7.0 Recommendation on Business Intelligence System and Manpower

7.1 Introduction

Our first recommendation relates to the following issues:

- **The information on the account provided/obtained from the branches is inefficient and insufficient. Due to some ignorance of the procedures and steps to be taken in preparing transfer report on respective NPLs account by branches. Some of the NPLs accounts which are transferred from branches are in really critical condition, some of them are ageing more than 15 months.**

- **Shortage of manpower especially the Account Executive to handle the respective accounts. As a result, lack of communication between branches and the Rehabilitation Department resulted incomplete information received**

The Process Analysis above shows that the process flow has superfluous steps that make the process tedious and unnecessarily long. After an in-depth discussion and interview with the staffs of SME Bank, we discovered that a fast, efficient and cost effective, decision making tool was necessary to aid the process flow. Apart from that, we also found that there were repetitive steps and procedures in both branch and headquarters level without proper definition of work scope. Furthermore, we also found that there was room for improvement through additional manpower as well as departments.

Therefore, we will address the recommendation through three distinct views. The first view will analyze the process flow and its efficiency. This recommendation will investigate steps and procedures that are redundant, long or can be improved. Specifically, we will look into the process of rehabilitation of a particular project from its first entry of default to its subsequent liquidation or foreclosure. This analysis, however, cannot be limited to the Department of Rehabilitation at the SME Bank Headquarters alone. Since the department relies heavily on the information and feedback from the defaulter as well as branch, we will need to include the branch and defaulter variable as well.

When considering the efficiency of the process, we will look closer at the duration of the work as well as cost involved in the process. Therefore, in order to proceed with our recommendation, it behooves us to look at the current work flow to gain a little insight into the process efficiency. The document processing flow below expounds the current flow duration of rehabilitating a defaulted loan as well as the work involved in the process.

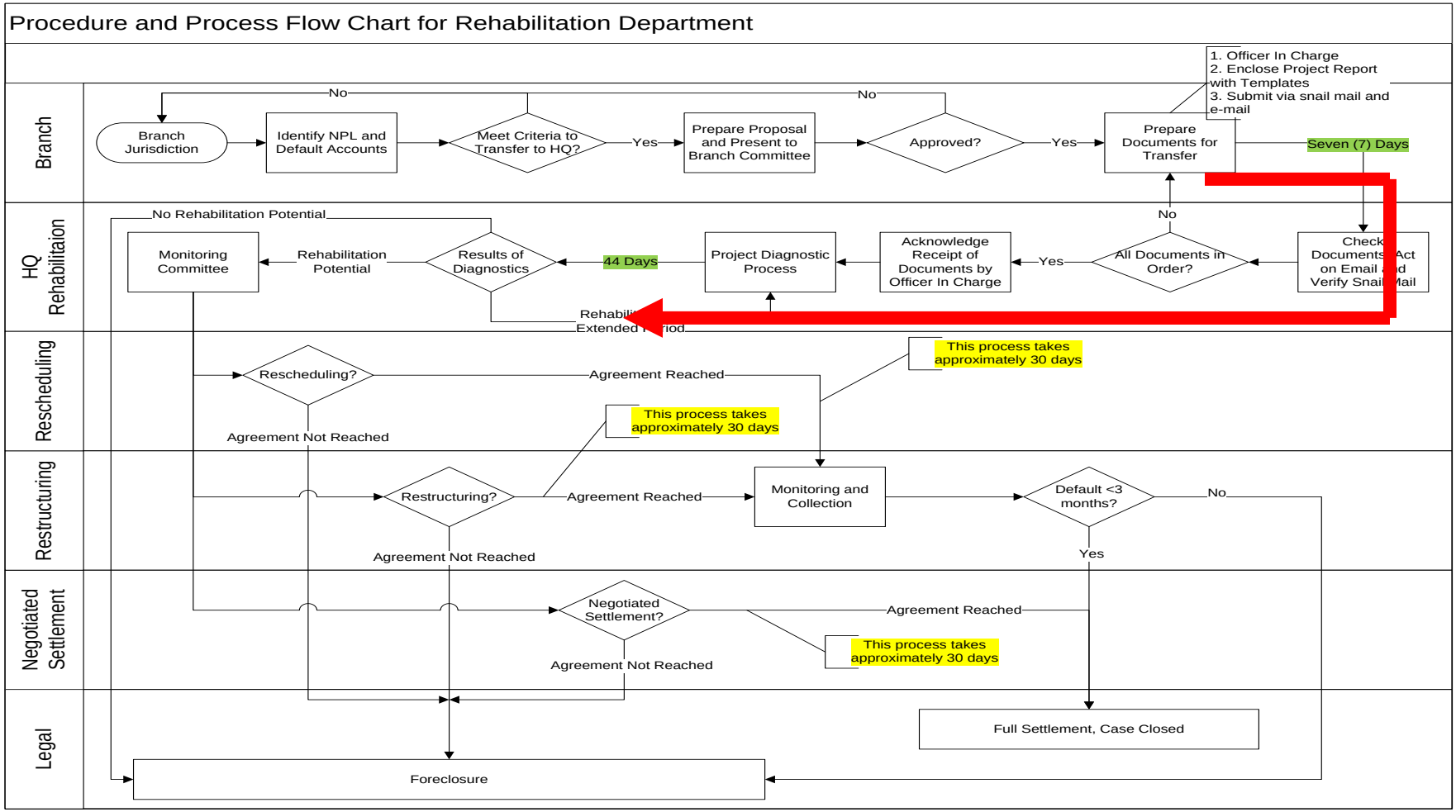

Figure 5: Component of Analysis

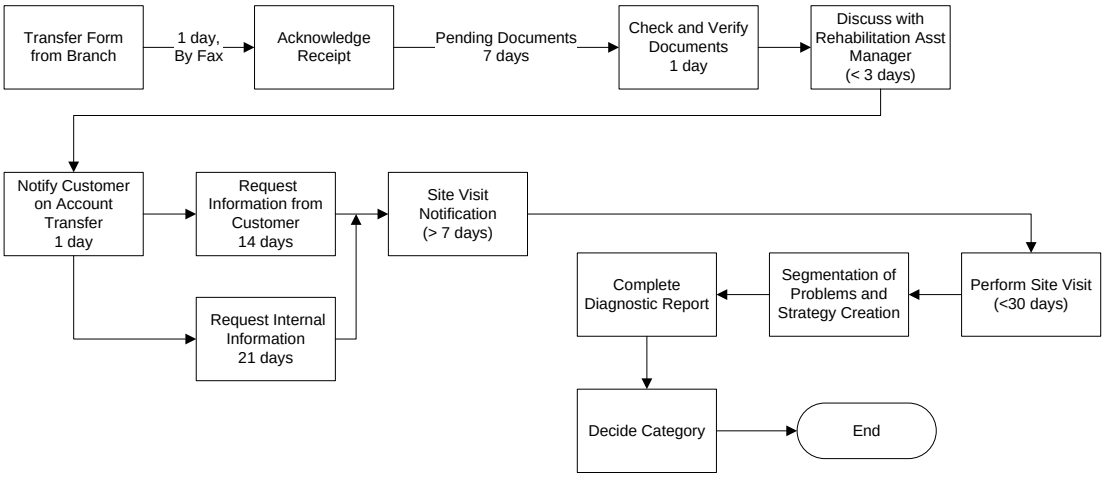

Figure 6: Current Document Processing Flow

Based on the workflow above, we recommend an implementation of a **Business Intelligence System** that will allow the documentation to be processed faster. The bank already possesses an advanced telecommunications network. This system should be connected to the network which will allow access to internal as well as external information.

Information in banking is vital. Information is used in every facet of the bank's operations. Therefore, the ability to translate technology into efficient communications and computer facilities is integral to an efficient operations and knowledge management.

Without high technology at its disposal, the Rehabilitation Department will find itself increasingly unable to handle and take care of details of complex projects. Decision making depends on many pages of documents and legal papers, instead of a coherent and consistent thought flow. In other words, information must be available quickly and accurately for effective decision making.

For the bank, as a whole, the network is considered to be a competitive weapon. For the Rehabilitation Department, it will be a time and cost saving tool. It is expected to reduce delays and errors associated with the failed project valuation. It will also help to alleviate the manpower requirements.

7.2 Characteristic of Business Intelligence System

In general terms, the **Business Intelligence System** that we propose should have a few basic characteristics:

1. **Agile, friendly and consistent human window** through which the end user will communicate with another end user. The system should allow communication between the staffs of the Rehabilitation Department and the branches.

2. **Towers of Functionality** which include real space and real time. It should be able to provide a functional system for financial analysis, risk analysis, office document architecture.

3. **Multimedia Architecture** should be included to handle and store voice, text, data, graphics image as one integrated system with the ability to search and extract.

4. **National Distributed Databases**. A database that should be available to all the branches as well as the headquarters. This will allow information sharing. For security reasons, these databases will have clones located in different locations to avoid a collapse of the main database.

With this system, the decision making officer will not only depend on the available information but also be aided by information that is stored, processed and analyzed by expert systems running on computers. The successful implementation of this system relies heavily on its level of integration with the existing systems. It must work as one system to ensure a seamless information stream.

Therefore, this system should:

1. **Offer a competitive edge to the department**
2. **Promote innovation in workflow and diagnostic reports**
3. **Support one logical network, no matter how many physical networks there may be**
4. **Provide any-to-any connection**
5. **Feature peer-to-peer solution**
6. **Help reduce communications costs**

7.3 Process flow of Business Intelligence System

7.3.1 Preparing Document for Transfer

Referring to Figure 4, the first step in the rehabilitation workflow involves the branch sending the transfer form to the Rehabilitation Department through fax. The Rehabilitation Department will acknowledge receipt of the transfer form, but no action will be pursued. The other relevant documents will be sent through snail mail to the Rehabilitation Department, which will arrive in approximately seven days later. The Rehabilitation work will only begin after these documents are received by the department.

The Business Intelligent system will have an interface at the branch. This interface will allow the branch officer to open an NPL Transfer Form function and input relevant data. In this case, the branch officer will open a new delinquent account in the system. We will name this account NPL Account. He will subsequently scan the transfer form as well as the required documents and store them in the Intelligent System which will link the scanned documents to the NPL Account. Since it acts as one system, the NPL account will automatically extract all information from the Loan Management System and store it with this new NPL Account created for the

defaulted customer. Furthermore, the integrated system will allow this to happen automatically without the need for additional data entry.

Once the documents are scanned and the relevant data is entered, the branch officer will need to submit the account. The system will have an internal checklist which will verify if all the relevant documents have been scanned and included before submission. This will ensure that the submitted documents are complete. In other words, information regarding the market of the project, finances, technical capabilities as well as management must be submitted along with the Transfer Form in the system.

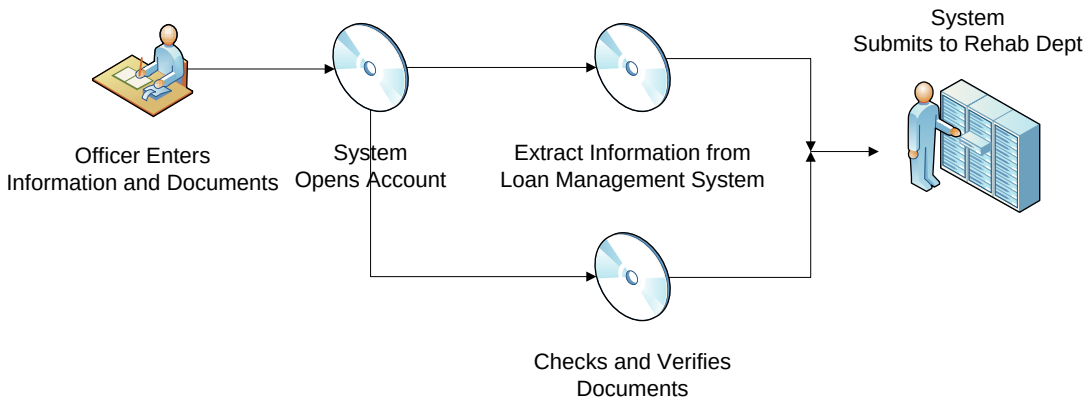

Figure 7: Document Transfer

7.3.2 Document Transfer

With this system, the Rehabilitation Department receives the documents within 1 day and is able to start the work process earlier. Furthermore, it also eliminates the checking and verifying step as we saw in Figure 4. Once the branch officer submits the account through the system, the system will send an email to the Manager in the Rehabilitation Department for further action. Since we have shortened the time and we have eliminated Check and Verify step, we obtain the following process flow:

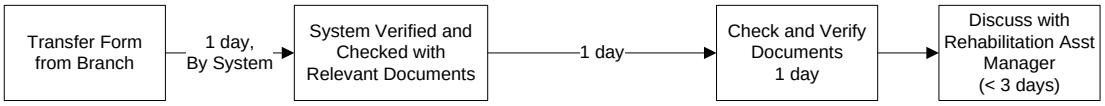

Figure 8: Transfer Process through Business Intelligent System

As can be seen above, once the account is received, the status of the account will be “Pending Asst Manager Assignment”. The Manager will need to assign an Assistant Manager to solve the account and prepare a diagnostic report. This will also require a discussion between the Manager and Assistant Manager. The system will have an internal clock which will remind the Manager on a frequent basis to resolve the pending status within a certain

period of time. This is an added advantage as the system can store the efficiency of the Manager in assignment and discussion. Since a report can be generated on the Manager's efficiency and performance, it will provide motivation for the manager to assign and discuss the project faster than 3 days. Furthermore, the manager will have all the necessary information at his fingertips since it is stored in the system.

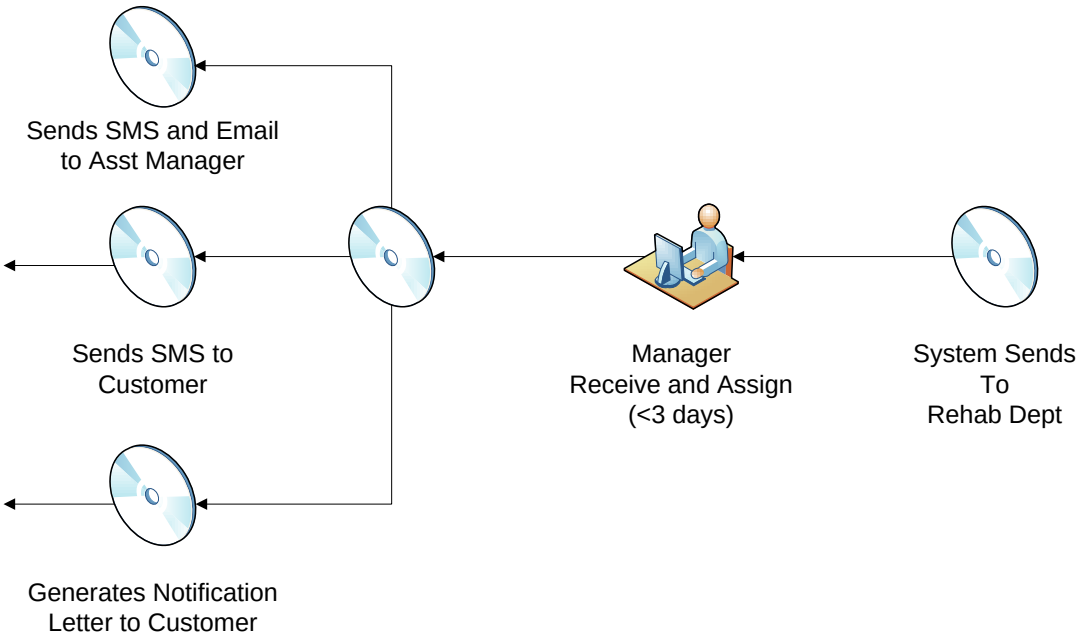

Figure 9: Notification Process

7.3.3 Notification Process

As can be seen above, once the Manager assigns, the system will automatically send an email and a message through Short Messaging System (SMS) to the Assistant Manager's mobile phone. It also generates a Notification Letter to the Customer as well as sends a message through Short Messaging System (SMS) to the customer's mobile phone. These steps are automatically performed by the system which eliminates additional work by the department.

Once the Assistant Manager receives the instruction, he/she will need to prepare a Diagnostic Report. To prepare this report, internal information as well as external information is required. The external information includes meeting with the client to extract the problems encountered and obtaining other relevant documents such as asset listing.

7.3.4 Information Gathering

Traditionally, the external information gathering is the most difficult part of the process. This occurs because the defaulter avoids and ignores bank collection and rehabilitation officers. The defaulter also refuses to cooperate in many cases. Therefore, the information will still need to be collected manually through negotiation and tracking the customer. The system, however, will have an in-built condition tracker which the Assistant Manager can switch on. If this condition is switched on, the system understands that there are external documents still pending and it will automatically generate a reminder letter to the customer at day 7 and day 14 after the first notification.

Internal Information can be obtained through the system. The system should possess a “Request for Internal Information” function which will send an email requiring information regarding the customer to various departments. Previously, the Assistant Manager had to negotiate to obtain the information from the departments. However, with this system, we are able to track the cooperation exhibited by the necessary departments. The information will be uploaded to the system or provided to the Assistant Manager. Information such as Issues and Rehabilitation Plan Report for the customer and Project

Transfer Report can be uploaded. Documents such as the Project's Financial Report and Project Fails will need to be entered manually.

Traditionally, both the internal and external information gathering is conducted by the Assistant Manager. However, we also recommend additional staff to be hired for information gathering and data entry. We will name the additional staff as Accounts Executive. Since the Assistant Manager has more than one diagnostic report to complete at any given time, the accounts executive will be able to take the responsibility of gathering external information, site visit and data entry.

Therefore, we believe that the current external information gathering duration will be reduced from 14 days to 7 days since there will be a full time executive to focus on it. Site Visit will become part of the external information gathering. We also believe the internal information gathering duration will also be reduced from 21 days to 14 days since the Assistant Manager will be aided by the system in gathering information from the internal departments and he/she will not be involved in external information gathering.

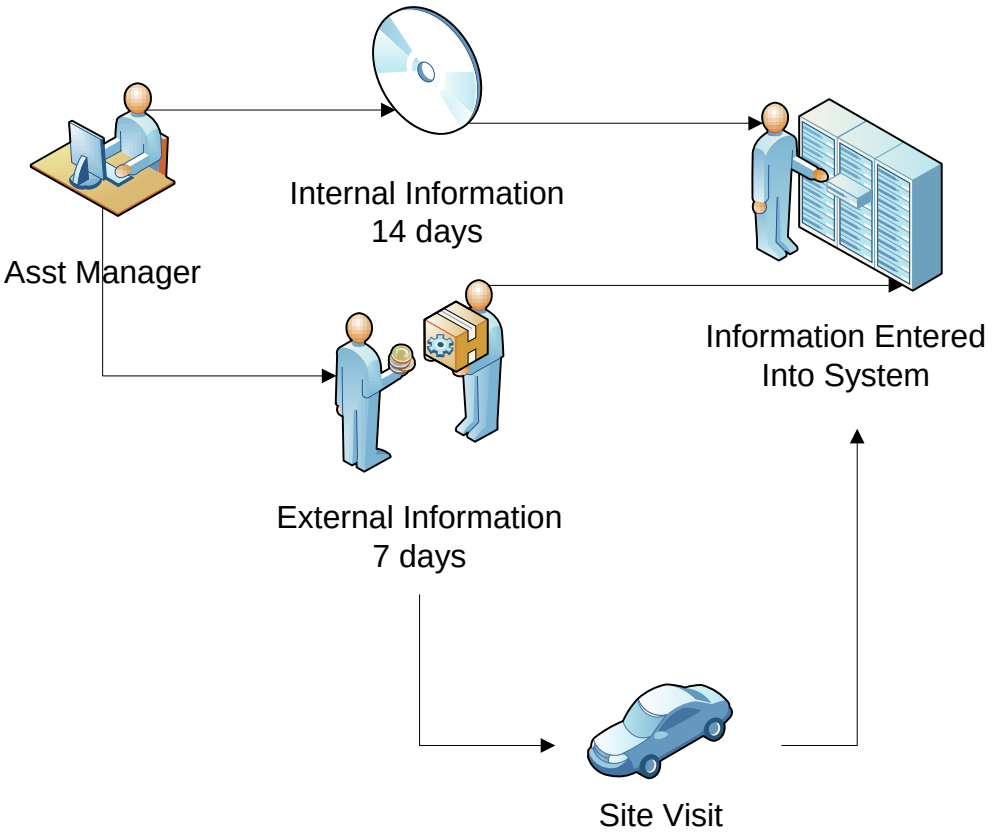

Figure 10: Information Gathering

The internal and external information along with results from the site visit will be entered into the system by the Accounts Executive. The system will then perform segmentation of problems and a basic strategy creation automatically. The Assistant Manager will run the report and add any relevant information. The Assistant Manager, with the aid of the intelligent system, will decide whether the next course of action will negotiated settlement, restructuring or rescheduling. ***The completed system will essentially be the work flow below:***

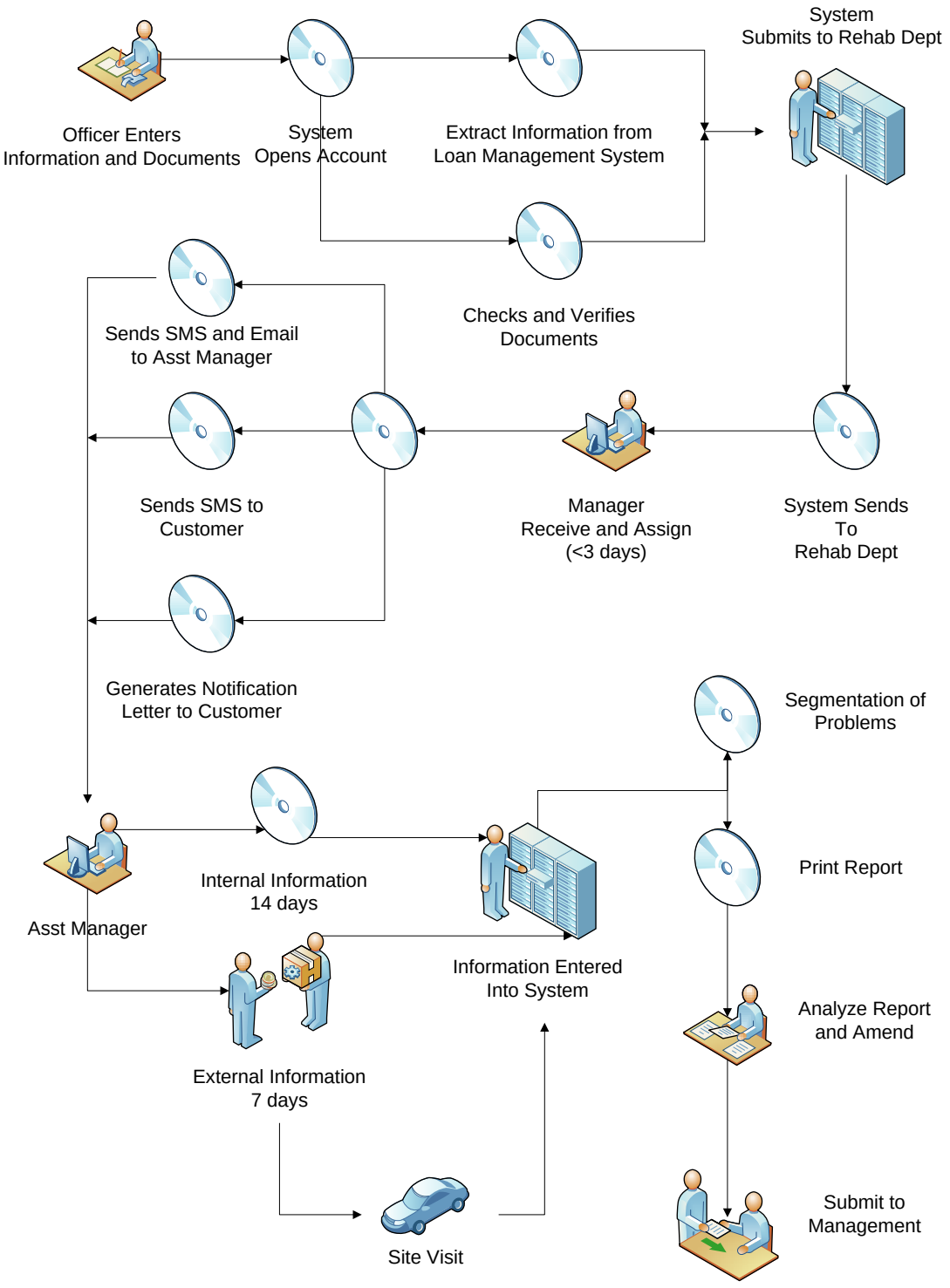

Figure 11: Workflow with Business Intelligence System

7.3.5 The Improvised Process Flow with Business Intelligence System

The workflow in terms of processes is delineated as below:

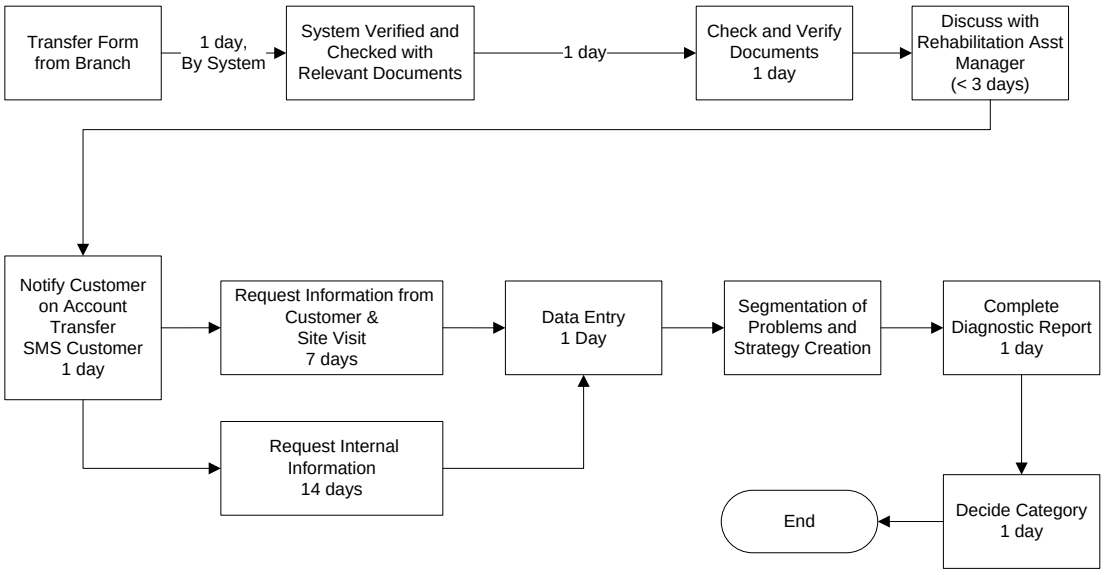

Figure 12: Revised and Improved Process Workflow with BIS

As can be observed, six days are saved by starting the work using scanned documents from the Branch, seven days are saved by hiring additional manpower i.e. Accounts Executive to handle the external gathering while seven days are saved by using the system to gather internal information. Therefore, a total of 20 days are reduced in this new process by implementing a business intelligent system and hiring additional manpower.

Traditionally, it takes 44 days to process the documents before reaching the Segmentation Process. However, in the new process, it will only take 22 days to reach the Segmentation Process. This is a 50% reduction in processing time with the aid of an intelligent system and additional manpower. Furthermore, this reduction is considered the worst case scenario since Checking and Verifying Documents as well as sending Notifications does not generally require one day. It can be completed within second with the existing technology today. The report and decision making is also aided by the intelligent system.

7.3.6 The Expert System – Benefits and Drawbacks Consideration

The report generation by the System, from the information entered and collected throughout the work, is the gist of the whole implementation. This particular process allows the system to be called an *Expert System*.

Expert Systems have emerged from the research laboratories and headed into commercial, industrial and financial applications. The business machine has not only led to excitement in the Information Technology industry but also led to an impressive list of practical applications. Expert systems are concerned with cognition process. “They are software packages that experts

in specific fields enrich with their knowledge. They do so by distilling their expertise into a set of rules, entering such knowhow into the system. Top experts produce application programs which help lesser experts to solve problems in specialized – domain specific – fields, by responding to the program queries." [Chorafas]

The important criterion of our system is that it should be interactive. It prompts the user as well as responds to his/her demands. Current data processing technology allows the system to give advice and justifies its advice by backtracking to the rules which was used to arrive at the conclusion. Therefore, the BIS could be programmed to function according to the rules recommended and designed by the Rehabilitation Department itself. Furthermore, the Diagnostic Report can be generated based on the preset rules, feedback and interaction between the user and the system.

The set of rules or the *inference engine*, is the driver of the system from premise to conclusion. Probability theory, Bayesian Approaches and the other theories can be used in building the inference mechanism that will drive the system. Though the Rehabilitation Department does not need to know the details of the inference engine, they should understand the process to ensure that future systems and solutions providers understand the system. Existing

expert systems in other industries are practical solutions which are able to handle fairly complex problems. It has been proven to “tackle issues requiring high level of human judgment and expertise. It communicates with its user through an effective dialog.” [Chorafas]

Despite our proposal to implement this system, we should also advise the necessary requirements to implement such a system. Expert systems can only be successfully implemented in Banking if certain conditions are fulfilled. These include:

1. **A proper cultural environment that appreciates machine intelligence**
2. **A practical and sufficient know-how in both design and in application along with a necessary commitment to information sharing**
3. **Network availability for online connectivity of the expert systems to national databases**
4. **Proper security measures are taken into account. Necessary firewall and anti-virus protection must be installed.**
5. **Disaster recovery plans must also be implemented including a comprehensive back-up storage server and disk space.**

As mentioned in our background research, work cultures that are not appreciative of information sharing will not be able to successfully integrate the expert system into their department. It is worth repeating that in most cases, knowledge management systems are required to gain a competitive edge. In the case of the rehabilitation of loans, the knowledge system should cater to salvaging the remainder of the loans.

Another point to consider is the bottleneck in the processing flow. We expect a congestion of information uploaded at branches due to the amount of documents that need to be scanned. However, this can be avoided by employing a Wide Area Network which processes the information through the network. Furthermore, we expect the frequency of documents to be low and therefore, no congestions should occur.

As Fraser (2008) aptly puts it, “the challenge faced by traditional retail *banks* is that markets continue to shift; large financial institutions no longer gain an advantage based on economies of scale, because size and vertical organizational structures result in operational costs five times greater than the

costs of nontraditional *banks.*" Therefore, these changing times require the banks to look at effective ways to gain competitive edge – particularly in the information arena.

The Rehabilitation Department should take into consideration the following three basic rules of knowledge engineering before embarking on the arduous project of implementing an expert system. It should always keep in mind the following:

1. **The expert system must be simple in their conception. Rules can be added as easily as it can be removed. The programming language used can be understood across suppliers of expert system.**

2. **The expert system must be effective in providing the necessary information for the particular user. It must be proven to be helpful and aid the employee and not slow him/her down.**

3. **The expert system must be comprehensive to the user. The system must be adapted to the computer skills of the employees. Language will also need to be considered.**

4. **The expert system must be able to be integrated into the existing framework seamlessly and additional infrastructure will need to be planned carefully.**

The Department should avoid using artificial intelligence which is very theoretical and uses polyvalent approaches in decision making. Though it is known for its accuracy, maintenance as well as upgrading could be costly and expertise is rare.

Chorafas states that knowledge management rests on simple foundations which are completeness, power, simplicity and integration. The expert system must be complete and offers all the necessary decision making tools for the employee. It must empower the employee to decide based on the information available. It has to be simple to use and easy to learn.

It has to be fully integrated with other systems for easy access to information. Integration essentially means the ease of moving between various functions and systems. This also involves making different components appear similar to each other. Integration also involves the use of compatible protocols, identical subroutines, common files and well designed interfaces.

The Rehabilitation Department will also need to consider the construction of a Database Server which will store all the relevant uploaded documents. The server will contain all the historical data including decisions made and how problems were solved. The “knowledge bank” must be comprehensive and allow search and extract functions. Furthermore, rules and methodologies in the knowledge bank and applications must be comprehensive as well as complement each other.

The expert system to be implemented by Rehabilitation Department must contain the following:

1. **All the employees in the department as well as rehabilitation officers in the branches should be equipped with it.**
2. **A copy of the application should be available in the workstation computers.**
3. **No employee can access or work in the system without signing in and registering with the system. This is to ensure security is preserved.**

4. **All the workstations of the Rehabilitation Department and the Branch Rehabilitation Officer should be linked into a network and connected to the main Bank's database and systems.**

Our proposal to implement a **Business Intelligent System** cannot ignore the cost of implementing such a system. For leading banks, advances in technology during the last decade exhibited more significant productivity increase. The Rehabilitation Department will not only need to analyze the past successes but also examine the implementation through critical evaluation of investments.

Some questions that the Rehabilitation Department needs to consider include:

1. **Is there budget allocation for technological investments?**
2. **Are men or technology more expensive?**
3. **How fundamental is the department at reducing costs through technological advancements?**
4. **How successful was the department in previous technological implementations?**

5. **How does the department rate its ability to invest in humans and technology?**

The questions are too many to list, but the Rehabilitation Department will need to consider the ramifications of the investment in new technology and therefore, need to know in-depth of its own requirements and needs. IBM uses a rule of thumb: With technology implementation, expenses must rise slower than the increase in business. We believe that the Business Intelligence System will add value to the Rehabilitation Department because it helps to establish economies of scale. Large amounts of data can be processed, and executed within a short period of time to allow higher collection of default debts within a fiscal year. Therefore, the profitability should increase. Apart from that, it has been proven that online expert systems reduce paper usage between 10% and 33% per year if the paper system is displaced and fully integrated computer systems are employed.

Expert system in the Rehabilitation Department also creates an insurmountable barrier to entry for competitors. Though SME Bank does not have any competitors, it gives the bank an advantage to roll its money through effective loan rehabilitation. As mentioned earlier, the higher the

repayment and rehabilitation per year, the more the cash that will be available for further loan issuance.

By implementing the BIS, the information on the account provided/obtained from the branches is verified before submission and therefore, efficiency and sufficiency is increased. With the BIS, the NPL can be transferred fast and efficiently processed to avoid backlog and critical accounts. By hiring Accounts Executive, the shortage of manpower is resolved. Aside from that, the executive will also reduce the processing time for the rehabilitation process. As a result of lack of communication between branches and the Rehabilitation Department, incomplete information is received. This is solved by the accounts executive and the BIS.

8.0 Collateral Management Unit

8.1 Introduction

Our second proposal relates to the following issues faced by the department:

- **The Bank's current process flow is limited to rescheduling and restructuring (debt restructuring) the NPL only. This defeats the purpose of its existence.**