NETWORK PLANNING AND MANAGEMENT

OF

STANDARD BANK LIMITED

SUBMITTED TO

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ABSTRACT

The report entitled “NETWORK PLANNING AND MANAGEMENT OF STANDARD BANK LIMITED ITS Division of SBL Limited” is the indication of my internship, which I have done in SBL Limited. During my internship, I was assigned to work at the ITS Division, Head Office, SBL Limited. The purpose of this intern report is to document the requirements and part of an IT support manual for the ITS Division of SBL Limited. This division is responsible for providing all technology trouble shoots, changes, improvements required etc. This manual will be a training tool for the new employees of this division and a guideline for practices. Based on this manual some policies and practices might be documented as standard operative procedure. The main limitation was the unavailability of similar manuals and strong guideline to prepare the manual. By time this report is submitted it is believed that little had been achieved as there is no specific detail of the requirements of the manual.

ACKNOWLEDGMENTS

I would like to show my humble gratitude to all of the individuals who have helped me to prepare this report during the last months. As being a human being, it is natural to forget and few names may not be mentioned unmindfully. I would like to apologize for my forgetfulness.

I take the opportunity to express my sincere gratitude and respect to Ms. Alkona K.Choudhri, SAVP, Human Resources, as well as Mrs. Haider Nurun Nahar, officer, HRM, SBL Limited for accepting me to work in this renowned Bank. My heartfelt thanks go to Mr. Sabbir Ahmed, Head of Network, ITS Division, SBL Limited for constant support, guidance and supervision on my work in SBL Ltd. Thanks to Md. Tarikul Azam, Senior Officer, as well as, Mr. Aminul Islam, Junior Officer for providing relevant information and data related to IT solutions.

My heartfelt thanks and gratitude for all of those instructors of IUB with whom I did courses and who have given me the valuable education to help me in the practical working life. I have the honor to thank my parents for their ever loving and caring support which can never be expressed in words.

Finally, I express my special gratitude to my honourable teacher, Mr. Mohammad Noor Nabi, for his supervision in preparing the report. He has guided me in coordinating the whole report. He has spend time to check the draft report and given his suggestions on different chapters of the report. Without his help, it would have been difficult to prepare a comprehensive report.

Contents

1.1 Objective of internship

Internship is known as gaining sensible experiences from the different Organizations that helps a lot to make a relation between the theoretical and practical knowledge. Internship is six credit compulsory courses for the students graduating from Independent University, Bangladesh (IUB). A student from School of Engineering and Computer Science (SECS) should go for these six credit hours practical course that is related to their relevant field. It's very important because it is the first time for a student to acquire a keen practical knowledge from the different organizations. As a student of Computer Science of Independent University, Bangladesh (IUB) I have studied a lot of programming courses during last four years. But on the other hand I had only one course of networking. This is insufficient to know the total knowledge of computer networking. As a result to get sound knowledge of computer networking I was interested to do my internship on Network Planning and Management that covered a lot of ideas of networking. So when I got a chance to do my internship at stander bank (SBL) my dream has come true. I was appointed as a Network Monitor at ITS division. My project paper is "Network Planning and Management of SBL". This report covers the whole project, which I have learnt during the Internship period. This report will be helpful for those who want to learn more about Banking Network design And Management.

1.2 About SBL Limited

The Company was incorporated as a Public Limited Company in 1999, under the Companies Act 1994, with an Authorized Share Capital of BDT 1,000,000,000 divided into 10,000,000 ordinary shares of BDT 100 each. At present, the Authorized Share Capital of the company is BDT 10,000,000,000 divided into 1,000,000,000 ordinary shares of BDT 10 each.

The Company was also issued Certificate for Commencement of Business on the same day and was granted license on October 05, 1999 by Bangladesh Bank under the Banking Companies Act 1991 and started its banking operation on October 24, 1999. As envisaged in the Memorandum of Association and as licensed by Bangladesh Bank under the provisions of the Banking Companies Act 1991, the Company started its banking operation and entitled to carry out the following types of banking business:

Wholesale Banking

Retail Banking

International Trade Financing

Small and Medium Enterprises (SME) Banking

NRB Banking

Privilege Banking

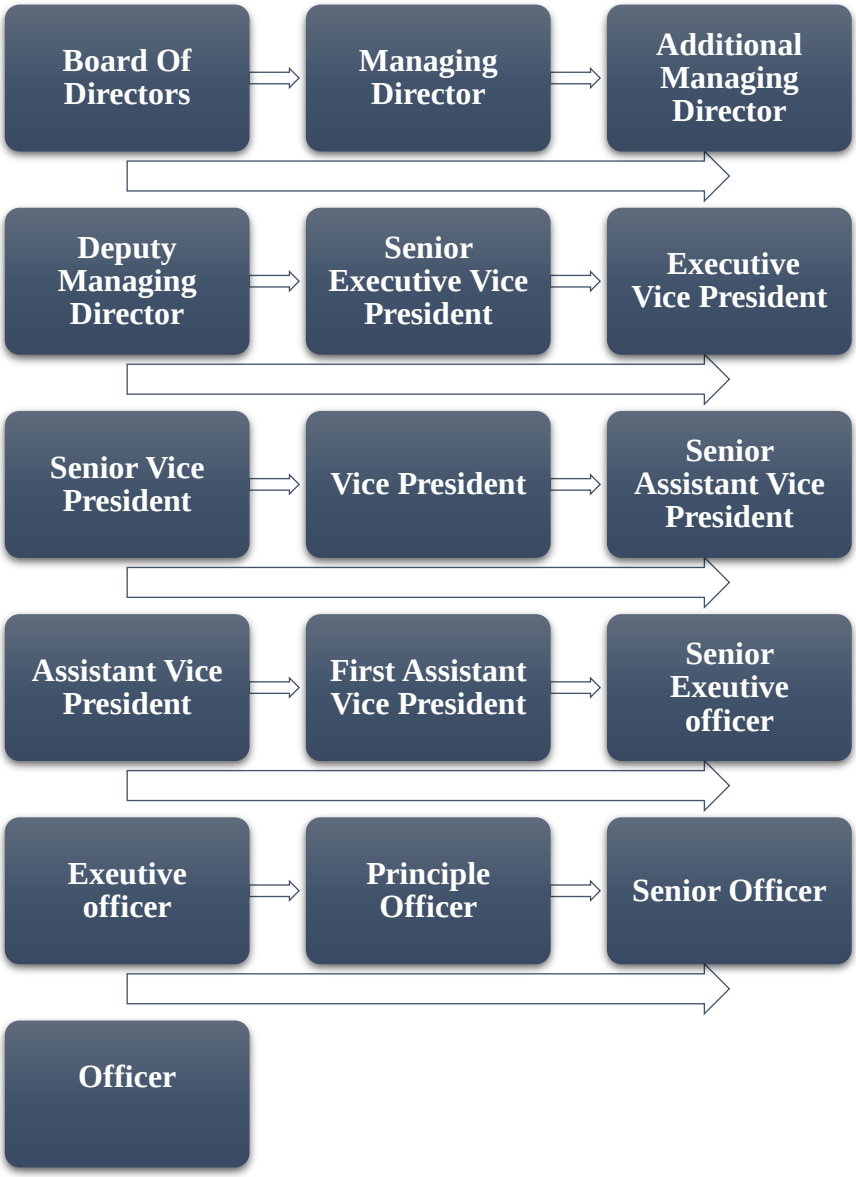
Card Services

Treasury Operations

The Company (Bank) operates through its Head Office at Dhaka and 128 branches. The Company/ Bank carries out international business through a Global Network of Foreign Correspondent Banks.

1.3 Organogram of IT Division

The IT Division is responsible for all type of IT related problem, support and solution. According to the organogram the head of the department is Executive Vice President (EVP). He has sub-ordinate Senior Vice President (SVP), Assistant Vice President (AVP), Junior Assistant Vice President (JAVP), Senior Officer(SO), Officer, Junior Officer(JO), Assistant Officer(AO), and Sub-staffs. The IT Division is one of the departments of head office of **SBL** Limited. The address of ITS Division is SBL centre Motjheel Corporate Branch. The Organogram of the ITS Division is given below.



1.4 Project Objectives

The following are the broad objectives of this internship project.

- ¾ To study information technology support division activities of **SBL** Limited.
- ¾ To gather wide range of knowledge about information technologies in use.
- ¾ To find out the problem, solution and requirements specification regarding information technology support.
- ¾ To develop an information technology support manual for this organization.

CHAPTER TWO

LITERATURE REVIEW

2.1 Network Cable

Cable is the medium through which information usually moves from one network device to another. There are several types of cable, which are commonly used with LANs.

1. Unshielded Twisted Pair (UTP) Cable Twisted pair cabling comes in two varieties: shielded and unshielded. Unshielded twisted pair (UTP) is the most popular and is generally the best option for networks.

2. Fiber Optic Cable

Fiber optic cabling consists of a centre glass core surrounded by several layers of protective materials. It transmits light rather than electronic signals eliminating the problem of electrical interference. This makes it ideal for certain environments that contain a large amount of electrical interference. It has also made it the standard for connecting networks between buildings, due to its immunity to the effects of moisture and lighting.

Advantages of Optical fiber systems:

Easy Installation and Upgrades Long lengths make optical cable installation much easier and less expensive. Optical fiber cables can be installed with the same equipment that is used to install copper and coaxial cables, with some modifications due to the small size and limited pull tension and\ bend radius of optical cables. Optical cables can typically be installed in duct systems in spans of 6000 meters or more depending on the duct's condition, layout of the duct system, and installation technique. The longer cables can be coiled at an intermediate point and pulled farther into the duct system as necessary. Non-Conductivity Another advantage of optical fibers is their dielectric nature. Since optical fiber has no metallic

2.2 Cabling

Network design we are using UTP (Cat5) and Fiber Optic Cable. For its Backbone, the link which is from Network Operation Center (NOC) we are using Fiber Optic Cable for high Transmission data rate. The rest of the network is connected using UTP.Standard Bank Ltd. uses fiber optic cable for connecting the main building to the other buildings. In analyzing the current market price of fiber optic is little high, but the cost of fiber optic is dropping making high-speed communication to the desktop more affordable. 1. 10 Base T / 100 Base T Straight 10BaseT and 100BaseT are most common mode of LAN. We can use UTP category-5 cable for both modes. A straight cable is used to connect to different devices.

2.3 TCP/IP

TCP/IP (Transmission Control Protocol/Internet Protocol) is the basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet). When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP. TCP/IP is a two-layer program. The higher layer, Transmission Control Protocol, manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. The lower layer, Internet Protocol, handles the address part of each packet so that it gets to the right destination. Each gateway computer on the network checks this address to see where to forward the message. Even though some packets from the same message are routed differently than others, they'll be reassembled at the destination.

2.4 IP Addressing

Every machine on the Internet has a unique identifying number, called an IP Address. A typical IP address looks like this: 216.27.61.137 To make it easier for us humans to remember, IP addresses are normally expressed in decimal format as a "dotted decimal number" like the one above. But computers communicate in binary form.

Look at the same IP address in binary: 11011000.00011011.00111101.10001001 The four numbers in an IP address are called octets, because they each have eight positions when viewed in binary form. If you add all the positions together, you get 32, which is why IP addresses are considered 32-bit numbers. Since each of the eight positions can have two different states (1 or 0) the total number of possible combinations per octet is 28 or 256. So each octet can contain any value between 0 and 255. Combine the four octets and you get 232 or a possible 4,294,967,296 unique values! Out of the almost 4.3 billion possible combinations, certain values are restricted from use as typical IP addresses. For example, the IP address 0.0.0.0 is reserved for the default network and the address 255.255.255.255 is used for broadcasts. The octets serve a purpose other than simply separating the numbers. They are used to create classes of IP addresses that can be assigned to a particular business, government or other entity based on size and need. The octets are split into two sections: Net and Host. The Net section always contains the first octet. It is used to identify the network that a computer belongs to. Host (sometimes referred to as Node) identifies the actual computer on the network.

2.5 Scope of Work as Intern

During my internship, I was assigned to work at the IT Division of SBL. I worked in their hardware and LAN section and give them support about computer hardware maintenance and troubleshooting. My responsibilities were to find out problems and their solutions of computer and organize their work and support in a manual.

If the IT support manual can be organized successfully, it will help the employees to gain a primary idea about the computer problem and support. It can be a guideline for the IT professional working in this division. It will help management to assist in taking fast decisions and giving support to the overall organization.

CHAPTER THREE

NETWORK PLAN
Introduction

3.1 Network Plan or Layout

After finishing some preliminary works we were all busy to draw a network plan for this project. They have also given me an opportunity to draw a network plan for this project. This was not a difficult job because all the specialists were there to assist me. They were very cooperative and gave me every opportunity possible to work and gather experience. During the time of my internship tenure I have drawn a network plan for this project. Here is the network plan:

3.2.1 Network

SBL limited use Local Area Network (LAN) in their data centre, Branch and divisions. This network is build using some hardware like hub, switch, router and Firewall. SBL Limited is connected their corporate head office to every branch and ATM in country wide they take service from different Internet Service Provider(ISP). All ISP have their hub in country wide and branch are also connected by near hub. Branch are connect by one ISP and branch ATM connect by another ISP and branch ATM have their internal connection. If branch ISP connection is failed then branch can active by ATM ISP connection as same as if ATM ISP connection is failed then ATM can active by branch ISP connection. SBL limited use Radio and wireless for their branch and ATM in remote areas. They also use SIM in ATM which is provide by telecom company e.g. Grameenphone, Robi, , Airtel and Banglalion,Qubee.

SBL online banking system is very Strong for this purpose they are building a Data Center and connecting their every branch by Wide Area Network (WAN). This Data Centre is being developed by third party vendor named Square Infor matrix. The Wide Area Network (WAN) between the Data Centre and all the branches and divisions are being connected by fibre optic cable and radio link. SBL using PRTG software for network monitoring purpose and they have also an web based application for network monitor which called NMS(Network Monitoring System) Which is developed by SBL. They can monitor ISP link, Router by using these applications.

Proposed network Diagram

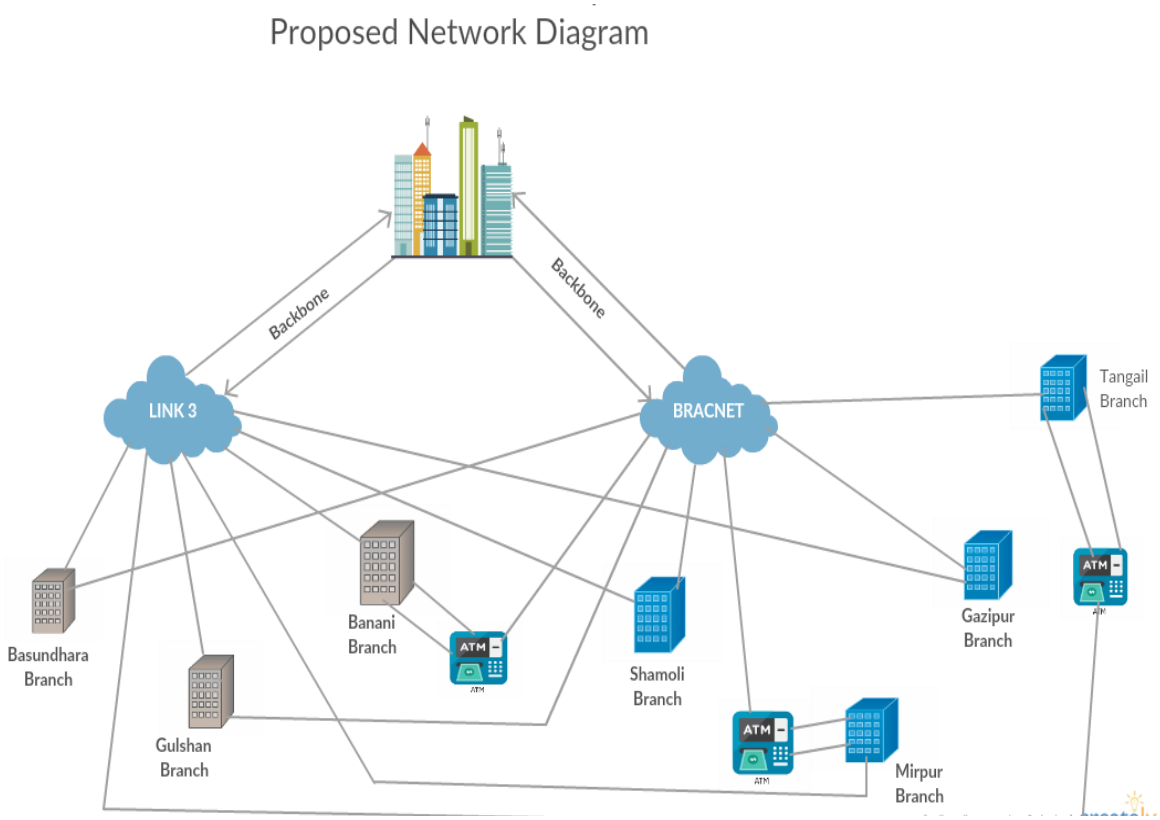


Figure 1SBL Country Wide Proposed Network Diagram.

3.2.2 Data Center

SBL has two more data centre for recovery purpose. Data centre are connected one to another by **Dark Fiber** cable and Dark fiver is connected point to point. Dark Fibber often has better signal strength and is more immune to interference than the fibre making up traditional networks They have three DC Main DC, Near DC, Far DC. Main data centre is their Gulshan corporate office Near Data centre is situated SBL centre Bangla motor and Far Data centre is situated Kashimpur. If one data centre is destroy by any reason then they can recover their customers data from another data centre. SBL Limited developed their data centre by third party vendor. Every new transaction and all new clients information are update and store in Main Data centre. They update their near DC after one day and they also update data in their far DC in every one week. SBL use **DMZ(**demilitarized zone) firewall in their data centre.

SBL Data centre design

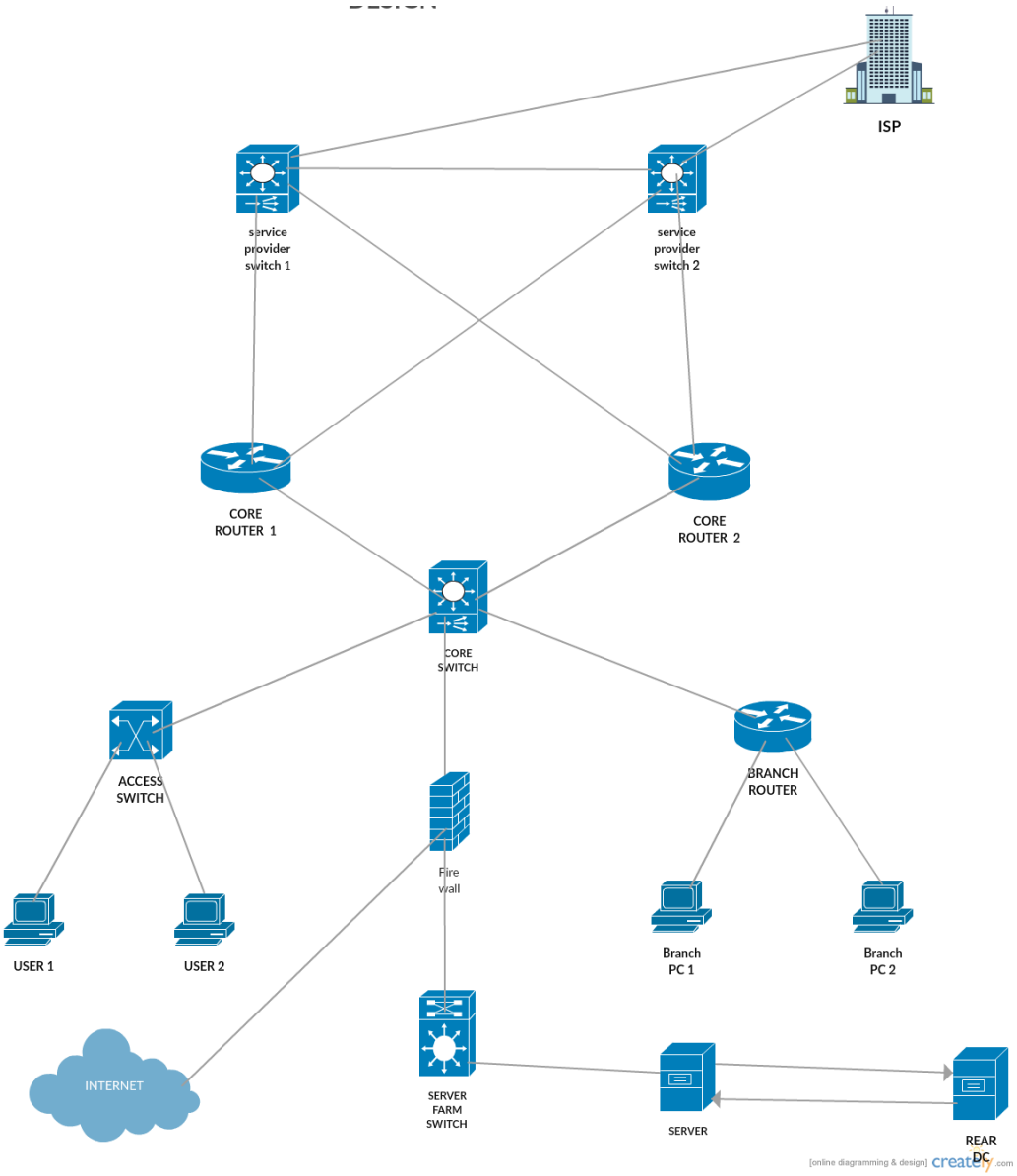


Figure 2 SBL Data Centre Design

CHAPTER FOUR

BRANCH LAN DESIGN

Introduction

4.1 The Hierarchical internetworking:

The Hierarchical internetworking model is a three-layer model for network design first proposed by Cisco. Bank branch's data centre network is logically divided into three layers: core, distribution, and access layers.

Core layer:

The core layer is a high-speed switching backbone and should be designed to switch packets as fast as possible. This layer of the network should not perform any packet manipulation, such as access lists and filtering, that would slow down the switching of packets.

Distribution layer:

The distribution layer of the network is the demarcation point between the access and core layers and helps to define and differentiate the core. The purpose of this layer is to provide boundary definition and is the place at which packet manipulation can take place. In the campus environment, the distribution layer can include several functions, such as the following:

- Address or area aggregation
- Departmental or workgroup access
- Broadcast/multicast domain definition
- Virtual LAN (VLAN) routing
- Any media transitions that need to occur
- Security

In the non-campus environment, the distribution layer can be a redistribution point between routing domains or the demarcation between static and dynamic routing protocols. It can also be the point at which remote sites access the corporate network. The distribution layer can be summarized as the layer that provides policy-based connectivity.

Access layer:
The access layer is the point at which local end users are allowed into the network. This layer may also use access lists or filters to further optimize the needs of a particular set of users. In the campus environment, access-layer functions can include the following:

- Shared bandwidth
- Switched bandwidth
- MAC layer filtering
- Micro segmentation

In the non-campus environment, the access layer can give remote sites access to the corporate network via some wide-area technology, such as Frame Relay, ISDN, or leased lines. function optimally, hierarchy must be maintained.

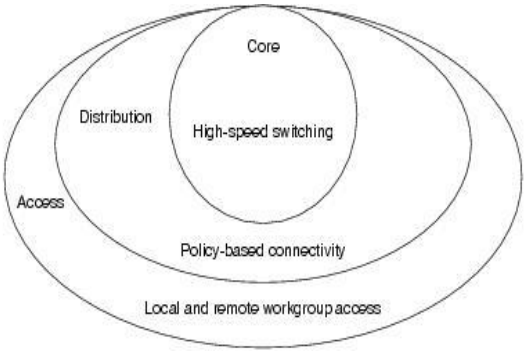


Figure 3 Hierarchical network design

4.2 Logical Design:

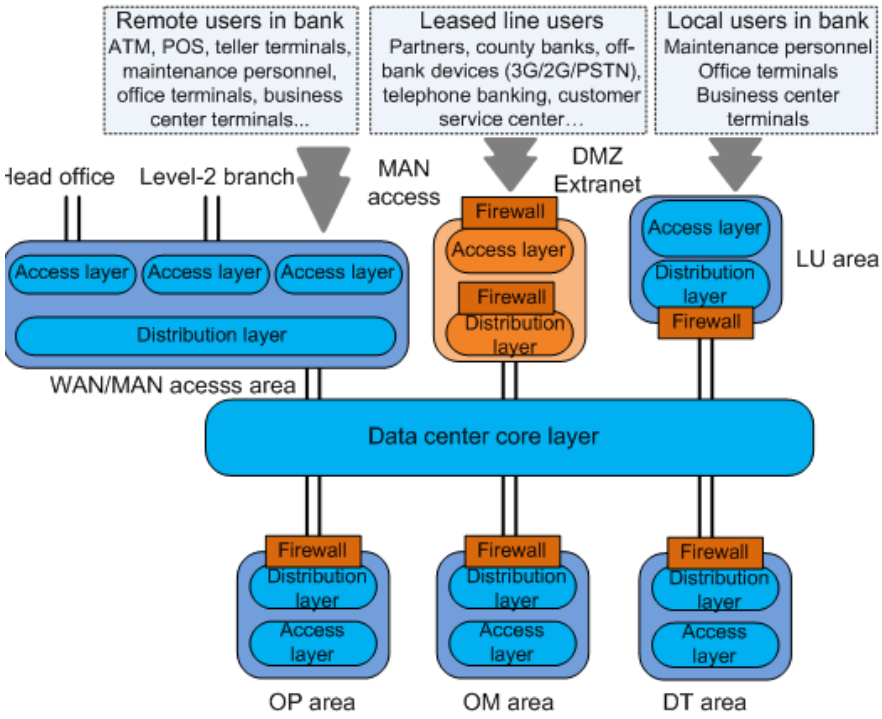


Figure 4 Physical Design

4.3 Physical Design

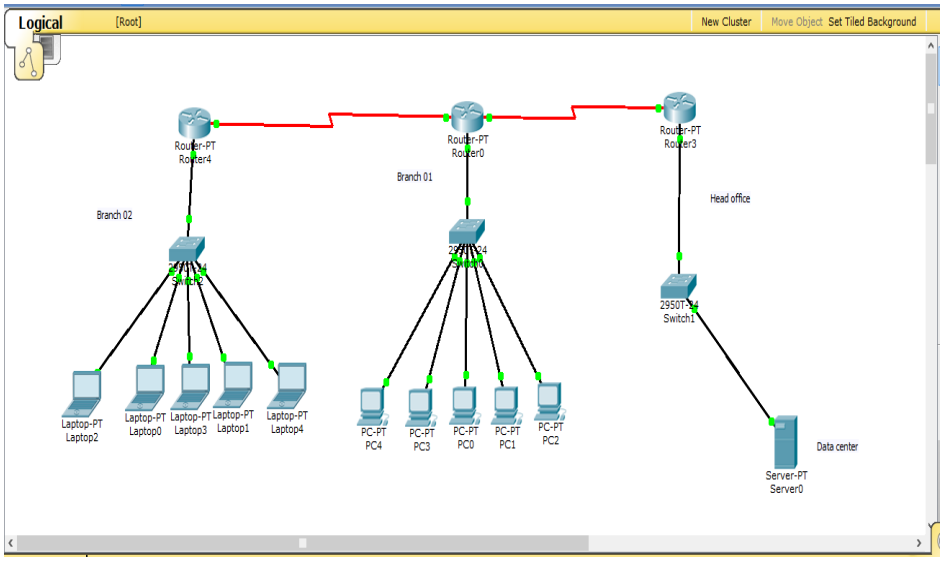


Table: Area of Functions

Area	Function and positioning	Accessible to
Open platform area: OP	Provides access to running open systems, including the accounting system as well as other accounting relevant and irrelevant service systems. This area is a major business area for communication between production and office departments.	Clients and servers
Operation and management area: OM	Has servers deployed for system operations, monitoring, and maintenance. This area is responsible for network and system management and maintenance.	Only a few authorized maintenance users
Development and testing area: DT	Accommodates servers of systems that have not been put into use, including the hosts and open platform systems that are under development or testing.	Clients and servers
MAN/WAN access area (WN/MN)	Connects the level-1 bank branch to the head office and its data center, downstream level-2 branches and outlets, as well as offices, branches, and outlets in the local city. This area provides connections to the level-1 bank branch's LANs and subordinate branches.	ATM machines, POS machines, teller terminals, maintenance users, office terminals, and terminals in business centers
Local user access area: LU	Allows access of various user terminals.	Local maintenance users, local office terminals, and terminals in local business centers
DMZ Extranet: EP	Implements interconnection with business platforms of partners, major accounts, and agents through lines of carriers.	Partners, international branches, off-bank devices (3G/2G/PSTN), telephone banking systems, and customer service centers

CHAPTER FIVE

NETWORK MANAGEMENT

5.1 Router Monitoring:

WAN links and the routers that serve them are usually the most expensive part of the network, and managing bandwidth allocation can be complex. Over-subscribing to bandwidth could mean that the company is paying for more bandwidth than required and under-subscribing could result in congestion and unacceptable network performance. WAN Monitoring and Router Monitoring thus become very critical to not just day-to-day productivity but also to a company's bottom-line. Network managers will need to optimize the quality of service by balancing throughput, committed information rate (CIR) and burst rate with congestion, response time, and discards. Some of the WAN monitoring challenges include optimizing bandwidth allocations, ensuring high network availability, quickly resolving WAN problems, capacity planning for future requirements, minimizing recurring costs on WAN links, identifying high traffic/ utilization sources and spotting & updating problematic legacy routers.

5.2.1 Switch Monitoring:

Switches are the backbone of your LAN. Any problem in your switches affects a large proportion of your LAN users. Implementing a proactive switch monitoring system helps you detect problems early and avoid potential problems. OpManager's switch monitoring functionality automatically discovers switches in your network and places them on a special switch map . All the switch ports are also discovered and intuitively placed on the map.

Using OpManager's switch monitoring capability, operators can gain visibility into the status and availability of switch ports. OpManager actively monitors switch ports and quickly notifies operators whenever a switch port or the switch goes down. Operators can setup OpManager to monitor only critical ports, an industry best practice for Switch monitoring, that prevents unnecessary alarms from being generated. OpManager also offers visibility into spanning tree status showing which ports are blocked and which ones are forwarding.

5.2.2 IP Address Management:

Extensive details to track each IP Address: For every IP address, this add-on provides DNS name, MAC address, State, System Name, Device Type, Switch Name it is connected to, Switch Port it is connected to, Alias Name, Owner & more... Besides these, administrators can also add their own custom fields against each device, both at the subnet-level and at the IP details level. Integration with Active Directory: The integration with Active Directory does a look-up for each IP address to determine if the device pertains to a computer object in Active Directory (AD). If yes, the IPAM tool fetches some more useful information from AD viz. Created Time, GUID, Last Logon, OS Name, OS Version, & more...

Historical IP Address tracking: This add-on helps you time travel and fetch past information related to a particular IP address. Admins can track down the user to whom a particular IP was allocated on a given date, using the IP history tracker.

Get notified instantly when there is a change in state for a particular IP address or the address space such as

- From transient to available or available to used IP address
- If DNS forward or reverse lookup fails, or if DNS lookup returns a different IP address value
- If IP Utilization of a subnet falls below or greater than a specified percentage

5.3 Network Fault Management:

Network Fault Management is all about staying current with what is happening in your network, be it an unforeseen outage or performance degradation. Detect, recover and limit the impact of failures in network. SBL Using PRTG to find the fault of their network in 24/7 network surveillance. If they found physically Network fault in their selected branch areas then they immediate contact with ISP to fix this problem.

CHAPTER SIX

6.1 Current Support Activities of IT Division

Information technology support activities are related to problems that are occurred in an organization. Like any other organization SBL Limited face various types of IT related problems and IT Division maneuver support activities for the whole organization.

There are four types of IT related problem arise in SBL Limited. These are:

- Hardware Problem
- Software Problem
- Network Problem
- Virus Problem

These above four types of problem can be categorizing in many ways. The problem categories and their support activities are described below.

Hardware problem:

Hardware Problem occurred by any hardware that does not work properly or failed. Below some typical hardware problems are described.

Display problem:

Sometimes they receive some personal computer from the branches which do not show the display. It can happen for the display card failure or RAM failure. These display card or RAM are not attached to the motherboard properly and can't POST or boot the machine. In these cases they attach the card or RAM properly. Sometimes the order of RAM could be change to solve the problem. Then if the display does not show they check the display card or RAM and replace these hardware to solve the problem.

Memory Problem:

Sometimes RAM does not work properly and system cannot POST. In this case RAM is checked and if it fails RAM is replaced.

HDD Problem:

Sometimes operating system cannot start for the problem in hard disk drive. Various types of problem can occur in the HDD like bad sector, file system error and HDD cannot recognized by the system. In these types of problem first of all they recovered and backup data if possible. Then they removed or repaired bad sector, change or create the file system. If the system cannot recognized the HDD they removed it from the system and replace it. If these solutions fail then HDD is replaced.

Motherboard Problem:

They received some PC from the branches with the problem in motherboard like the M/B is damaged or failed to start the PC. In these cases motherboard is replaced.

Power Supply Problem:

They received some PC from the branches with the problem in power supply like the power supply burned in high voltage or the power supply unit did not supply the actual voltage to the computer. In these cases power supply unit is replaced.

Other Hardware Problem:

There are also some problems occurred in UPS, Printer, Monitor etc like these devices are not worked properly. In these cases they send it to their respective vendor and the vendor repaired or replaced it.

Software Problem:
There are some typical types of software related problem occurred in **SBL** Limited. These are point out below:

- ¾ Problem in OS like system file missing or corrupted, file system error.
- ¾ Problem in various types of package software like the software is old and needs to update, the software needs to reinstall, some of the files missing or corrupted and needs to replace etc.
- ¾ Problem in banking software like data insertion or data posting etc.

Network Problem:

Network problem occurred due to physically damaged patch cable and modular. As a corrective measure they replaced the damaged cable and module. Another problem occurred due to the switch does not responding and the whole network of a branch is failed. As a corrective case they reset the switch and sometimes replace the switch with a new one.

Virus Problem:

Virus related problem is a major problem that they have to face in SBL. The computers are affected by viruses by using removable media like CD/DVD, Floppy, Pen drive and from the Internet. In these cases they have to use antivirus software with updated virus definition file and clean the computer.

hose above problem scenarios are occurred at end user level in SBL. There are also some problem occurred related to personal computer which is belongs to the IT Division. Sometimes the IT division could not repair the computers and in this case IT Division sends these computers to the vendors. Time and cost are two major problems when the computers send to the vendors.

6.2.1 Trouble and Troubleshoot Reports

As it is mentioned earlier SBL manage a problem log file for every quarter of a year, they logged their incoming problem into this problem log (see Appendix A). In this log every type of information like branch/ division name, problem report date, type of problem, description of the problem, suggestion and corrective action are mentioned. This trouble report also helps to find out the person who complains about this problem, who logged the problem and who is assigned to evaluate and solve this problem.

6.2.2 Report Analysis and Decision Making

The IT division of SBL reviews their problem log to create a summary report of solved problem (see Appendix B). They analyse their problem log and categorized their problem in 10 types in their summery report. This summery report also contains the data about the quantity of every type of problem in their every branch and the total number of problem occurred and solved in this quarter of the year. By reviewing this summery report of solved problem they prepare a quarterly problem management review form (see Appendix C). This form contains the data about total number of raised, resolved and pending issues and similar and unusual problems. The management of IT Division analyses the reports and makes some decision and find out the root cause analysis regarding to the every types of problem. The root cause analyses are given below.

¾Operating System - The type of problem about OS is like – the system cannot load the OS properly or the OS cannot properly, the problem related to screen saver, user login and password etc. In most of the cases abnormal shutdown of the system, virus and HDD failure causes OS corruption. Instructions have been given to update virus definitions timely. Users are also prescribed to follow proper shutdown procedures.

¾CPU - The types of problem about CPU are like – CMOS battery down and change the BOIS setup, failure of the components of CPU like RAM, HDD, Graphics Card, Power Supply, Motherboard etc. In these cases they replace the failed CPU or component with new one.

¾Monitor - The types of problem about monitor are like – failure of the monitor or graphics card. Monitor failures were mainly because of aging. In these cases they replace the failed monitors with new one.

¾UPS - The UPS does not give any backup after the power failure. UPS batteries were damaged as the UPS's were not turned off before the expected backup time. In these cases we replace batteries immediately with new batteries.

¾Printer - Mostly three kinds of problem - frequent power failure, short circuit in motherboard and power unit of the printer itself caused printer in not-working state. In most of the cases they repaired the damaged elements/units and in some cases replaced by new one.

¾Virus - Use of external devices (Pen Drive, Floppy Disk etc.) and internet made the system vulnerable by the virus and finally infected. In these cases they updated the virus definitions as well as cleaning the system using antivirus and utilities software.

¾Network - Network problem occurred due to physically damaged patch cable and modular. As a corrective measure they replaced the damaged cable and module.

¾Banking Software - In most of the cases problem occurred during user login and data posting. It is occurred because of wrong user name and password inserted by the user and because of the LAN problem.

¾Other Software - In most of the cases program files of package software corrupted and deleted and it's not useable. They reinstall the software and solved the problem.

6.3 Requirements Specification

Information Technology Division of SBLis responsible for all type of hardware and software problems and support for every branch and divisions. If any type of problem occurs, IT Division try to give them instant service, support and backup. If any component needs to be send to the vendor, IT Division send a backup system to the branch or division instantly. Time is one of the most valuable requirements for IT division to give any type of information technology support. SBL deals with the creditors' money and operates every type of transaction by the computer. So, if any type of problem occurs the branches and divisions need standby IT support. Cost requirement is another most valuable term that has to deal in any organization. The IT Division of SBL also deals with the third party vendor to purchase hardware components, software and get lot of services from the vendors. So they have to plan a budget and determine how to reduce support and service cost. IT division also pact with some requirement like hardware requirements and software requirements. For IT support it is now required to:

- ¾ Information technology related all equipment's.
- ¾ More information technology professional.
- ¾ Finally they need an IT support manual.

CHAPTER SEVEN

INFORMATION TECHNOLOGY SUPPORT

7.1.1 Hardware Problem and Support

Different computer components such as CPU, Monitor, Mouse, Keyboard, UPS and Printer do not work properly and come to IT Division. The supports related to those devices are described below.

¾CPU: For CPU, find out the specific device which does not work properly or faulty. Follow the Steps below.

Step 1: Connect the CPU with the all input and output devices and switch on the power.

Step 2: If the computer does not switched on the check the power supply unit and power cable. If computer is switched on then follow the next step.

Step 3: Observe carefully for any type of error message or sound from the system speaker.

Step 4: Check the internal devices of the CPU one after another for the problem by replacing it or connecting it again.

Step 5: The specific device problem and the solution are given afterward in the

document.

¾Power Supply Unit: If the computer does not switch on, its needs to check power supply unit and the power cable. The steps are below.

Step 1: Check the power cable that it is connected properly.

Step 2: Check the voltage selector of the power supply unit that it is selected in 230v state.

Step 3: Switch on the CPU. If the computer does not switched on then follow the next step.

Step 4: Check the CPU with another power supply unit. If it is OK then the power supply unit defined damage or burned.

Step 5: Replace the power supply unit with a new one.

¾Hard Disk Drive: If the HDD comes with the problem then these steps are followed.

Step 1: Try to recognize the HDD by attaching in a different computer. Step 2: If recognized, then try to recover and backup all data if possible by

using Easy Recovery.

Step 3: Check the type of problem in it like bad sector (follow step 4), file system error (follow step 6), unformatted (follow step 8) and partition error (follow step 10).

Step 4: Try to remove or recover bad sectors by using scan disk option in Windows or use Partition Magic.

Step 5: If not possible to repair then follow step 11.

Step 6: Create a new file system by using Partition Magic or Windows Disk Management Feature. The file must create in FAT32 or NTFS file system.

Step 7: If not possible to repair then follow step 11.

Step 8: Format the drive by using Partition Magic or Windows Disk Management Feature.

Step 9: If not possible to repair then follow step 11.

Step 10: Create new partition in the drive. Use Partition Magic or Windows Disk Management Feature.

Step 11: Replace the HDD with a new one.

¾RAM: If the RAM is not working properly, follow the steps below.

Step 1: Detach the RAM from the slot and reconnect it properly. If still it is not working, then go to next step.

Step 2: Check it by connecting in another computer. If the computer runs properly then it is OK and checks the other devices in the faulty CPU. If not then go to next step.

Step 3: Connect another RAM to the faulty CPU. If the computer does not work then check other devices. If it is working properly, the RAM is faulty.

Step 4: Replace the RAM with a new one.

¾Display Card: If the display card is not working properly, follow the steps below.

Step 1: Detach the display card from the slot and reconnect it properly. If still it is not working, then go to next step.

Step 2: Check the display card in another computer. If the computer runs properly then it is OK and go to step 4.

Step 3: Connect another display card to the faulty CPU. If it is working properly, the display card is damaged and replace it with a new one.

Step 4: Check the CPU for problem in other devices.

¾Processor: If the processor or processor cooling fan does not work properly then follow the step below.

Step 1: Detach the processor and the fan from the slot and reconnect it properly.

Step 2: Check the device in another computer. If the computer runs properly then it is OK. If not then the device is damaged and needs to be replace.

¾BIOS: If the computer shows the error message like CMOS battery low or does not initialize the BIOS settings properly then follow the steps bellow. Step 1: Change the CMOS battery with a new one.

Step 2: Update the software for the BIOS.

Step 3: If the BIOS update process failed then replace the motherboard or repair it.

¾Motherboard: If it is defined that all the add-in cards and devices are working properly but the CPU does not work then the motherboard is damaged and it needs to be replace.

¾Removable Devices: If the CPU comes with the problem with any removable device such as floppy disk drive, CD ROM drive or DVD ROM drive then follow the steps below.

Step 1: Reconnect the device and check it.

Step 2: Clean the device with the disk cleaner.

Step 3: If the step 1&2 fail then replace the device with a new one.

¾Monitor: If any monitor does not work properly or does not show any display then follow the steps below.

Step 1: Check the RGB cable (monitor data cable) and monitor power cable. If the cables are not ok replace them. Else go to the next step.

Step 2: Send the monitor to the respective vendor or supplier for repair or replacement.

¾UPS: UPS can be come with the problem that it does not give any backup or backup time is too low. Then follow the steps below.

Step 1: Check the power cable of the UPS.

Step 2: Recharge it for the specific time duration defined by the vendor or manufacturer.

Step 3: If it is not charging or give any backup, then send it to the vendor for repair or replacement.

¾Printer: Printer can be come with the problem like toner low, paper jam etc. Follow the steps below.

Step 1: Check the toner or ribbon of the printer. If it is low then replace it.

Step 2: For paper jam problem check the paper sensor and paper feeder. If it is

faulty, replace the feeder and sensor.

Step 3: Check the power supply unit of the printer. It can be faulty or damaged and replace it.

Step 4: If all the solution does not work, then send it to the vendor for repair or replacement.

¾Replacement Procedure: Any type if computer hardware needs to be replaced. The replacement procedures taken by the IT Division are as follows.

Step 1: Give the status report about the specific hardware to the manager.

Step 2: Notify the specific branch or division about the status of the hardware and the timeline.

Step 3: Send an immediate backup computer (if it is CPU problem) to the respective branch or division with full data backup.

Step 4: Notify the specific vendor or supplier and give a requisition for immediate replacement or repair.

Step 5: After replacement by the vendor this hardware send to the branch or division and return the backup one by notifying them.

7.1.2 Software Problem and Support

There are three types software mainly used in SBL Limited. These are:

Operating System, Application Software and Banking Software.

¾Operating System: Various types of problem in operating system can held and system cannot boot by that operating system. In IT Division of SBL mainly two types of operating system problem found that is: system file missing or corrupted and file system error. The corrective actions are taken by the following steps.

Step 1: Check the computer and operating system for the type of problem. Step 2: If it is system file missing or corrupted then follow the step

3. And if the problem is file system error then follow the step 6. Step 3: Check which files are missing or corrupted.

Step 4: Try to boot the computer by safe mode and scan the drives to recover or repair the specific system files if possible. If not possible then go to next step.

Step 5: Try to repair the system files by using Operating System's CD. In this case boot the machine by the CD and repair the OS by pressing 'r' in the first screen. If the process failed then go to step 7.

Step 6: Try to repair and change the file system that supported by the operating system. For that purpose use Windows Disk Management Feature or Partition Magic. If not possible go to step 7.

Step 7: Recover and backup all data if possible. Use Easy Recovery software if needed.

Step 8: Re-install the operating system from the Operating System's CD. Step 9: Install all device driver software; application software and banking

Software (depend on the use of the machine).

¾Application Software: Application software cannot work or run properly because of program files missing or corrupted. As a corrective measure the following step are taken.

Step 1: Check which software does not work properly.

Step 2: Try to repair this software by using Add/Remove Programs feature from Control Panel if possible. If not, go to next step.

Step 3: Uninstall the specific software or program from the computer. Step 4: Re-install the software.

¾Banking Software: In SBL banking software occur the problem like user cannot login and problem in data posting. This problem occurred because of wrong user name and password, change of user profile and for the LAN problem. LAN problems are described in the document subsequently.

Step 4: Create a new password and user name for the specific user. Step 2: Delete the existing profile and create a new one for the user.

7.1.3 Network Problem and Support

Various types of network problem arrive to the IT Division of SBL Limited. These network problems are basically LAN problem. The Problem is like switch problem; network patch, modular, connector problem; and network interface card problem.

¾Switch: Switch can hang or cannot work properly. For this reason, the whole network of the specific branch can be down. The supports are below.

Step 1: Reset the switch.

Step 2: if not work, replace it with new one.

¾Network Patch, Modular and Connector: Network patch, modular and connector can be broke and computer does not work in a network. In this case check the specific devices and find which is faulty. Then replace it with a new one.

¾Network Interface Card: Network interface Card (NIC) can be damaged and the computer cannot work within the network. In this case supports are below.

Step 1: Detach the NIC from the slot and reconnect it properly. If still it is not working, then go to next step.

Step 2: Check it by connecting in another computer. If the computer work within the network then it OK. If not then go to next step.

Step 3: Connect another NIC to the computer and set the machine IP. If the computer does not work in the network then check other devices. If it is working properly, the NIC is faulty.

Step 4: Replace the NIC with a new one.

Step 5: Set IP for this machine. The IP address can be as follows:

Virus Problem and Support

Virus is one the major risk for any computer in the world. Always new viruses are created and harm the computer. This virus can be spread out by the network, removable device and internet. The branches and division are complained about virus problem in their computer to IT division of SBL. It is found that for virus computer runs very slow; file cannot copy; system/ program files missing or corrupted; network disabled. As a corrective measure the following step are taken.

Step 1: Install or update antivirus software (if needed).

Step 2: Update virus definition files.

Step 3: Scan full system for viruses.

Step 4: Clean or delete virus affected files.

Step 5: Repair missing or corrupted system files (if needed).

Step 6: Create a new network settings (if needed).

CHAPTER EIGHT

CONCLUSION

8.1 Limitations

In conducting the present study, following limitations had been confronted:

¾The results of this study restrict generalization, and may not fit to other Bank as the study was conducted only in the context of SBL.

¾The study is concentrated in selected areas.

¾Time limitation is one of the major things to determine IT support manual for this big organization and three months is not enough for this type of research.

¾There were some confidential files where I did not get access.

¾Only current information technology policy and situation is considered.

8.2 Future Scope of Work

Within the limited duration of three months internship program, it is very go through in-depth works related to the IT support manual. During the project work, there was an opportunity to work with the professional and skilled personnel of SBL. It was really a pleasant and thrilling experience. The project work was on the "NETWORK PLANNING AND MANAGEMENT OF SBL Technology Division of SBL". It can be said that this manual is not a complete reference or manual or guideline for IT Division of SBL. Considering the limitations, anyone can improve this manual and there is lot of future scope of work in IT Division of SBL.

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APPENDIX B

SBL Limited

IT Division,Head Office, Dhaka

Summary Report of Solved Problems for the Month

	Category of Problem										
BranchCode	OS	CPU	Monitor	UPS	Printer	Virus	LAN	Banking S/W	Other S/W	Other	BranchTotal
001	7	10	2	8	14	13	16	8	14	10	102
002	2	6	2	5	5	3	4	3	6	5	41
003		1		1							2
004		1									1
005				2		1	1	2			6
006		4	1		3		1	1	2	1	13
007		1									1
008		4				1		3			8
009	1	4			3	2	5	2	1	1	19
010		1		5				3	1	3	13
011		1			2			1			4
012		1						1			2
013		3	2	1			1	1			8
014		3	1	1				1	1		7
015	1	2			1	1	4	4	1		14
016		1			3			3			7
017		2			1			1			4
018		1		1			1	1			4
019		1						1	1		3
020		1						2			3
021	2	4	1		3			2		1	13
022	1	1		1	1	1		1	2		8
023		2	1	1		1		5	1		11
024		1						1			2
025		4			1			1			6
026		1			1		2	1			5
027		1						1			2
028		1	1					2			4
029		1					2	1	1		5
030		1						1			2
031		1					1	4	4	1	11
Total	**14**	**66**	**11**	**26**	**38**	**23**	**38**	**58**	**35**	**22**	**331**

SBL Limited

IT Division, Head Office,Motijheel C/A,Dhaka-1000

Quarterly Problem Management Review Form

Category of Problem	Total Issue Raised	Total Resolved Issues	Total Issues Pending	Similar Case	Unusual Case	Preventive/Corrective Action Taken
OS	14	14	---			In most of the cases abnormal shutdown of the system, virus and HDD failure causes OS corruption. Instructions have been given to update virus definitions timely. Users are also prescribed to follow proper shutdown procedures.
CPU	66	66	---			CPU failures were mainly because of aging. In these cases we replace the failed CPU with new one.
Monitor	11	11	---			Monitor failures were mainly because of aging. In these cases we replace the failed monitors with new one.
UPS	26	26	---			UPS batteries were damaged as the UPS's were not turned off before the expected backup time. In these cases we replace batteries immediately with new batteries.
Printer	38	38	---			Mostly three kinds of problem - frequent power failure, short circuit in motherboard and power unit of the printer itself caused printer in not-working state. In most of the cases we repaired the damaged elements/units and in some cases replaced by new one.
Virus	23	23	---			Use of external devices (Pen Drive, Floppy Disk etc.) made the system vulnerable to the virus and finally infected. In these cases we updated the virus definitions as well as cleaning the system using antivirus and utilities software.
LAN	38	38	---			LAN problem occurred due to physically damaged patch cable and modular. As a corrective measure we replaced the damaged cable and modular.
Banking S/W	58	58	---			In most of the cases problem occurred during user login and data posting. It is occurred because of wrong user name and password inserted by the user and because of the LAN problem.
Other S/W	35	35	---			In most of the cases program files of package software corrupted and deleted and it's not useable. We reinstall the software and solved the problem.
Others	22	22	---			