctive investment projects, or a series of projects with transition in stages from the first generation investment to the third generation investment, are plotted on the curve of the mainframe technology. And we can plot the migration investment, which is defined as the intensive investment in web technology, on the curve of the web-based technology. We can suppose that the migration investment by BTM is located on the point of inflection.

In general, we can say that Japanese banks did not ignore the trend of IT evolution in the past. Japanese banks invested in IT systems continuously in line with the evolution of IT, not only in the inflection period but also in the mainframe era. It is clear that Japanese banks had a clear idea that they had to migrate with the technology trend although they were merely IT users.

BTM, however, could not temporarily follow a new technology trend in the period of 1990 through 1997, and made great efforts to catch up the web-based technology after 1997. As a result, BTM was able to migrate successfully in 2002, but BTM could have migrated better at a lower cost if it had prepared for new technology.

We cannot ignore the two exceptional factors which emerged around BTM in the period of 1990 through 2000. One is the deregulation of the Japanese financial industry. As we have investigated in Chapters 2 through 4, deregulation, combined with IT revolution, encouraged a drastic change for the Japanese banking industry including BTM.

The other factor is a mainframe integration project implemented by BTM from 1995 to 1997. BTM concentrated their IT development resources on this project. Therefore, we can say that BTM could not use its resources to follow new technology.
On the other hand, we should also look to internal beliefs and actions which influenced BTM's behavior in the period of 1985 through 1990. As one of the IT users, BTM was less sensitive to a technology trend than IT vendors and manufacturing firms. In addition, BTM never experienced a drastic technology change that influenced its operations and business. Therefore, we think that BTM was not able to think of a drastic technology change and had a belief that the mainframe system would provide an appropriate solution for banks and remain to be the core platform in the future.

In addition, BTM concentrated its internal resources such as human skills, an investment allocation process, a system development process, standard policies, and an organization structure, on the mainframe system in its misbelief in the IT trend. As the studies about the dynamics of innovation show, accumulated internal resources resist migration. This is the second internal reason why BTM temporarily lost its position and needed strong leadership and heavy IT investments to migrate to web-based technology.

The history of the Japanese banking industry shows that banks cannot avoid addressing the IT evolution as heavy users of IT. In addition, we should predict that there is another point of IT inflection in the future. It means that banks need to migrate to new technology again in the future. Banks must learn from their IT investment history that they should prepare for IT migration. In case they cannot prepare well with their current IT investment strategies, they must change them so that they can catch up with a new IT trend.

We will come back to issues of IT strategy to deal with a technology trend for heavy IT users in the conclusion. We first investigate key success factors in the latter part of this chapter.
Figure 5.2 IT S-Curve from Bank’s Perspect

- 71 -
5.2 Strategy & IT Investment

In this section, we discuss the relationship between Corporate Strategy and IT Investment. Michel E. Porter has been studying corporate strategy for his famous book, Competitive Strategy. In a recent study, he redefined the meaning of “strategy” and discussed the relationship between strategy and the Internet. We discussed our case of a Japanese bank based on this research. In his work, Porter mentions some characteristics of Japanese companies, which will help deepen our dissection of this paper.

5.2.1 Definition of Strategy from “What is Strategy?”

In his paper, Porter cautions that many companies, especially Japanese companies, set their goals for growth by operational effectiveness and he insists that the activity for operational effectiveness is a necessity for all firms to be competitive with each other, but condition are not sufficient enough for them to do so. He also says that the activities for operational effectiveness are not strategy themselves, because the activities for operational effectiveness are easily copied by competing firms and are not helpful in sustaining a long term competitive advantage. Finally, he defines strategy as differentiation based on original activities and positioning and states that these original activities and positioning should be designed to maintain their competitive advantage. To establish and maintain a distinctive strategic positioning, he defines six fundamental principals.

(1) Strategic positioning must start with the Right Goal.
(2) A company’s strategy must enable it to deliver a Value Proposition, or set of benefits.
(3) Strategy needs to be reflected in a Distinctive Value Chain.
(4) Robust strategies involve Trade-Off.
(5) Strategy defines how all the elements of what a company does Fit together.
(6) Strategy involves Continuity of direction.
In order to enforce their own originality and sustain it in original activities, firms should *fit* their activities to their own positioning.

In addition, he classifies fit into three categories: consistency of activities, reinforcement of activities and adjustment of activities.

### 5.2.2 Relation between strategy and IT from “Strategy and the Internet”

In this paper, Porter discusses the relationship between Strategy and IT based on the findings of the previous paper mentioned above. Since the Internet has spread all over the world, many companies think that the only strategy for them is to implement and transfer their business and operations to a new business model and IT, and that first move would reinforce advantages in the Internet era by quickly establishing strong new-economy brands. In addition, many companies have argued that the Internet renders strategy obsolete.

Porter, however, insists that the opposite is true in reality. Because the Internet tends to weaken industry profitability without providing proprietary operational advantage, it is more important than ever for companies to distinguish themselves through strategy. The winners will be those that view the Internet as a complement to, not a cannibal of, traditional ways of competing.

He recognizes the Internet as the most powerful tool available today for enhancing operational effectiveness. On the other hand, he swears that the nature of Internet applications makes it more difficult to sustain operational advantages than ever. Because Internet technology is an open platform with common standards, companies can often tap into its benefits with much less investment than was required to capitalize on past generations of information technology.

Finally, he reiterates the necessity of sustainable competitive advantage and importance of *fit*, and insists that companies should deal with IT as a complement.
5.2.3 Corporate Strategy and IT in the Case of a Japanese Bank
Before 1995: Strategy and IT under Regulation

As mentioned in chapter 2, Japanese banks, including BTM, thought of IT as a powerful tool for operational effectiveness. But we believe that it was reasonable action under highly regulated environment. If we consider the six principles mentioned by Porter in this context, some principles work well, but others do no work at all.

First of all, the definition of (1) **Right Goal** does not work at all. They cannot afford to create new service and products for which customers would be willing to pay, because scope of their services and products are highly restricted by the authority. To implement operational effectiveness in financial companies, improvement of inner processes through IT is the only way. But as Porter mentioned in the second paper, it is not possible to rely on operational effectiveness to sustain competitive advantage.

At the same time, Japanese banks cannot have enough scope of products and services to consider the (4) **Trade-Offs** of their strategy. Since 1980, regulation of Japanese banking industry has been loosened very slowly and deliberately. All city banks in Japan saw deregulations as attractive business opportunities after regulation and concentrated. They never considered trade-off within a restricted scope of business.

In contrast, they made effort to (5) **Fit** their resources, including IT, to their goal of operational effectiveness, which was symbolized in the mainframe system. In the first and second generation system development, they transferred all main operations to the system and adjusted all employees to the new operation style in a short time. They built a high density ATM network in Japan with a lower population per ATM ratio than the U.S. after 1975. If you consider the size of Japan compared with the U.S., it is easy to understand the high ATM density in Japan. In the planning phase of the third generation system, BTM predicted that the attractive business opportunities resulting from deregulation would bring up frequent requests for system improvement. In order to deal with the urgent need for improvement, BTM employed system designers and programmers in the System Development Division and standardized the whole development process. Moreover, we may say that their choice of a highly-
integrated mainframe architecture was an effort to fit their IT capabilities with frequent, but minute, software improvements. These efforts for standardization fixed information technology as capabilities of them and made strategy being (6) Continuity of direction.

As Porter mentions in the first paper, these efforts of implementation would be characteristic of Japanese corporate culture.

Ironically, the strategies of all the large Japanese banks, including city banks, long-term credit banks and trust banks, became similar to each other due to deregulation.

**After 1995: Strategy and IT under Deregulation**

After 1997, the environment of the Japanese banking industry sharply changed due to two reasons. One reason was deregulation. Deregulation enforced competition in the banking industry and encouraged new faces from other industries. It also broadened the scope of business opportunities. The other reason was the revolution of IT, particularly the rapid spread of the Internet in Japan during this era. Japanese banks had just finished the third generation system investment and had built systems and structures to improve and maintain this system as the main tool for operational effectiveness. Japanese banks, including BTM, could not prepare for this new technology, although new technology was able to provide additional operational effectiveness and new business opportunities. We can say that Japanese banking industry entered a true competitive status after 1995.

In the face of deregulation and IT revolution, BTM changed its IT investment policy. Of course, operational effectiveness of new technology was also an attractive tool, and BTM directed their IT investment to new technologies. At the same time, BTM established an R&D and business development function under the corporate center. As mentioned in Chapter 4, we believe that it was a symbolic event that they transformed their strategy from a regulated environment to a deregulated environment.
To launch this migration, BTM needed strong leadership among top management to change their IT investment policy and change their attitude towards strategy. In the regulated era, they continuously adjusted their IT organization and developing processes to fit with a mainframe system-based architecture under operational effectiveness. Leadership from top management would be necessary to restructure their organization and developing process.

At the moment, BTM is still in the process of migration. BTM could transform main operation process to a new channel and architecture by using new technology, but they cannot get distinctive and sustainable outcome to support competitive advantage. As a member of a financial group, Right Goal is still vague and BTM might not need to be concerned with Trade-Off in their strategy.

5.3 Allocation of IT Investment

First, we will discuss the allocation of IT investment in this section. Jeanne W. Ross and Cynthia M. Beath studied these issues in their paper, *Beyond the Business Case: New Approaches to IT Investment*[^5^], and they propose an interesting framework with two dimensions, technology scope and strategic object, from their study of 30 U.S. companies. Using this framework, we discuss changes and issues related to BTM’s IT investment allocation.

Next, we analyze the appropriate IT architecture for BTM. Peter Well, Mani Subramani and Marianne Broadbent studied the relationship between firm-wide platform and each application software, and strategic agility of IT architecture in their great work, *Building IT Infrastructure for Strategic Agility*[^6^]. We expand on their findings and discuss the relationship between IT architecture and strategic agility.

5.3.1 Technological Scope vs. Strategic Object from *Beyond the Business Case: New Approaches to IT Investment*[^5^]

In order to describe the processes by which companies were incorporating...
Ross and Beath collected data between October 1999 and March 2000 in hour-long telephone interviews. They interviewed business and IT executives at 30 U.S. and European companies about e-business initiatives and the IT investments that supported those initiatives.

From this analysis, they found that investments differ along two dimensions: strategic objectives, which highlight the trade-offs between short-time profitability and long-term growth, and technology scope, which distinguishes between shared infrastructure and business solutions. They also classified IT investment into four distinct types according to these two dimensions. (See Figure 5.3)

![Figure 5.3 A Framework for IT Investment](source)

**Source:** Jeanne W. Ross et al, *Beyond the Business Case: New Approaches to IT Investment*, p.53
**Transformation**
As companies attempt to migrate to a more electronic business environment, many find that they lack the necessary IT capability. It is necessary to transform investments when an organization’s core infrastructure is limited in its ability to develop applications critical to long-term success. Transformation is triggered by the growing need for integrated customer data, end-to-end processing and platforms that provide around-the-clock support. Transformation initiatives are often risky and undertaken only when companies have determined that not rebuilding infrastructure significantly is even riskier. Enterprises whose outdated IT infrastructures have pushed them into a competitive crisis invest heavily in transformations.

**Renewal**
The shared or standard technologies introduced when infrastructures are transformed eventually become outdated. To maintain the infrastructure’s functionality and keep it cost-effective, companies engage in renewal. The potential benefits of renewal initiatives include improving maintainability, reducing support and training requirements, and making existing capacity more efficient. Renewal initiatives may also be driven by a vendor’s decision to withdraw support from old products.

**Process Improvement**
Business applications leverage a company’s infrastructure by delivering short-term profitability through process improvements. Business-process improvements should be low-risk investments because, unlike transformation initiatives, they focus on operational outcomes of existing processes. To reach that level of predictability, process improvements must build on an existing IT infrastructure. At the airline company, the new boarding application leveraged centralized access to specific data and shared, interoperable-technology platforms. The new infrastructure had driven fundamental organizational change; the new boarding application merely streamlined an existing process.
Experiments
New technologies present companies with opportunities or imperatives to adopt new business models. To learn about opportunities or imperatives, and about the capabilities and limitations of new technologies, companies need a steady stream of business and technology experiments. Successful experiments can lead to major organizational change with accompanying infrastructure change, or to more incremental process improvement initiatives.
The authors demonstrate this in their research using the example of a $500 million global manufacturer of identification solutions that decided in 1995 to start using the Internet to support its direct-to-customer channel. In order to learn about Internet technology and customer reactions to e-business initiative, they developed a limited online catalog. Customers drifted toward the Web-based catalog only gradually, but the experiment clarified the potential benefits of a full-scale online catalog and buttressed arguments for an organizational transformation that was already under way.

Distinguishing Among Investment Types
Although the four types of IT investment are conceptually distinct, the authors insist that they are difficult to distinguish in practice.

- A successful experiment may promote a process improvement. Or process-improvement initiatives may leverage a transformation. But companies should distinguish transformation investments from process-improvement investments, if the benefits are to be realized by different parties.

- Distinguishing between experiments and the investments that successful experiments trigger presents a particular challenge. When successful experiments are scaled up and rolled out, the company may invest in new infrastructure or applications. In hindsight, an experiment and its subsequent process improvement may look like a single investment. But companies’ experiments are designed to reveal profitability estimates and an investment in a process improvement that is expected to yield additional
The Distinction between transformation and renewal is the toughest one. Renewal investments replace old shared technologies with newer, more powerful or more cost-effective ones. Renewal may foster process improvement, but that is not its primary objective. Transformation, on the other hand, intentionally changes an enterprise’s infrastructure in ways that not only enable, but usually demand, process change. Because the value of renewal initiative does not depend on making changes to a business process, these initiatives are often the CIO’s responsibility. Process owners should not fund renewals of technologies that are too expensive for IT to support unless they accept responsibility for achieving the expected IT-service efficiency. Similarly, responsibility for transformation investments must be located with those who will compel the necessary process change.

Distribute Funds across Investment Type
The process of distributing funds across investment type demands a vision for IT will support its core business process. If the core processes are cross-functional and thus demand shared data and application integration, they drive the companies toward shareable, reusable platforms that make it easier to deliver applications and achieve cost-effective IT operations.

The authors also think that most companies constantly compare their existing process-support capability with their desired capability. The comparison usually provides the initial basis for allocating funds to transformation, renewal and process improvement. In contrast, funding for experiments may depend more on perceived opportunities of new technologies and the condition of the infrastructure. However, it depends on the industry and the vision of the company.

Prioritizing within a type
The second funding challenge is selecting projects within a type. No single technique can guide investment within all four types.
Funding Transformation
Investments in Transformation create a basis for long-term growth, but their payoffs are not easily and quickly achieved. Their value does not come from installing the technology; it comes from changing both operating and management processes; and perhaps operating and management culture, too. Quantitative tools such as decision-tree analysis or real-options analysis can assist decision making, but the authors think that ultimately most companies rely on competitive analysis and executive instinct.

Funding Renewal
Most renewal initiatives reduce the cost and raise the quality of IT services and thus can be justified with traditional quantitative analysis. The IT unit responsible for the cost and quality of shared IT services would also probably prepare the justification.

Funding Process Improvement
Process improvements that reach out to customers or back to suppliers are usually cross-functional and strategic. Thus they are often funded centrally. The authors think that discount cash-flow analyses should provide valuable guidance.
On the other hand, individual business units also have IT needs. Their projects typically do not require senior-management attention and are likely to be funded locally.

Funding IT Experiments
Companies fund experiments in myriad ways, including out of the CEO's pocket or from a business unit's budget. Some researchers have argued for the use of real-option analysis to evaluate the learning benefits of pilot projects, and others have demonstrated the use of real-options analysis for ranking R&D projects. But the authors think that it is difficult to figure out a way to put a value on the learning benefits so as to persuade a capital budgeting committee to invest in experiments.
5.3.2 Analysis of IT Investment Allocation of BTM

Before 1995: Investment to Mainframe System
As we mentioned in Chapter 2, Japanese city banks, including BTM, had invested in their highly integrated mainframe systems. Under a regulated environment, the motivation for IT investment directed to cost reduction effect by operation effectiveness and it was not possible to create new businesses. Therefore, BTM and other banks had not had the functions and processes to invest in new business opportunities.

It would be clear if we think about IT investment process based on the framework from the previous section. BTM and other banks have three distinctive generations of their system development process. In this process, they built firm-wide, integrated, mainframe-based infrastructures at first. Then, they developed and improved software as a process improvement and upgraded and improved their platform where necessary. They continued these process improvements and renewals until the launch of next generation projects. Then they came back to the first step and repeated the same process. We describe this process using the previous framework in Figure 5.4. According to this framework, we can define the initial platform-developing projects as transformation and following improvement projects as renewal and process improvement. Experiment never appeared in this simple loop.

However, we mentioned in Chapter 3 that BTM predicted the influence of deregulation and gave top priority to flexibility and ease of expansion on their third generation platform. After the highly regulated era, they might have thought that they were fully prepared for new business opportunities. In other words, they would have considered that the third generation platform would encourage experiment. But what they could implement on the third generation platform was not sustainable, competitive advantage nor business opportunities, but operational effectiveness and process improvement. They might not have imagined the business opportunities in those days. Or perhaps they could imagine that, but they might have placed low priority on them. Whether or not, both System Development Division and Business Units continued this IT
investment process and ignored investment in *business opportunities* or *experiments*.

On the other hand, a few end-user computing projects supported *business opportunities* or *experiments*. We mentioned in Case 1 that end-user computing policy provided flexibility which encouraged new business opportunities, but it was not organized and there was no standard policy. In the end, this policy brought about low profitability and inefficiency.

**Figure 5.4 IT Investment Process before 1995**

*Technology Scope*

- PROCESS IMPROVEMENT
- RENEWAL
- TRANSFORMATION

*Strategic Objective*

Source: Author, based on Ross et al
From 1995 to 2002: Investment to New Technology
BTM concentrated on mainframe integration projects until 1997. After that, they changed their IT investment policy from mainframe architecture to web architecture. They continuously allocated their IT investment to web-based projects, except for minimal allocations to *process improvement* and *renewal* of mainframe system.

These IT investments included process improvement based on transformation by web technology. Also, the System Development Division started to consider the possibility that the new platform would support business opportunities like Case 1. In addition, BTM established e-Business & IT Initiative Division and became aggressive in seeking new business opportunities. This situation from 1997 to 2002 is described using the framework presented in Figure 5.5.

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**Figure 5.5 IT Investment from 1997 to 2002**

![Diagram showing IT investment scope and objectives]

*Technology Scope*

<table>
<thead>
<tr>
<th>Business Solution</th>
<th>PROCESS IMPROVEMENT</th>
<th>EXPERIMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared Infrastructure</td>
<td>RENEWAL</td>
<td>TRANSFORMATION</td>
</tr>
</tbody>
</table>

*Strategic Objective*

Source: Author, based on Ross et al
We find that BTM allocated their IT investment to new platform projects and process improvement projects based on web technology. In addition, BTM clearly considered experimentation. For example, we find in Case 2 that the MI platform deeply considered flexibilities and ease of expansion for new business opportunities in the design phase, and we find in Case 3 that the e-Business & IT Initiative Division were established to encourage experiments and implemented a few new services.

On the other hand, the IT investment loop shown in the mainframe system era disappeared in this framework. We found in Case 1 that the top management leadership caused the migration. Prompt deregulation and the IT revolution pushed top management to change. However, BTM should continuously encourage seeking new business opportunities to create sustainable competitive advantage, as we discussed in section 5.2. What should BTM do to maintain this trend? Ross et al mention this in their analysis:

Companies allocate their funds to transformation, renewal and process improvement. In contrast, they do not include funding of experiments to this process and funding of it may depend more on perceived opportunities of new technologies and the condition of the infrastructure.


They also mentioned prioritizing within experiments, as follows:

Companies fund experiments in myriad ways, including out of the CEO’s pocket or from a business unit’s budget. Some researchers have argued for the use of real-option analysis to evaluate the learning benefits of pilot projects, and others have demonstrated the use of real-options analysis for ranking R&D project. But the authors think that it is difficult to figure out a way to put a value on the learning benefits so as to persuade a capital budgeting committee to invest in experiments.

In addition, they said:

*Companies fund experiments in myriad ways, including out of the CEO’s or CIO’s pocket, or form a business unit’s budget.*


This means that no funds may be allocated to experiments if companies allocate their funds only by standardized, pre-existing, process-support-based policy. Certainly, their comment after hearing from 30 companies was correct for BTM before 1995. In order to continue to investing in experiments, BTM should establish systems and/or processes for IT budget allocation and encourage it by permanent top management leadership in IT investment. We talk about these issues as organizational matters in section 5.4.

As a note, this migration of IT investment allocation policy may be helpful in encouraging experiments in investment. We, however, think that some architectural issues will appear in the near future, and that BTM should prepare to solve any future problems. We discuss these issues in the next 2 sections.
5.4 Analysis of Appropriate IT Architecture and Strategic Agility

In this section, we discuss IT architecture and its flexibility and ease of expansion. Peter Weill, Mani Subramani and Marianna Broadbent studied this area in their paper, *Building IT Infrastructure for Strategic Agility*. They insist that IT instructors should have strategic agility to adjust to unpredictable future requests from BUs and technological improvement. In this study, they break down an integrated IT infrastructure with a 10-capability cluster. They also insist that top-performing companies determine the unique combination of IT service clusters necessary to create strategic agility.

We will not discuss in detail the 10-capability cluster, but we will use their basic concept to describe flexibility and ease of expansion in relation to both architectures.


In Chapter 3 and Case 1, we make a rough sketch of system structure and the relationship between mainframe systems and end-user computing systems. We can summarize this structure as Figure 5.6. We describe this diagram according to the definition provide in the paper mentioned above.

It is clear that mainframe architecture does not provide *Business-Unit Infrastructure*, and each BU has to develop their application software on an enterprise wide infrastructure. In the case of BTM, this infrastructure was provided by the IBM mainframe and there are not only technical limitations, but also no flexibility in their choice of technology.

On the other hand, each BU’s own end-user-computing system is independent of the mainframe. They have to build their own infrastructure to fulfill their own requests for IT, which are never picked up as mainframe based projects by the System Developing Division. In this architecture, flexibility of infrastructure is restricted by its structure.
Figure 5.6 Structure of IT Architecture in 1995

Source: Author, based on Weill et al

<table>
<thead>
<tr>
<th>AREA</th>
<th>NAME</th>
<th>TECHNOLOGY</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local IT</td>
<td>Functions provided by both Mainframe and client/server architecture</td>
<td>BU operation support</td>
<td></td>
</tr>
<tr>
<td>Business-Unit Infrastructure</td>
<td>UNIX based Client/Server</td>
<td>Subordinate database</td>
<td></td>
</tr>
<tr>
<td>Enterprise-wide Infrastructure</td>
<td>Mainframe</td>
<td>Main Database Batch processing</td>
<td></td>
</tr>
<tr>
<td>Public Infrastructure</td>
<td>Telephone network Banking-industry network</td>
<td>External communication</td>
<td></td>
</tr>
</tbody>
</table>
After 1995: Multi Platforms by Middleware
Following mainframe integration projects, BTM started to invest in web technology and build some platforms. This structure is shown in Fig.5.X. In actuality, BTM has 6 distinctive platforms as follows:

- MI platform
- Internet Banking Platform
- Branch Operation Support System Platform
- Global Custody Platform
- B2B Platform
- New Managerial Information System Platform

All platforms are middleware between application software and the mainframe database. Development projects of these platforms are initiated by the System Development Division. End-user computing systems gradually disappeared and transformed into one of these platforms. On the other hand, the mainframe has both a database function and batch processing function. But the role of the mainframe is reduced compared with its role before 1995.

Some platforms are common platforms for more than 2 business units, such as MI platform, but they are generally designed to satisfy the requests of their respective business units. Therefore, this multi-platform structure can provide more flexibility and ease of expansion than a mainframe-based, single-platform structure.

But a multi-platform structure may bring up two issues in the near future. One is connectivity between mainframe and each platform. If they are not standardized, the maintainability of the mainframe will become worse. The System Development Division can provide flexibility of design and choice of technology to each platform, but it should standardize interface specifications between the mainframe and platforms. The other issue is the number of platforms. If BTM built too many platforms, BTM could not enjoy the efficiency of platforms and BTM might have to pay a lot to maintain these platforms. The
System Development Division should always consider the grand design of system structure in the multi-platform era.

**Figure 5.7 Structure of IT Architecture in 1995**

<table>
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<tr>
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<td></td>
</tr>
</tbody>
</table>

Source: Author, based on Weill et al
5.5 R&D and Outsourcing

5.5.1 R&D and Business Development Functions in Financial Industry
Traditionally, Japanese banks have not had centralized R&D or Business Development functions, but have developed new products within each business unit. A few business units have a product development team. For example, Derivative and Structured Finance Division of Investment Bunking BU has Research Section in order to develop new derivative products. However, most business units do not have distinctive R&D or product development functions, and they have never had any functions relating to IT.

On the other hand, many top U.S. banks have had centralized R&D or business development functions since 1990’s.
For example:

➢ State Street Bank & Trust – M&PD
In 1994, State Street created the Market and Product Development (M&PD) Group in their Staff and Support Service Units, and increased investment in new product development activities from 7% to 10% of revenues. M&PD was responsible for, in the words of former-CEO Carter, “plucking good ideas from the business units, developing the business case for them, coordinating the various divisions involved in their development, and championing them through to the market”. Although this group might provide support for various aspects of the project, specific activities like software development and product specifications were undertaken by the IT Development Division and by the particular business unit that would commercialize the products. Marshall N. Carter, who was chairman and chief executive officer of State Street Boston Corporation at 1996, explained his rationale for limiting the charter of the M&PD:

Before coming to State Street, I was at Chase Manhattan. Chase had a centralized group that was responsible for undertaking all aspects of product development of new products. When I got here, State Street was at the opposite
end of the spectrum. I wanted to steer a balance between the high centralized, strong product management function at Chase and the high decentralized approach being pursued at State Street. The M&PD group was designed to provide that balance.

Source: Interview in “New Product Development” case, p.9

By 1995, State Street had rolled out a record 15 new products and financial services, most of them were cross-division, bank-wide products.

Citibank: e-Citi

e-Citi was announced with great fanfare in 1997 as an independent business unit of Citigroup. The mission of e-Citi was:

*To create new financial services and e-commerce solutions to every customer segment, including large, mid and small-scale business, government and consumers.*

Source: Citigroup web site

They launched Citi-fi as an independent Internet only bank, Citi-wallet as a debit service for online shopping, Biz.com as an e-commerce supporting service for companies and so on. They acted as an incubator for Citibank.

In 2000, however, Citibank announced the formation of the Internet Operation Group, a high-level committee charged with spreading responsibility for Internet activities more evenly between e-Citi, an incubator for Internet initiative, and the bank’s business units. At the same time, Citibank also announced the creation of two units aimed at infusing the Internet into all consumer and corporate banking activities. They established e-Consumer and e-Business. 1,200 employees of e-Citi, which had 1,600 employees originally, were transferred to new units. Two more new business units, e-Capital Market and e-Asset Management, were added. In addition, City-fi was merged with Citibank.

Now, e-Citi is a technology group at the corporate level and is complement of
e-Consumer, e-Business, e-Capital Market and e-Asset Management. In order to leverage IT investment, U.S. banks have established independent products and service development units/divisions. In addition, Citibank has incorporated an IT R&D function. On the other hand, they are struggling with finding the appropriate organizational structure and maintaining balance between the creation of new businesses and technical transfer of traditional business

➤ **BTM: e-Business & IT Initiative Division**

In Case 3, we mentioned business development and R&D organization in BTM, e-Business & the IT Initiative Division. On the point of balance between centralization and decentralization, the function of the new division is close to that of the M&PD group of State Street Bank, but there is a clear difference in function and performance.

1. The new division has the additional function of researching and studying the trends in Information Technology. This additional function is similar to the main function of e-City after 2000.
2. Up until 2003, the main focus of the new division was to encourage each business unit to transform new Internet channels. Therefore, the new division could not create new business like the M&PD group.

We describe the initiatives of the business units and divisions on Roll's IT investment framework, as in Fig.5.8. It would be helpful for us to understand which group would take initiative in each IT investment.

**Business Units**

The role of the BU in IT investment is to encourage *process improvement*. This was usually done in BTM, but now is supported by the e-Business & IT Initiative Division to prompt migration from legacy channels to new Internet channels. This collaboration works well, as we found in Case 3.
System Development Division
This division directs their efforts to renewal and transformation. In other words, it is responsible for all shared infrastructure areas of the Technology Scope. While this is primarily the System Development Division's role, some areas of transformation are initiated by the e-Business & IT Initiative Division to encourage transformation to Internet channels for the technological aspect. On the other hand, SDD does not have any formal R&D function.

e-Business & IT Initiative Division
This division's mostly symbolic role is experimentation. It is a trial venture not only for BTM, but other Japanese banks, to create firm wide business development groups. However, its responsibilities have expanded to include
transformation and process improvement fields.

In this Figure, it is clear that the e-Business & IT Initiative Division has broad functions to encourage new technology investment. BTM smoothly transformed from legacy channels to the Internet channel in 2003. Therefore, we recommend reformed role for the e-Business & IT Investment Division and System Development Division, in order to expand their business and accumulate their IT capabilities.

**e-Business & IT Initiative Division**

This division should take charge of new business enhancement functions immediately and should throw away any information technology R&D functions.

**System Development Division**

This division should create an information technology R&D group within itself and take on the information technology R&D functions from the e-Business & IT Initiative Division. Of course, they should also collaborate with each other. In addition, the SDD should accumulate their new technology capabilities with from IT projects.

5.5.3 Out Sourcing of IT Functions

Before 1995, BTM carried out cording and testing process within their internal work force. At the peak of each generation development, they asked third-party software vendors to support their cording and testing process. During this time, however, BTM never forgot to accumulate capabilities in these processes and in fact made every effort to incorporate them.

On the other hand, BTM started to outsource most of their development processes from 1997. Of course, BTM left most of the planning and designing processes to the System Development Division, but most IT capabilities which BTM had accumulated did not apply to new technology based development projects. BTM realized that it could not catch up with rapid technology evolution if they persisted in in-house development.
We believe that outsourcing of developing processes would be more efficient for financial firms. They should enhance their research capabilities to catch up with technological trends and to distinguish appropriate technology for strategic vision.

5.5.4 Marti Vendor Team and Project Management
In Case 2, we found that BTM decided to work with several vendors to provide an appropriate combination of technology and middleware products in an open architecture. In addition, BTM managed several vendors in one system development project. One of these multi-vendor projects is suffering from communication gap.

We believe that project management skills would be a key success factor in the multi-vendor era, and that these skills should be accumulated in the System Development Division.
5.6 Summary
In this Chapter, we discussed several topics from corporate strategy issues to related issues, such as budgeting, system architecture, R&D and human resources, based on case studies from a bank and recent research. We found some successful factors from discussion and they are summarized as follows:

➢ Leadership of Top Management
In order to migrate new information technology, the leadership of top management encourages transformation. There is a significant risk, and it costs a great deal when a bank builds new IT systems. Managers cannot make right decisions without a strong leadership of top management.

➢ Relationship between strategy and IT
IT itself is not strategy. Firms should use IT to complement strategy. Although it is necessary to use IT as a tool for operational effectiveness, firms should also consider using IT to create new business opportunities. In addition, IT investment does not always display its potential effectiveness. Firms should adjust not only corporate strategy, but other related issues, in order to use IT effectively.

➢ Budgeting
To encourage transformation from legacy technology to new technology, direct budget control of the top management is a useful and necessary factor. In an ordinary well-organized budgeting process, it is difficult to invest in transformation and experiments fields.

➢ Multi-Platform Architecture
In an open system world, multi-platform architecture at middleware level would provide better solutions to business units than single platform architecture such as mainframe systems. Multi-platform architecture would also be helpful to conclude arguments between individual requests from business units and integration efforts of the System Development Division.
Actually, in BTM end-user computing policy to meet individual needs was through way after multi platform policy.

- **R&D function in banking industry**
  To create new business opportunities, clearly distinguished, firm-wide business development functions are useful. On the other hand, collaboration between this group and business units which are responsible for traditional business processes is important.

- **Human Resource for IT division**
  The IT division should take advantage of outsourcing policy to catch up with rapid technology evolution. If they try to cover the whole developing process in-house, they will be left behind.

Also in this chapter, we discussed some issues related to IT investment in BTM. We summarize them as recommendations for BTM.

- **Prepare for Next IT Migration**
  The history of Japanese banking industry shows that banks cannot escape from IT evolution as its heavy users. In addition, we should predict that there is the another point of information technology inflection in the future. It means that banks need to migrate to new technology again in the future. If banks learn from their IT investment history, they should prepare for IT migration.

- **IT investment allocation to experimental areas**
  To allocate IT budget to experimental areas, BTM top management should continuously commit its budget under strong leadership. Some indicators, which many manufacturing companies are using such as percentage of their revenues, may be useful. Budgeting to experimental areas is difficult in ordinary budgeting process.

- **Grand Design of IT Architecture**
  Under a multi-platform policy, the System Development Division should
describe the grand design of the whole system architecture. Multi-platform policy may bring up low maintainability and an anarchy situation, if there is no control.

➢ **e-Business & Initiative Division**

   **Focus to seek new business opportunities**

This new division set their objectives to seek new business opportunities and did away with any IT research function. To create new business, they should concentrate their power and resource to the effort to seek new business opportunities and should not collaborate with other business units and the System Development Division to create firm-wide products and services under state-of-the-art technology.

➢ **System Development Division**

   **Establish IT R&D function and Focus to Project Management**

SDD should establish IT R&D functions to seek new information technology and shift their resource to them. The IT R&D team should accumulate state-of-the-art information technologies; disseminate it to banks and support development projects and migration.

At the same time, SDD should build a new project management standard to fit with outsourcing and multi-vender project teams.
Chapter 6 Conclusion

In this study, we have investigated a background of IT systems developments by Japanese banks and showed the three case studies about IT investment and related issues of a Japanese bank. In our final analysis, we will identify some key success factors and present our recommendations.

We show many key success factors and recommendations in our discussion. In reaching a conclusion, we categorize them into Long-Term Strategy and IT Migration Strategy.

6.1 Long-Term Strategy vs. IT Migration Strategy

We classify some of the key success factors and recommendations derived from historical studies and the three case studies as items on the strategic agenda with a vision for the long term. And we summarize them into five principles that comprise the heart of Long-Term Strategy: a strategy that is forward looking and adaptable to undefined requirements of the changing banking industry and the emerging IT environment of the future. Long-Term Strategy is characterized by its close relation to corporate strategy and IT investment policies and requires a long-term viewpoint. We conclude that Japanese banks should consider these five principles from a long-term perspective even while they are in the period of migration to new IT systems. We elaborate upon each of these principles below.

➢ "Fit" between Corporate Strategy and IT Investment Strategy

From the long-term strategic point of view, we can fairly say that the most important principle is to create "fit," or complementarities and constructive interactions, between corporate strategy and IT investment strategy. Fit drives the two strategies to mutually compliment and reinforce each other. Banks can make profits only if they use most of the resources which they possess
appropriately based on their corporate strategies. By so doing, they can accumulate IT investment as the most important resources. Therefore, banks should care about fit between them.

At the same time, banks should never forget that “IT itself is not strategy”. Banks should use IT as a means of complementing strategy although IT is the most important tool to achieve operational effectiveness and new business opportunities. In other words, IT is a powerful tool that reinforces a bank's corporate strategy.

➢ Preparation for IT System Migration

We should not be shortsighted by saying that banks will be faced with a drastic IT system migration, as Japanese banks experienced in the late 1990s, in the future. But it is safe to say that most if not all existing technologies will be taken over by new technologies, which can occasionally be very drastic revolutions as indicated in literature cited. In addition, deregulation and IT evolution will continue and these external factors will have a large impact upon the Japanese banking industry.

Therefore, banks should not think that they can avoid technology obsolescence of IT systems that they newly build and hence they should prepare for an upcoming IT system migration. It does not mean that banks should shy away from developing a large stable IT system such as a mainframe system which Japanese banks developed in the period of 1960 through 1990 but that banks should check and verify their IT systems' abilities and keep up with a trend of IT and deregulation even if they develop a large stable IT system. Even when banks are in their migration process, they should consider and prepare for “future” migrations.

➢ Establishing an R&D Function in Banks

Evolution of IT will continue in the future, and its speed will not slow down. In addition, in a deregulated environment, banks should seek new business opportunities at all times. In this connection, banks should have an R&D function in their organization with a long-term vision. Efforts made by an R&D function will support corporate strategy and IT capabilities from a long-term
Accumulation and Enhancement of IT Capabilities
To make the most of IT, it is important for banks to accumulate IT capabilities continually and keep brushing up their IT capabilities. The banking sector is one of the heaviest IT users. Even if they employ state-of-the-art IT, it is difficult for them to take advantage of it without IT capabilities, and it takes a long time to accumulate IT capabilities. We, however, do not mean that banks should employ many system analysts and programmers. Banks can use many out source for detail designing and programming process. They brush up skills such as modeling new business, understanding IT trends and developing grand system design. And enlightening for all employees about new technology is also important.

Developing and Reviewing an IT Grand Design and Standard Policy
If banks seek to gain a long-term benefit from IT investment, it is also important to develop an IT grand design and establish a standard policy with a long-term view. The mainframe integration project of BTM just after the merger of the two banks is a good example of that. IT grand designs and standard policies that banks develop will determine their IT capabilities which will be accumulated in the long run. If banks do not consider them with a long-term view, banks will end up accumulating inappropriate IT capabilities. And likewise, if banks do not develop an IT grand design and establish a standard policy with a long-term view, they cannot accumulate IT capabilities.

On the other hand, some of the factors we have identified in the three case studies of a Japanese bank are categorized into the strategy which is helpful when they consider their IT migration. We define them as IT Migration Strategy. IT Migration Strategy will complement Long-Term Strategy in the migration period. For Japanese banks, it is the first time to experience a migration of their IT systems.
We can say that our discussion based on a Japanese bank will be a useful lesson for other Japanese banks and for all Japanese banks in the future migration. They have a similar background on IT investment till 1990s. They built similar integrated mainframe systems and accumulated IT capabilities of mainframe systems in a highly regulated environment. Therefore, large Japanese banks would face the same issues, and the key success factors and recommendations derived from our historical studies and case studies will be a solution to clear them.

We conclude that the five principles of IT Migration Strategy which we have specified below will be of benefit to Japanese banks.

- **Leadership of Top Management**
  The most important thing when a bank migrates their legacy IT-based systems with new IT is leadership of top management. There is a significant risk, and it costs a great deal when a bank builds new IT systems. Managers cannot make right decisions without a strong leadership of top management. On the other hand, top management should position IT Migration as a strategic issue.

- **Controlling Budget Allocation**
  To encourage and expedite IT Migration, it is effective for banks to control their IT budget allocations. Even if banks appropriate a sufficient budget for IT investment, they tend to allocate most of it to legacy system projects because legacy systems require continuous improvements. Therefore, the budget allocation control by top management is a very important issue.

- **Building Platforms**
  It may appear ideal to build IT systems on a product basis and/or on a request basis in order to fulfill a current user request for new IT. But many unstandardized systems will cause low maintainability at a later stage. Moreover, it may delay the core system migration. Banks should build a stable and operation-wide platform at first. Then banks should develop application software on the platform. In addition, banks should consider an appropriate
number of platforms with an appropriate structure.

- **Appropriate Choice of the Technology**
Banking institutions are not technology-based unlike manufacturing firms. Therefore, banks are not sensitive about state-of-the-art IT and do not take account of IT from a long-term perspective. They may prefer conservative technology and reliable IT vendors’ solutions. They may employ the technology that close and/or well-known IT vendors provide. But they should bear firmly in mind that the choice of technology will influence their future performance in the post-1990s era. Furthermore, financial burdens that banks must bear are enormous when they migrate to another IT solution. They should consider the choice of IT from a long-term point of view, especially in the period of IT migration.

- **Leveraging Extra Resources**
To encourage and facilitate IT migration, banks should make use of extra resources such as third-party vendors and IT consultants. During the period of IT migration, banks do not have enough resources in both quantity and quality. However, banks should not provide all the resources in themselves even if the resources are strategically important.

We can summarize Long-Term Strategy and IT Migration Strategy in Table 6.1.
6.2 Relation between Long-Term Strategy and IT Migration Strategy

Finally, we show the relation between two strategies: Long-Term Strategy and IT Migration Strategy. When we consider the relation between them, it is useful to plot them on an S-curve graph mentioned in Figure 5.1. We simply assume that the evolution of the information technology will follow an S-curve such as Figure 5.1.

It is obvious that IT Migration Strategy is effective in the period of IT migration. And it is also clear that Long-Term Strategy is effective as well in the migration period. To put it more precisely, Long-Term Strategy will compliment IT Migration Strategy in the migration period. Therefore, the relation between two strategies and an S-curve is summarized as Figure 6.1.

It is also strategically crucial for banks to switch on and off complimented IT Migration Strategy according to the trend of the information technology.
When we think about the future of the Japanese banking industry, we should bear in mind the influence of both the deregulated financial industry and IT evolution. Japanese banks will experience severe competition and be requested to make a crucial strategic decision from time to time. Both of them are closely related to IT investment strategy.

Therefore, it will become a more important issue for Japanese banks how to allocate an IT investment according to trends of IT evolution.
Japanese banks will overcome the next IT migration in the future. Considering the pace of IT evolution, it will occur in the near future.

Japanese banks should always consider Long-Term Strategy which we have presented in the conclusion with a long-time viewpoint: during the period of IT migration, they should find a path in which they should follow based on IT Migration Strategy stated in this paper.
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