

National Credit and Commerce Bank Limited
Internship in IT Audit

by

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A thesis submitted to the Department of Computer Science and Engineering
in partial fulfillment of the requirements for the degree of
B.Sc. in Computer Science

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Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. We have acknowledged all main sources of help.

Student's Full Name & Signature:

A handwritten signature in black ink, appearing to be 'RFL', written over a horizontal line.

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Approval

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Abstract

Human capacity in the auditing field is immense. The task not only ensures company security but also the safety of its employees and clients making it one of the most crucial sectors. To identify the lack of security and policy maintenance failures, auditing is necessary. Regular audits ensure the maintenance of software, hardware, office conditions and safety protocols which are essential to running the company smoothly.

During my 6-month internship at NCC Bank, I was tasked with observing and conducting audits in various branch locations. The experience was enlightening and truly a valuable learning experience. Not only was I placed in an environment dealing with real world tasks and concerns, but the work environment itself was supportive in preparing me for what to expect in this field. With the opportunity to shadow meetings and my colleagues, and accompany them to various auditions inside and outside Dhaka, I witnessed lacking in the bank's oath to uphold company policies which ensure data security and employee safety. It was crucial to identify these issues and report them accordingly step by step so that they could be rectified. Additionally, I had the opportunity to provide my insights and recommendations which were appreciated with ample constructive feedback.

Undeniably, there are some aspects in the auditing sector which cannot be digitized. For instance, visiting locations, seeing the condition of the offices, talking to employees and making detailed notes. While a hands-on auditing experience was crucial to my understanding of the real world and what this sector holds, an effective storage method is needed for reports. This inspired my app Report Manager which would house reporting activities and keep track to information being sent and received eliminating the need for any middlemen or manual labour. With further development, this app is targeted to better the workflow and reduce the stress that the teams might face during their reporting process.

Dedication

To my wonderful parents and grandparents, without whom I would not be here, I would want to dedicate all my efforts and hardships in my academic life. Additionally, I would like to thank my reputable supervisor Talat Morsalin sir for teaching and encouraging me while I built my character and work ethic to become an effective professional and my academic supervisor Golam Rabiul Alam for always being available to assist me when in need.

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I would like to begin by thanking Allah (SWT) for helping me come this far and for guiding me in finishing an important part of my life. I would also like to thank my supervisors, Golam Rabiul Alam sir and Talat Morsalin sir, who went above and beyond to assist and guide me in successfully completing both my reports and my internship. From before my internship till the absolute end, I sent Golam sir a massive amount of emails, to all of which he promptly answered and offered me great advice. Talat sir, along with my coworkers Rakib sir and Rajib sir, have guided me through the internship at every step of the way. Another great help during my internship is a colleague and close friend Farhan S. Ghazi who had helped when I faced difficulty in anything while at the same time encouraging me to learn and grow myself. Any questions were answered no matter how simple they were, just for better understanding and knowledge.

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Chapter 1

Introduction

1.1 About the Internship

An internship gives students and fresh graduates the chance to apply their cumulative knowledge and gain experience in a professional, practical and real time environment. It gives students the opportunity to build themselves, explore and develop their careers, work with industry professionals, make connections, and gain exposure to work experiences and new skills related to their field of study. All this helps in making the transition from an academic life into the practical world. The employing companies also gain greatly from internships. They will have a better understanding of their new interns and will be able to assign the interns to the position that best suits their needs and appropriate for interns skills. It also allows the company to introduce new ideas and enthusiasm into the workplace, cultivate talent and create a pipeline for future full-time employees. Considering all this, an internship also adds to a student's work experience, which increases the value of the intern's CV, resulting in better career chances in the future.

BRAC University has a mandatory course where students get the choice between writing a thesis paper or applying themselves in a specialized area with an internship of their choosing, granted it must be relevant to their field of study. Whichever one the student opts for, BRAC University offers more than adequate support to the student. If one chooses to do an internship, they encourage the student to gather as much experience and information from the work environment as possible, as well as encourage students to do meaningful work to benefit themselves and the workplace. As a prerequisite for the internship, the student must first complete over 72 course credits. Once they do so, they must partake in an internship with the duration of 6 months at a reputable company.

As a BRAC University student, I opted to do an internship under NCC Bank Ltd. NCC Bank started out as an investment company which eventually became a full-fledged private commercial bank in 1993. Over time, they have built a solid reputation in offering excellent, personalized banking and financial services to its consumers in a technologically advanced environment. I went into the internship with hopes of gaining as much experience and knowledge as I possibly could, with the added expectation that it will come of great use in my future academic pursuits and practical work. I strongly believe that this opportunity would open numerous career paths for me along with providing a platform for me to network with professionals in my field.

1.2 Objective

The objective of this report is to provide the readers detailed information addressing the knowledge I have gained, my work experience and the challenges I faced.

1.3 Specific Goals

The specific goals for this report are to

- Describe the work environment.
- Portray the company profile in depth.
- Provide details of all of the services NCC Bank Ltd delivers to its clients.
- Describe the various services provided by NCC Bank Ltd.
- Demonstrate what I have learned throughout my internship.
- Document all of the work I completed on the assignment. To document all of the work I completed on the tasks I was assigned with.
- Describe my solo project and its preliminary development.

1.4 Methodology

As the majority of this report is about all that I have learnt, most of the data gathered is primarily from my own personal experiences, advice given by my supervisors and coworkers, audit meetings and observations in the workplace. Secondary sources of information include the internet resources and NCC Bank's main website.

Chapter 2

Company Profile

2.1 Overview

NCC Bank Ltd. or National Credit and Commerce Bank Limited is renowned in Bangladesh with 124 branches across the country. Since its inception over 27 years ago, the bank is reputed for its outstanding financial service based on solid client relationships and incorporating the latest technology. They effectively create a unified and welcoming atmosphere where their customers and employees can excel. They also provide services including retail banking, Non-Residential banking (NRB), bank securities or financial services, treasury and remittance services, off-shore banking services and card services.

2.2 Vision and Mission

NCC Bank's mission is to deliver top-notch financial services to communities based on strong customer relationships. They aim to provide long lasting solutions combining cutting edge technologies, a good banking experience and financial strength to their clients and stakeholders. The bank further aspires to serve the nation as a progressive and socially responsible organization by combining credit and commerce for increased shareholder value and long-term prosperity. [1]

2.3 SWOT Analysis

SWOT analysis **sarsby2016swot** is a methodical planning process that assesses a project's advantages, disadvantages, potential advantages, and threats. When applied in a business setting, a SWOT analysis assists a company to carve out a sustainable niche for itself within the industry. It can be applied to all types of decision-making and promote proactive thinking as opposed to relying on reflexive or automatic reactions. The following SWOT analysis of Orion illustrates the company's advantages, disadvantages, opportunities, and threats. [8]


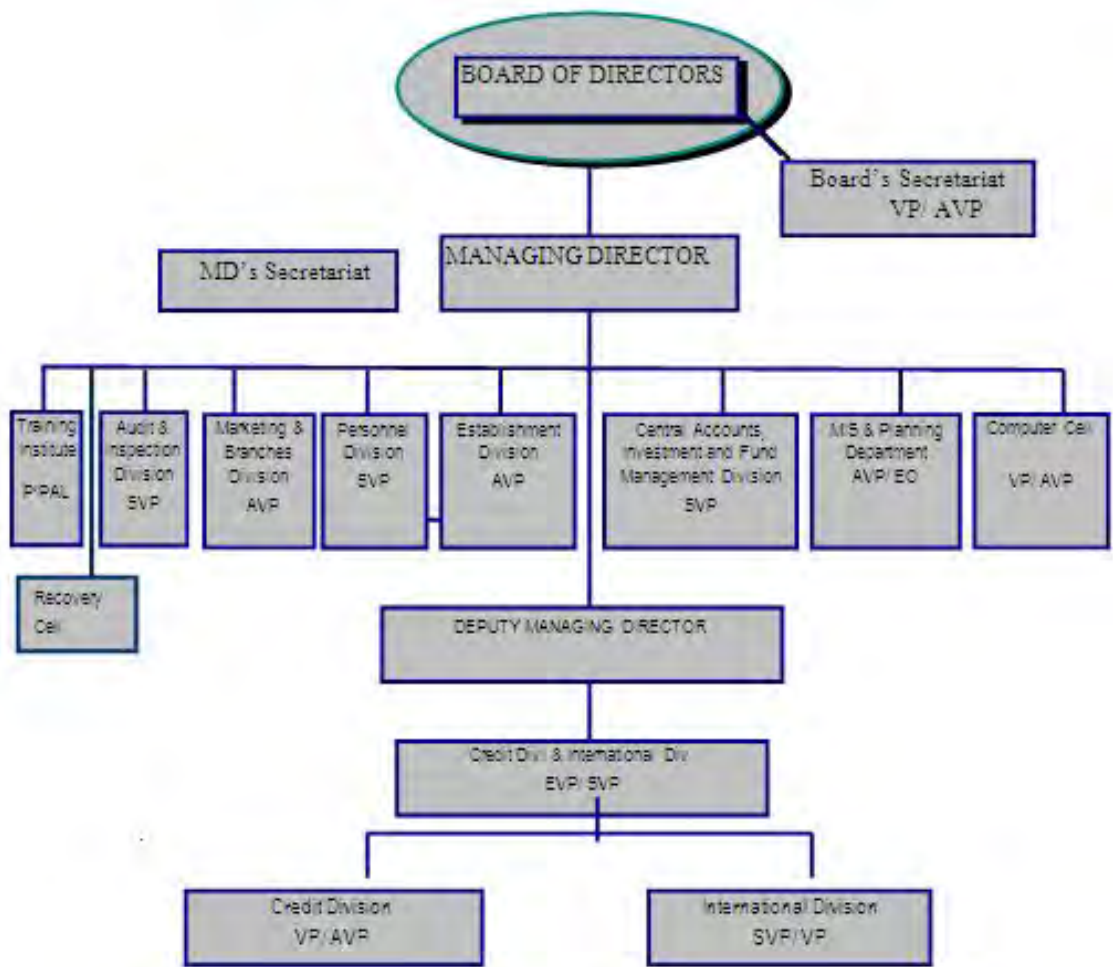
<p>SWOT Analysis</p> 	<p>Strengths:</p> <ul style="list-style-type: none"> i) High service levels ii) IT/software expertise iii) Effective sales and service culture iv) Solid financial reserves v) Highly convenient locations 	<p>Weaknesses:</p> <ul style="list-style-type: none"> i) Mixed quality staff ii) Limited online advertising experience iii) Limited social media success iv) Targeting price elastic markets v) Broad competitive set
	<p>Opportunities:</p> <ul style="list-style-type: none"> i) Attract new customers through special offers ii) Target more price inelastic markets ii) Advertise on online comparison websites iv) Creating more engaging social media content v) Strengthen our value proposition 	<p>Threats:</p> <ul style="list-style-type: none"> i) Rising fixed costs ii) Online fraud iii) Growing competitive set iv) Breach of data v) High levels of inflation

Table 2.1: SWOT Analysis

2.4 Infrastructure

NCC Bank would not be as successful as it is now without a good infrastructure with resourceful employees. There are many departments critical in the bank's effective running and its operations. The following will give a brief overview of what they are and their work.

ORGANOGRAM OF NCCBL



2.4.1 Board of Directors

The board of directors decide most of the bank's ongoing issues and handle policy implementations. They set the bank's goals, objectives and policy implementation strategies. They appoint executive officers and managers to run day-to-day operations of the bank and its branches. Additionally, they try to limit risks when any decision is being made and allocate funds accordingly to avoid bad investments. Furthermore, they oversee that the bank complies with relevant statutes (both internal and external), through regular and periodic audits.

2.4.2 Shareholders and Partners

Information on shareholders is confidential but their main jobs are to invest into the bank, obtain more shares and appoint board members.

2.4.3 IT and IS Department

The IT and IS department cater to the technical side of bank activities. This includes purchasing hardware, software like flora, floraweb, ABS, supplying it to all departments and branches and addressing technical issues faced by employees. They additionally track the assets they supply ensuring minimal inconsistencies in reports. Furthermore, they are up to date with the latest technology for smooth bank operations. Most importantly, managing the bank's confidential information falls under their domain. Thus, they are hard pressed to keep security tight and cover all loopholes to avoid breaches.

2.4.4 ICC Division

The Internal Control and Compliance Division (ICCD) is responsible for ensuring that the entirety of the bank follows the set policies and makes sure to avoid irregularities. They report directly to the board of directors regarding any discrepancy. This department is responsible for auditing all branches and departments regularly. These audits include general audits, financial audits and IT/IS audits, the last of which I was a part of.

2.5 Services of the Bank

NCC Bank offers many services to their customers starting from retail banking, loans, remittance, NRB banking to providing credit/debit cards and other cash services. [1] The following is a brief overview of some of the services provided.

2.5.1 Retail Banking: Loans and Deposits

NCC Bank gives loans and deposits to customers for a wide range of reasons like entrepreneurship, education, home investments, bill payments and family support etc. Customers have the benefit of opening a variety of deposit accounts like a current deposit account, for savings, special notice, special savings, special deposit and money double accounts.

2.5.2 Non-Residential Banking

NRB banking also avails their services to Bengali citizens who reside abroad striving to provide them with modern services to better manage finances.

2.5.3 Treasury Services

For efficient dealing, NCC Bank Treasury has a state-of-the-art dealing room with a specialized staff. It offers a wide range of Treasury services, including Foreign Exchange and Money Market and Fixed Income. NCC Bank Treasury further engages in need-based foreign currency transactions in the interbank market, providing attractive exchange rates for major currencies versus BDT to importers, exporters and non-resident remitters.

2.6 Recruitment

In my internship application, I was sent a forwarding letter from BRAC to NCC Bank HR Department along with my resume. Then the bank returned an offer letter and asked to come in for an interview where I was questioned by HR representatives and the Head of the ICC Department, which I was later chosen to work for. They inquired about my abilities, proficiencies, interests and plans after graduation. It was quite a nerve-wrecking interview but the friendly attitude and welcoming tone of the interviewers allowed me to be more comfortable and answer their questions in a poised manner. Satisfied with my answers, they offered the position of IT/IS Auditor intern which I gratefully accepted.

2.7 Projects

NCC Bank has been working on a project named ‘Core Banking System/Solutions’ or CBS, a software program allowing customers to monitor their accounts and utilize numerous banking services, handle daily banking transactions and maintain accounts and other financial information [4]. One does not need to go to their local branch physically to do banking activities. They may do so at any time and from any location. They can use any CBS-affiliated bank branch to get banking services, regardless of where they originally opened their account.

Chapter 3

IT Auditing?

3.1 Overview

IT AUDIT is the process of gathering and assessing information to evaluate if a computer system is built to protect data integrity, secure assets, enable successful achievement of organizational goals, and make optimal use of resources. In IS, auditors must understand the characteristics of information system users as well as the decision-making environment in the auditee organization.

The use of computers has motivated innovative ways of processing, recording, and managing information, as well as the merging of numerous formerly separate functions. Therefore, the risk of material systems failure has grown dramatically, resulting in significant financial costs for the company. As many computer programs are highly repetitious, even minor failures can cause damage. For example, in a manual system, an error in calculating the amount of income tax that employees must pay would not affect every instance. However, once an error is introduced in a computerized system, IS will affect every case. This makes IS critical for the auditor to verify the unseen processes and detect the vulnerabilities in a computer information system, as the costs associated with errors and irregularities might be significant.

The increased use of computers for processing organizational data has expanded the scope of internal control review and assessment for AUDIT purposes. Internal controls are extremely vital in any computerized system, and it is crucial for an auditor to ensure not only that adequate controls exist, but that they also perform effectively. Internal controls should also be proportional to the risk being assessed to keep the effect of identified risks to acceptable levels. IS Internal controls in computer systems must be evaluated by auditors to reduce the risk of mistakes, fraud, and other damaging activities, as well as occurrences that cause the system to be unavailable.

3.2 Need for Audit

Management using information systems has goals and expectations for what they want to achieve from their significant investment in technology. Achieve business value through reduced costs, higher effectiveness, improved efficiency, and/or increased service delivery are some reasons for introducing ICT inside the organization. An IS Auditor is required to give management assurance in relation to these

goals. [3] Management's goals and objectives in using technology to assist business operations are as follows:

- **Confidentiality:** Safeguarding sensitive information from unauthorized disclosure is referred to as confidentiality. The level of data sensitivity must be considered, as this will decide how strict the controls over its access should be. Management must have confidence in the organization's ability to keep information confidential, as a breach of confidentiality could result in major public relations damage.
- **Integrity:** Integrity refers to the correctness and completeness of information, as well as its validity in terms of company values and expectations. Because IS assures both management and external report users that the information produced by the organization's information systems can be relied on to make business decisions, it is a crucial AUDIT objective to get confidence on.
- **Availability:** Availability refers to the information accessible when it is needed by the business process, now and in the future. The security of required resources and associated capabilities is also a concern for IS. Given the high-risk nature of storing sensitive data on computer systems, banks must ensure that the information they want for decision-making is readily available.
- **Reliability:** Reliability is when the degree of the system's capacity to execute its needed function under specified conditions. In order to offer assurance that the system continuously works and executes its stated duties as expected, reliability is a crucial AUDIT objective.
- **Compliance with legal and regulatory requirements:** Compliance refers to adhering to the rules, regulations, and contractual responsibilities that apply to the business process, i.e., externally imposed business requirements. Management and key stakeholders need confidence that appropriate compliance processes have been implemented, as failing to do so might result in the organization being fined.

Underlying these goals and objectives is the requirement to guarantee that information technology, as well as the controls that support it, aids the organization in achieving its business objectives through efficient resource allocation.

3.3 IS Audit Objectives

The goal of an IS AUDIT is determining whether an auditee's computerised information system (CIS) produces timely, accurate, complete, and reliable information, as well as ensuring data confidentiality, integrity, availability, and reliability, as well as adherence to relevant legal and regulatory requirements. The category of audit will determine the audit's aims. [3] The goals of conducting an IS AUDIT as part of a financial statement AUDIT are to:

- Determine how successfully management capitalizes on the use of information technology

- Recognize the widespread impact of information technology on business operations, such as the preparing financial statements
- Recognize how the client's use of information technology for financial data processing, storage, and transmission affects internal control systems and assessment of inherent and control risk
- Recognize the management controls used to measure, manage, and control information technology processes
- Reach a conclusion on the effectiveness of controls over information technology procedures that have a direct impact on financial data processing.

The objectives of the AUDIT are further defined by the function IS plays in the audit when IS AUDIT is included in the performance audit.

If the performance AUDIT is focused on information systems, the goal will be to ensure that all parts of the IS systems, including appropriate controls, are being enforced successfully.

The purpose of auditing could also be assessing the efficiency and efficacy of a business process/financial program. The IS AUDIT's primary goal is to ensure that the IS systems can be trusted to assist in the delivery of needed services. After assessing the influence of IS on the organization's ability to supply certain services, the efficiency and efficacy of those services are reviewed from a non-IS perspective.

Chapter 4

Training Phase

4.1 Overview

Working as an intern at a bank is a significant step forward in both one's academic and professional life. Being able to gain work experience nowadays, when the job market is so competitive, is a huge bonus.

I joined NCC Bank as an intern in the ICC Division as an IT Auditor. Although this internship is required by BRAC University, I took it as an opportunity to gain work experience and expand my network. I was very inexperienced, but with the help of my supervisor and colleagues I was able to learn the work flow efficiently. Within 2 weeks of my internship, I was paired with a colleague and sent to several audits. My initial goal was 10 audits during my internship duration. However, I was able to do 15 in less than half that time.

4.2 Learning the Guidelines and Policies

Bangladesh Bank has set a list of guidelines and policies for banks and non-bank financial institutions to follow. [2] These include details from what to do for major policy changes to minute details like putting up a sign to not eat or drink in the network room. My goal for the first couple weeks was to understand these policies and learn the consequences for not following them. Additionally, I sat in audit meetings that were happening at the time to get a proper understanding as to how my team members proceed.

4.3 Learning the Audit Cycle

After a couple weeks of shadowing my colleagues, I was handed my first task of auditing a branch with a supervisor. My colleague taught me hands-on how to do each aspect of the audit. He then let me do it on my own, helping when necessary and pointing out my mistakes. Soon after, I was able to do the full audit with minimal mistakes. The audit cycle consists of several steps, most taking place in the branch. They are as follows:

- Firstly, the notice for auditing to the branch manager is given. This includes the members of the audit team and the audit duration. Then, the LAN Man-

ager of the branch is assigned to procure the documents and files required by the audit for further questioning.

- Secondly, I prepare appendices with respect to the branch employees; the IP address assigned to the branch and print out the IT asset inventory given by the IT department to find any discrepancies with the assets present in the branch.
- Thirdly, data collection. Here, I check various security elements of the employees PCs and workstations, their access permissions in the applications they use, and their training.
- Fourthly, I proceed to question the LAN manager about the registers and documents, whether they are updated and follow the bank's guidelines.
- The fifth step is checking the condition of the Network room ensuring no possibility of risks that could jeopardize the bank's security.
- These issues are filled out in appendices, recorded into the audit file and reported to the branch manager.
- Lastly, I compile our work, summarize the report, make recommendations for the issues found so that the branch can fix them and so that the issues do not repeat. This completed report is then sent to the branch manager and the head of the ICC department to keep record of discrepancies observed by the audit team.

4.4 Advice and Assistance

During my first 2 weeks, my colleagues were always willing to give advice when I faced trouble. During my trial audits, my partner helped me correct my mistakes. My supervisor constantly kept me working by making me read previous audit reports. I was willing to learn and they were eager to help and give substantial feedback.

4.5 Meetings and Shadowing

During the first couple weeks, I went to an Audit in the head office IT Division. I sat there taking notes of the auditing procedure, occasionally asking questions and providing inputs. The IT representative was cooperative and treated me as a full-fledged, professional auditor. I joined the audit process helping to find a major issue (mentioned later in chapter 4) and helped with the final report. All in all, shadowing these meetings gave me the opportunity to observe and engage without feeling like a fish out of water.

4.6 Work Environment

Initially, I was very nervous. This was my first time working in a corporate workspace and expectations for myself were high. However, everyone welcomed me as a part

of the team. They were helpful, good natured and quite humorous. I made many connections and the occasional joking kept the environment light and alive. Despite their humorous nature, when it came to work, they were very professional. They treated me respectfully and kindly rather than just another intern. The ICC Division of NCC Bank has proved itself a great place to learn as well as have interesting and unique experiences, along with memories to look back on.

Chapter 5

My Work in Branches

5.1 How I Started

After learning the audit cycle, the ICC Division sent me and a colleague to audit multiple branches inside and outside Dhaka. As I continued my work in these branches, I have found innumerable issues in the branches, some more serious than others. Suffice to say, my performance exceeded their expectations over the course of my internship.

5.2 Details of the Appendixes

For data collection there are 5 appendixes to fill out. The first is to find out what training the employees had received, which is crucial as there is a steady flow of new employees every year as well as the fact that employees are shuffled between branches after a set period of time. The second is to list the security irregularities. This was crucial as if any irregularities were found it could result in a security breach that could lead to severe consequences and threats. The third is an appendix to compare the physical assets present in the branch versus the IT Inventory List given by the head office to find any discrepancies between them. In the fourth appendix, I listed the amount of excess access permissions each employee has to the banking software so that nobody can take advantage of them to disrupt commerce. The fifth and last is a list with details of obsolete or unused assets so that the branch is informed which exact asset to either dispose of or fix.

5.2.1 Appendix A

The following appendix extends to show however many employees are in the branch. Each employee has an ID given to them by the bank and one that must be used to enter their domain in their computer or access their respective accounts in applications or sites. Foundation Training is the training most employees must receive as soon as they are employed by the bank and consists of general banking knowledge as to bring them up to date of the methods used in the bank. LAN Manager training is specifically only for LAN managers for them to maintain the efficiency of their network used in the branch. The LAN manager is also required to keep track of the registers, CCTV recordings and a general knowledge of the number of obsolete

assets in the branch. Flora Web training is a training given to all employees targeted for the use of the Core Banking Software Flora web. Initially, Flora was used before the recent implementation of a Core Banking System. Thus most employees, at least to my knowledge, do not have this training.

Sln	Employee ID	Employee Name	Designation	Flora Web Training	LAN Managers Training	Foundation Training
1	694	Mr. John Smith	Officer	Yes	–	Yes
2	413	Mr. Dave Strider	Executive Officer	No	Yes	Yes
3	293	Mrs. Pam Beasley	Principal Officer	No	–	No
4	4592	Ms. Rose Lalonde	Junior Officer	Yes	No	No

Table 5.1: Training Position of the Branch

5.2.2 Appendix B

Sln	IP Address	User ID /Emp ID	USB Port/ Pen Drive Enabled? (Yes/No)	Antivirus Status	Unauthorized Software? (Yes/No), If Yes, list	Windows 7 Enabled? (Yes/No)	PC under Active Directory (AD)? (Yes/No)	Windows Security Updated? (Yes/No)	User Found using Own Domain User ID & PWD? (Yes/No)	External Internet Connection (Yes/No)	Updated Web browser (Yes/No)	PC used in Which Purpose/Desk
01	192.168.113.	694	No	Active	No	No	Yes	No	Yes	No	Yes	SWIFT
02	192.168.113.	Common	No	Active	VNC	No	Yes	Yes	Yes	No	No	Scanning
03	192.168.113.	4592	No	Update failed	WPS Office, Photo-shop	No	Yes	Yes	Yes	No	Yes	Cash

Table 5.2: Various Information related to IS Audit in a Branch

This table represents the securities of the computer. Each computer has an IP address assigned to it for network ID purposes and the user ID represents which employee is using the computer. It is generally not allowed for 2 or more employees to use the same computer or the same ID (domain), in case they do something wrong, and the employee with the ID takes the blame, leading to inaccurate reports. Pen Drives are also not allowed in case an employee accidentally brings in a virus or takes home confidential data on purpose or by accident. The antivirus status represents whether it is active or not or if there is something wrong with it, in which case, is a threat to the bank as it will not be able to detect any viruses in the computer

which could lead to loss or corruption of data. No computer is allowed to have any application unauthorized by the head office. For example, VNC is a virtual remote access program which could be misused at will with limited ways to track back to the perpetrator. Since Windows 7 is obsolete, it is regarded as ineffective and insecure. So to update it would be an important priority for the IT division. Any PC not under active directory would mean it is beyond the bank's network. No employee would be able to access their domains through these PCs. To ensure these have no access to the network, I must try to ping other PCs that are in the network using command prompts. An updated Windows security is a must have for all PCs and workstations as it leaves little chance for malwares and such. As I've mentioned before, 2 or more employees must not use the same domain for work, so keeping a record of whether they are following the policy is crucial. Having any access to external internet or WiFi is the most threatening to the bank. It leads to easy access for malwares, phishing, hackers and more threats. NCC bank has had an incident losing large amounts of money due to phishing around 2012 due to a PC having an external internet connection. Since Flora web requires a closed network connection, keeping browsers updated is essential to avoid inefficiency while working. And lastly, I must make a record of what each PC is used for, whether for Cash purposes, General Banking, Advance, Remittance, Foreign Trade, scanning/printing, SWIFT, etc.

5.2.3 Appendix C

The following appendix is made to list down the number of assets in the IT Inventory list given by the head office to the branch, detailing serial numbers, procurement dates and so on. Each asset must have proper labeling according to bank policy. I cross reference the Serial numbers to check whether they are in the inventory list. If they are not, the brand as well as the serial number is recorded as it is an extra asset or mistakenly given to the branch without record. I am also required to list down the number of obsolete assets in the branch and keep note of them along with informing the appropriate manager or employee so that they can decide on whether to dispose, send back or fix the asset.

Sln	Item Type	H.O Recommended	Physically Verified	Difference
1	CPU	41	33	-08
2	Laptop	02	00	-02
3	Printer	16	09	-06
4	Scanner	05	05	00
5	UPS	14	05	-09
6	Router	03	01	-02
7	Switch	03	02	-01
8	Firewall	01	01	00

Table 5.3: Total ICT Assets

Sln	Item Type	Physically Verified
1	CPU	04
2	Laptop	-
3	Printer	03
4	Scanner	02
5	UPS	01
6	Router	-
7	Switch	-
8	Firewall	-

Table 5.4: Total Obsolete/Unused ICT Assets

5.2.4 Appendix D

The following list simply details which assets are obsolete including the type of asset, brand and serial number so those from the IT division can correctly identify which asset to fix or dispose of, and to keep a record of said obsolete assets observed at the period of audit.

The below is a list of employees and the excess access permissions they have in Flora Web. This is decided on their job description in the branch. For example, if one is working in Cash, permissions of remittance, credit, general banking is removed. There are exceptions of course, in the case that each employee must have a back up partner to do his job when he/she is unable to. There is also a case of limited manpower, where I must hold exception though within reason.

Sln	Name of the User	Designation	User ID	Permission need to be de-activated
01	Mr. John Smith	Officer	694	All Entry/Authorize Power of Deposit Module All Cheque Book related Permission
02	Mr. Dave Strider	Executive Officer	413	Deposit Account Authorization & All Cheque Book related Permission
03	Mrs. Pam Beasley	Principal Officer	293	i) Deposit Account Authorization ii) Clearing Authorization iii) Signature/Picture Card Add iv) Signature/Picture Card Update/Remove v) Signature/Picture Card Management & All Cheque Book Related Permission

Table 5.5: Access Permission List in Flora Web

5.2.5 Appendix E

Sln	Item Name	Brand	Serial Number
1	SCANNER	KODAK	54056279
2	PC	DELL	YJJ432S
3	PRINTER	HP	PNC1535FHT

Table 5.6: Obsolete/Unused IT Asset List

This list simply details which assets are obsolete including the type of asset, brand and serial number so those from the IT division can correctly identify which asset to fix or dispose of, and to keep a record of said obsolete assets observed at the period of audit.

5.2.6 Registers, Documents and Audit Details

- BB ICT Guideline-2015 (3.0v).
- NCCBL IT Policy-2018 (2.1v).
- Latest Branch Organogram with ICT responsible Personnel. (photocopy)
- Office Order for LAN Managers. (photocopy)
- Latest Job Description for all Officers. (photocopy)
- Network Diagram. (photocopy)
- IT Circular File.
- IT Asset Register.
- IT Problem/Incident Register.
- Network Room Access Control Register.
- Network Room Visitor Log Register.
- CCTV Register.
- Debit Card and PIN Delivery Register.
- Meeting Minutes on IT related Awareness Program (photocopy).
- Access Request Form File
- Affairs-level-4
- Audit Trail Report (last 5 days)

The LAN manager must provide all these documents in the period of the audit. Failure to do so is considered as an irregularity as per the bank policy. Another important policy is to keep each of them updated. The LAN manager must update the registers weekly or periodically if not daily. There are additional aspects to take notice of during the period of audit: The Branch Organogram (2) must include IT personnel in accordance to a more recent policy. Each employee's job description or JD must include a fallback person to do his/her work in the case that they are unable to. Each employee must be made aware of the latest IT circular with periodic meetings to discuss said circulars with signatures of employees on the IT circular file as proof. It is crucial to keep an updated record of the problem register to keep note of each and every problem employees face and the resolutions to those problems so that in the event it occurs again, they are easily resolved. There must be a Network/LAN diagram in accordance with the policy shown by Bangladesh Bank which clearly shows which PC is connected to which router and so on. The Network room must be clean and neat at all times with proper air conditioning to avoid fire or electric hazards as the routers and servers must stay cool to operate. There should most be a fire extinguisher (with proper expiration date labeled) close by in case of emergencies as well as a list of emergency contacts (managers, LAN manager, police, fire department, ambulance etc.). Keep a "No Eating/Drinking" sign on the Network room door so as to avoid uncleanliness inside the room. The CCTV DVR must be kept in a secure place like a box or safe. CCTV registers must stay updated weekly and the backup of the CCTV must contain footage of the previous year. It is often seen that the CCTV recording footage is not aligned to real time, which is most definitely counted as an irregularity and must be fixed immediately. Debit/Credit cards and their PINs must be provided from separate employees as it is an insecurity to provide both from the same person. Finally, a meeting must be held on the last day of the audit with the branch manager to inform him of all observed irregularities found in the branch detailing why it is harmful when these problems persist as well as providing recommendations to fix said problems in accordance to policies set by the bank.

5.2.7 Final IS Audit Report

In the head office I must compile the entirety of our findings, including the appendixes and form a full IS Audit report. Additionally, the report consists of a Branch Position detailing: the date of the branch opening, period of audit, which is the time between the last audit and the current one, names of the auditors who were present, names of the present Branch manager, deputy manager and LAN managers with designation, strength of staff which is the number of employees in the branch and a list of IT Asset Inventory found. Then follows the list of irregularities found in the branch, be it un-updated registers, JDs with no fallback plans, presence of external internet, credit/debit cards and PINs provided at the same desk and so on. In the report, I must also recommend the possible solutions to these irregularities and the policy that they offend. After completing the report, I must send a copy to the head of the ICC Division as well as the Branch Manager of the branch I audited and keep a copy in the office.

5.3 Major Findings

Over the course of my internship, I have done about 24 of 37 Branch Audits and 3 Division Audits (at the Head Office) NCC Bank Ltd has conducted this entire year:

- Dhanmondi Branch
- Dakshin Khan
- Mirpur Branch
- Bhaban Branch
- Mirpur Road Branch
- Bijoy Nagar Branch
- JatraBari Branch
- Uttara Branch
- Baridhara Branch
- Banani Branch
- Bashundhara Branch
- Malibagh Branch
- Sonargaon Janapath Branch
- Gulshan Branch
- Narayanganj Branch
- Motijheel Branch
- Baridhara Branch
- Dilkusha Branch
- Moghbazar Branch
- Shyamoli Branch
- Islampur Branch
- Mitford Branch
- Babu Bazar Branch
- Mohakhali Branch
- IT Division (at the Head Office)
- Cards Division (at the Head Office)

- Data Center (at the Head Office)

Across these branches, I found many irregularities – some major, some minor and some repetitive. Most branches have similar problems: no fallback plan in JDs, registers not updated, CCTV time not aligned with real time, debit/credit cards and their PINs from the same desk, more than one user using the same domain, an overabundance of excess access permissions amongst employees, unclean network rooms, asset discrepancies, security issues in PCs, unauthorized applications, lack of training and many more.

Major issues come occasionally but more frequently with cause of concern: I found some PCs with external internet or with Remote access enabled allowing them to receive Wifi signals and PCs with access to Pen Drives. One branch completely lost their Audit trail report including previous Audit reports, fire extinguishers were out of date by 2 years in the head office (I discovered this when tagging along in meetings during my training phase), CCTV backup footage of 6 months were lost which is a serious problem as it means there is no record of possible misdeeds.

Chapter 6

Audit of Cards Division

6.1 Overview

In the latter half of my internship, my supervisor tasked me with helping in auditing the bank's Head Office, one being the Cards Division. This was a very big challenge considering, since it is an important aspect of a bank's core operations, there is very little scope or tolerance for error.

The Cards Division provides services including ATM servicing and deployment, internet banking, card payments, mobile financial services etc. . It lies under Branchless banking which is a distribution channel strategy used for delivering financial services without relying on bank branches. The auditing of this division is quite similar to that of branch audits but, at the same time, it has a greater number of control points to be aware of as it has several subdivisions to take account of. I had to do the regular computer auditing as shown above in Chapter 4, as well as make sure the following control points were also followed.

6.2 ATM/POS Transactions

ATMs and Point-of-Sale (POS) systems have made it easier for cardholders to withdraw cash, make payments to merchants and billing organizations and so on. These systems, however, are common targets for card skimming attacks. To ensure that consumers have faith in these systems, the bank should consider implementing some control points to combat fraudsters' assaults on ATMs and POS devices:

- Installing anti-skimming solutions on ATM devices to detect the presence of unknown devices placed over or near a card entry slot
- Implementing a PIN shield to prevent shoulder surfing to customers' PINs
- Implementing tamper-resistant keypads ensuring customers' PINs encryption during transmission
- Installing CCTV with each ATM enabling video surveillance of activities and preserving the footage for at least 6 months
- Introducing a centralized online monitoring system for Cash Balance, Loading-Unloading functions, Disorders of machines, etc.

- Deploying security personnel for all ATM devices on a 24 hour basis
- Inspecting all ATM/POS devices frequently to ensure standard practice (i.e., environmental security for ATM, anti-skimming devices for ATM, POS device surface tempering, etc.) Inspecting log sheets in ATM booth premises and centrally

6.3 Internet Banking

Information transmitted over public networks for internet banking purposes must be safeguarded from fraudulent and unauthorized disclosure or modification. As financial services are increasingly provided online, banks' internet systems must be insecure. As a safeguard, the Bank must develop a security plan and implement control points to maintain the confidentiality, integrity and availability of its data and systems:

- Implementing SSL(Secure Socket Layer)/TLS(Transport Layer Security) protecting the integrity of internet banking systems and data
- Implementing 2-FA (two-factor authentication) for online financial transactions
- Automatic termination of online sessions after a fixed period of time unless the customer is re-authenticated for the existing session to be maintained.
- Maintaining high resiliency and availability of online systems and supporting systems (such as interface systems, backend host systems and network equipment)
- Undertaking periodic penetration tests of the system and reporting it to competent authority
- Educating customers on online security measures to protect them in an online environment

6.4 Payment Cards

Payment cards give cardholders the freedom to shop whenever and wherever they want. Cardholders can make purchases in person by physically showing their cards to the retailer, or they can buy online, by mail or over the phone. Cardholders can also withdraw cash from automated teller machines (ATM) using their payment cards.

Payment cards come in a variety of forms, with magnetic stripe cards posing the greatest security risk. Card skimming attacks compromise sensitive payment card data stored on magnetic stripe cards. Card skimming can occur at any point during the payment card processing process, including ATMs, payment kiosks and POS terminals. To prevent this, the following can be done:

- Adequate safeguards to protect sensitive payment card data like encryption ensuring confidentiality and integrity of data in storage and transmission

- Secure processing of sensitive or confidential information
- Deploying secure chips with multiple payment applications supported to store sensitive payment card data
- Proper customer authentication through verification of PINs or passwords
- Secure management of PIN generating equipment
- Individual and separate card personalization, activation and distribution, PIN generation and distribution
- Implementation of security controls at payment card systems and networks
- Activating new payment cards upon customer's instruction
- Using one-time-password (OTP) as 2-FA for CNP (Card Not Present) transactions via the internet to reduce fraud risk
- Promptly notify cardholders via transaction alerts including source and transaction amount made on the customers' payment cards
- Setting risk management parameters according to risks posed by cardholders, the nature of transactions or other risk factors enhancing fraud detection capabilities
- Implementing solutions to follow up on transactions exhibiting unnatural behavior compared to cardholder's usual card usage patterns, investigate such transactions and obtain the cardholder's authorization prior to completing the transaction

Chapter 7

My Solo Project

7.1 Overview

The Report Managing System or Report Manager is a web app using HTML, CSS and Javascript for front end and PHP and mySQL for backend. It took some time, but after research and a lot of time in confusion, I figured out and visualized how I wanted this site to work and how it would look. Developing this site would help me learn and hone my skills in web development along with learning how to handle the front end expertly, link the front end with the back end and to manage the database. Unfortunately, with the department being occupied with the Core Banking System (CBS) project at the head office, I received very little assistance, so I approached this site as a solo project alongside my branch auditing duties.

7.2 Objectives

After completing this project, I intend to include the following functions in the site:

- A home page where the employee can view the documents they have sent to the managers and the head with respect to the dates they were sent on.
- Send reports to the managers and head easily through a simple form.
- The site will automatically notify the respective recipients of the reports via email.
- Add/edit/remove from a personal Audit template that auditors can follow when they are out auditing branches and departments.

7.3 Literature Review

Report Manager will be developed using HTML and CSS for a user-friendly front end, Javascript for functionality and PHP to connect to the back end database to store all the data. After researching other popular database management systems, user reviews, and talking to fellow coworkers some functions stand out:

- Easy Data Management: Inputting data should be fast and easy requiring little to no effort. Report Manager will have a simple method of adding reports to the database as well as sending them to the respective recipients.

- Proper Data History: Having a list of all data (or reports in this case) in the database and to view it all in one place as easily as scrolling down a list is a feature I intend on keeping in the site.
- User Friendly Navigation: Many users would like a management system that is easy to navigate. Many sites are cluttered with information that can seem distracting; a simple layout is best when it comes to accessing what you need easily.

Chapter 8

Analysis and Design

8.1 Planning

After thorough analysis, the following flowchart was developed to aid in the project.

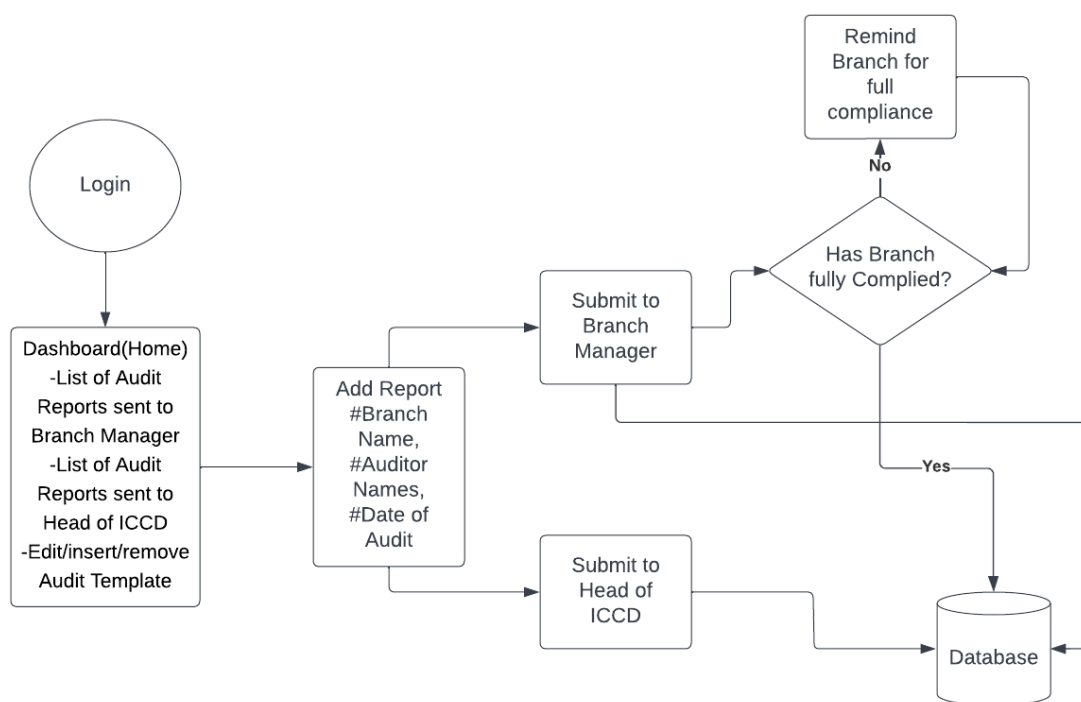


Figure 8.1: Flow Chart

Initially, the goal of the app is to send the reports to managers and the Head of ICCD and add them into the database. Each document sent will have a serial number and the current date attached to it. However, the auditor must provide the name of the branch audited, the names of the auditors present and the date of audit. Proper documentation is essential to a bank's information security. The serial number will act as a log number to how many reports have been transferred from the audit team. In future developments, a list of reports sent to the respective recipient will be added. It will act as a record of what document was sent and when. It will also include

a way for auditors to save a template for their audits and manage them at their will. This way, auditors will have a centralized platform of data they need in their everyday office use.

8.2 Analysis

After talking to multiple coworkers and taking their opinions into account, the main features of the app should be:

- Send Report to Head of ICCD
- Send Report to Branch Manager of the branch that was audited
- Have a way to manage a personal Audit Template

After analysis, the following Use Case Diagram was made:

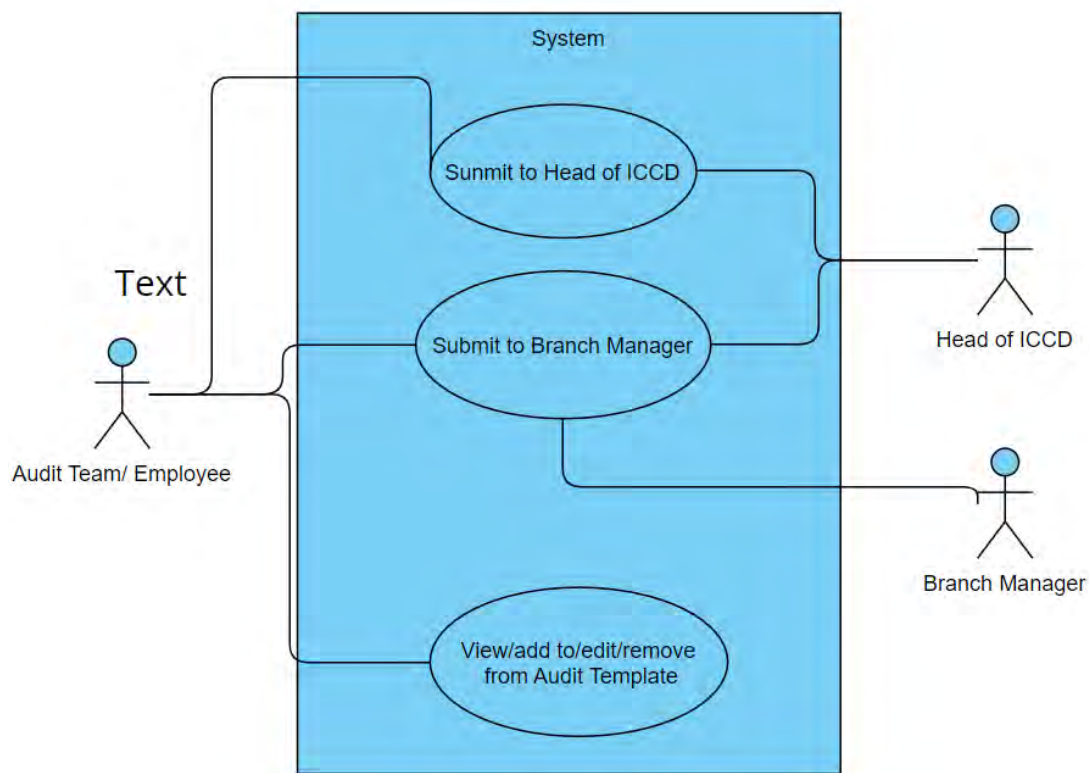


Figure 8.2: Use Case Diagram

As an auditor, you can add a report to be sent to both the branch manager and the Head of ICCD. The auditor will have to input the relevant information along with the report for it to be sent with proper documentation as well as to be updated into the database so that it can be listed and sorted accordingly. As the manager or head, you can only view the reports as editing it would ruin its authenticity. The following Activity Diagram was designed thusly:

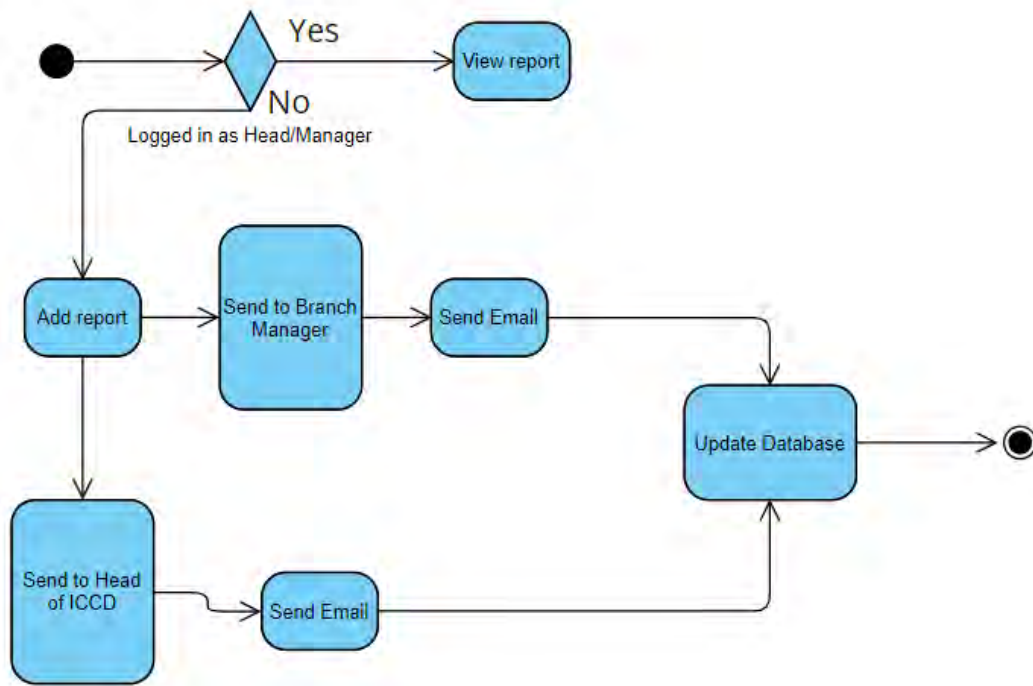


Figure 8.3: Activity Diagram

8.3 Design

To manage the back-end database effectively, an Entity Relationship graph was made as a guide. It denotes all the required fields needed for the tables in the database, where Primary Keys are done in bold and Foreign Keys are done in italic.

The Class Diagram shows the classes of the project with respective methods and the relationship between the classes. Reports class is basically the central component of the app which takes the emails from the respective manager and heads and sends the report files. Report log lists the reports in order of date sent. Audit template class will have methods to manage the template effectively.

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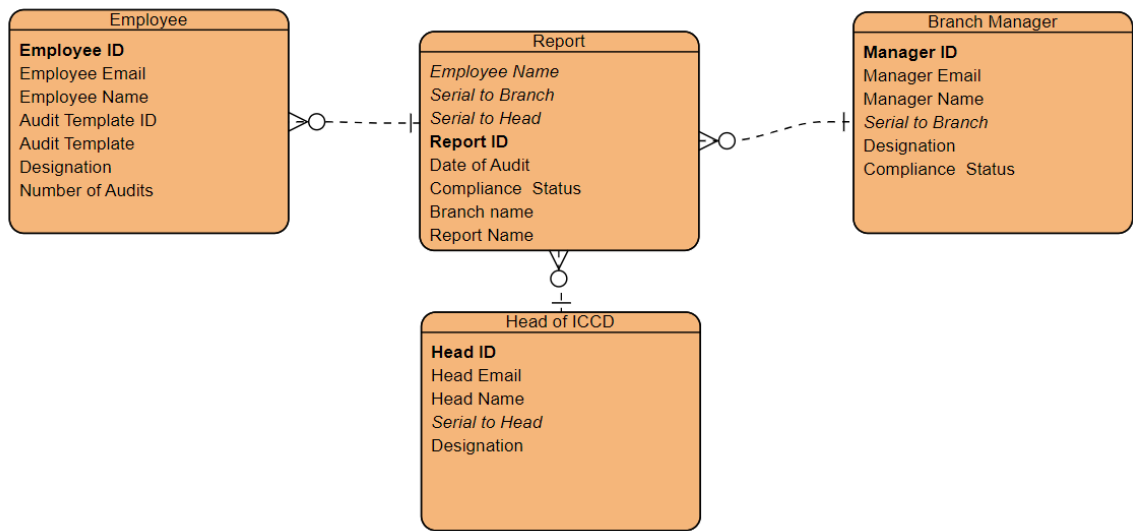


Figure 8.4: Entity Relationship Diagram

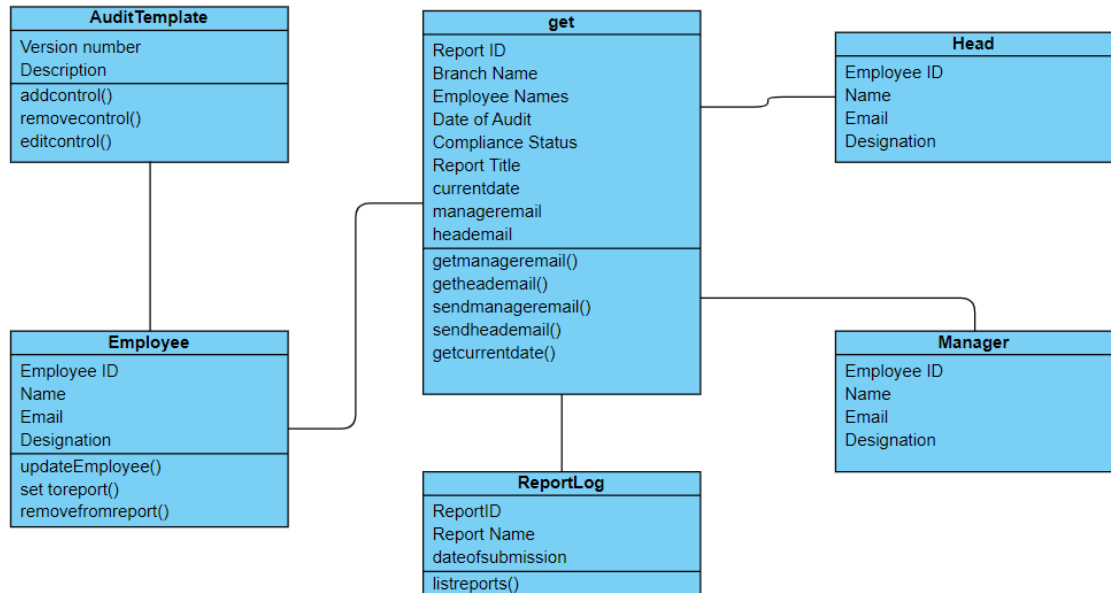


Figure 8.5: Class Diagram

Chapter 9

Implementation

9.1 Preliminary Development

The Report Manager aims to have a user-friendly UI which will open up to the main page after logging in, to see the lists of reports in order of date submitted which can be viewed with a click of a button, the audit template can also be accessed from the main page to be managed at will.

9.2 Front End

In the homepage the user can see a list of the reports sent in order of date submitted and view them at ease with the click of a button. The Submit form for sending reports look like this:



Figure 9.1: Home Page

Audit Report

To Head of ICCD

Report Name *

Report ID *

Date

Auditor Name *

Auditor ID

Auditor Email *

Designation *

Head Name *

Head Name *

Head Manager Email *

Message *

Compliance *
 Complied
 Not Complied
 Partially Complied

File Upload *

1/1 to 20 MB

Figure 9.2: Form

There will be two similar forms with the difference being the emails they are being sent to. One will be to the Head of ICCD and the other to a Branch Manager.

```

<form action="mailgunclient.php" enctype="multipart/form-data" method="post">
  <b><label for="rid" >Report Name </label></b><br>
  <input type="text" id="rid" name="rid" required><br>
  <b><label for="date" >Date </label></b><br>
  <input type="date" id="date" name="date"><br>
  <b><label for="aname" >Auditor Name </label></b><br>
  <input type="text" id="aname" name="aname" required><br>
  <b><label for="aid" >Auditor ID </label></b><br>
  <input type="text" id="aid" name="aid"><br>
  <b><label for="aemail" >Auditor Email </label></b><br>
  <input type="text" id="aemail" name="aemail" required><br>
  <b><label for="designation" >Designation </label></b><br>
  <input type="text" id="designation" name="designation" required><br>
  <b><label for="hname" >Head Name </label></b><br>
  <input type="text" id="hname" name="hname" required><br>
  <b><label for="hemail" >Head Manager Email </label></b><br>
  <input type="text" id="hemail" name="hemail" required><br>
  <b><label for="message" >Message </label></b><br>
  <input type="text" id="message" name="message"><br>
  <b><label for="compliance" >Compliance</label></b><br>
  <input type="radio" id="complied" name="compliance" value="Complied">
  <label for="complied">Complied</label><br>
  <input type="radio" id="notcomplied" name="compliance" value="Not Complied">
  <label for="notcomplied">Not Complied</label><br>
  <input type="radio" id="partialcomplied" name="compliance" value="Partially Complied">
  <label for="partialcomplied">Partially Complied</label><br>
  <input type="file" id="file" name="file" accept=".doc,.pdf" required><br>
  <input type="submit">
</form>

```

Figure 9.3: Value Assignment

This is the form code to take in all the fields given by the user. The HTML method post is used to send data from client side to server side of the codes. Since its never saved in the browser history, it is a safe method to use the data or store in database instantly.

9.3 Back End

```
if (isset($_POST)){
    $rid = $_POST["rid"];
    $date = $_POST["date"];
    $aname = $_POST["aname"];
    $aid = $_POST["aid"];
    $aemail = $_POST["aemail"];
    $designation = $_POST["designation"];
    $hname = $_POST["hname"];
    $hemail = $_POST["hemail"];
    $message = $_POST["message"];
    $compliance = $_POST["compliance"];
    $file = $_FILES["file"];
    //encodes file to base64
    $encoded_file = base64_encode(file_get_contents($_FILES['file']['tmp_name']));
}
```

Figure 9.4: Use of (dollar)post, method post and Base64 Encode file

This code snippet involves assigning the values given by the form using (dollar)post which receives the data sent by the method “post”. [9]

```
// Set up MySQL client using connection parameters
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$query = "insert into reports(ReportID, Date, Auditorname, AuditorID, AuditorEmail, Designation, Headname, HeadManagerEmail, Message, Compliance, FileObject)
values('$rid', '$date', '$aname', '$aid', '$aemail', '$designation', '$hname', '$hemail', '$message', '$compliance', '$encoded_file')";

if (mysqli_query($conn, $query)) {
    echo "New record created successfully";
} else {
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);
}

mysqli_close($conn);
```

Figure 9.5: MySQL Initialization, Code and Termination

Here I set up the mySQL client and check for connection. Once connected, I send a query to insert all the data from form into the database using the assigned values.

9.4 List Files

```
$query = "select * from reports order by Date;";
$records = mysqli_query($conn, $query);

$reports_list = "";
//pulls all rows into an array
while(($row = mysqli_fetch_assoc($records)) != NULL) {
    //encodes to what the browser understands
    $reportFile = json_encode($row['FileObject']);
    $reports_list = $reports_list . "
        <tr>
            <td><p>{$row['ReportID']}<br>
                {$row['Date']}</p>
                <button onClick=viewFile($reportFile)>View</button>
            </td>
        </tr>
    ";
}
```

Figure 9.6: List Reports Code and JSON Encode file

To make it so that the homepage lists the files in order the of date submitted, I first passed a query to do so and stored the query string into (dollar)query. This value is then passed through mysqli query() (which runs the query in the mySQL server) into (dollar)records and then again through mysqli fetch assoc() (which returns an associative array that corresponds to the fetched row) into (dollar)row. Then using (dollar)reportslist and the while loop, the file is then displayed on the homepage and can be viewed with a button. To view the pdf on browser was a tough challenge. I

```
<script>
    const viewFile = (report) => {
        //console.log(report)
        //opens new window
        let pdfwindow = window.open("")
        pdfwindow.document.write(
            //
            "<iframe width='100%' height='100%' src='data:application/pdf;base64, " + encodeURIComponent(report) + "'></iframe>"
        )
    }
</script>
```

Figure 9.7: Decode and View File

encoded the file as text with base64 [7] encode and then store it into the database. Then I had to encode it again with json encode so that the browser can understand what it is. Finally using javascript, when pressing the view button, it will open a new window, and display the file as a pdf after decoding using encodeURI.



Figure 9.8: Display PDF

9.5 Email

```
// Instantiate the client.
$mgClient = Mailgun::create('b77e4bbbae20392f9998ec892954bdea-8d821f0c-6c034402', 'https://api.mailgun.net');
$domain = "sandbox4a9491e1c7f547998a7749616b610413.mailgun.org";
$params = array(
    'from' => "$aname <mailgun@$domain>",
    'to' => "$hemail",
    'subject' => 'Hello',
    'text' => 'Testing some Mailgun awesomness!',
    'html' => "<h1>Here is the branch-report $rid</h1>",
    'attachment' => array(
        array("filePath" => $file["tmp_name"], "filename" => $file["name"])
    )
);
// Make the call to the client.
$filePath = $file["tmp_name"];
//dispatch email
$mgClient->messages()->send($domain, $params);
```

Figure 9.9: Mailgun Client using API to log in and send email

In order to send the email, since I could not use the network of the bank, I used Mailgun [5] which as an email delivery service that provides the user a unique API key and a sandbox domain for testing. [6]

9.6 Further Improvements

The Report Manager is far from perfect and will require multiple iterations of upgrades before it is good enough to use in the workspace. Encryption of data is a feature that is worth keeping in any DBMS especially in banks where security is of high importance. Branch Managers should also be able to send a Compliance letter back to the audit team, though it will not be recorded as an outgoing report. Furthermore, the functionality to integrate with other softwares would definitely be a plus so that it can be optimized increasingly.

Chapter 10

Self Growth

10.1 Overview

Over the course of my internship, I believe I grew as an employee and an individual. I have gathered a vast amount of knowledge, built and honed various skill sets and made connections. I can proudly say I have left a good impression on my coworkers with my work and attitude.

10.2 Personal and Interpersonal Growth

10.2.1 Attitude

A friendly attitude in social settings and a professional one in work settings can go a long way. Being friendly with my coworkers gained me numerous friends and connections. As time went on, I was well liked amongst my peers due to my friendly attitude. However, when it came to work, I was focused on what was in front of me, eager to complete it and eager for more work when done; this gained me respect for my work ethic and sincerity. Working in this internship gave me greater understanding of how to code-switch and balance the amiable connections I have with my coworkers, while maintaining my professional image.

10.2.2 Active Listening

Whether I am talking to someone, taking notes, or listening to a presentation, I have learned it is vital to be an active listener and be fully engaged, focus on what they are saying, ask questions and for clarifications, be interactive. It helped me form strong bonds with coworkers.

10.3 Professional Growth

10.3.1 Team Work Dependability

Over the course of my work in branches, I had a teammate who showed me how to do the tasks. Not long into our work we developed a good sense of teamwork where we could handle each other's shortcomings. It came to such a point where our seamless teamwork led us to finish out tasks very quickly and efficiently. In time,

my partner allowed me to do the entire auditing process alone with confidence as I became more and more dependable in the workplace.

10.3.2 Work Ethic

One of the skills I am proud of is having the ability to learn quickly on the job. It took me very little time to learn the audit cycle and to do the job effectively. The job also taught me to be incredibly meticulous in my findings, and to revise my work. Whenever I had doubts, I went through my work in case I missed any detail, which in turn helped write accurate reports. I managed to keep my workflow and quality of work consistent, according to my supervisor who was quite impressed with me; as well as managing to stay quite productive as I balanced my work and break timings.

10.4 Technical Growth

10.4.1 Bash Scripting

I gained knowledge of bash scripting as this project developed. I used bash scripting for automating setup deploying the project on the server. Additionally, bash scripting is essential for creating the project environment. I learned how to handle email services while working on this project. I learned How to use the API key, the domain and the appropriate code that it needs to work on backend easily.

10.4.2 Email Delivery Services

I learned how to handle email services while working on this project. I learned How to use the API key, the domain and the appropriate code that it needs to work on backend easily.

10.4.3 Encoding and Decoding

Encoding and decoding data can be very useful in moving data around and using it as you see fit, especially after knowing how it works. It is also incredibly critical in keeping sensitive data secure.

Chapter 11

Conclusion

It was a very pleasant time working at NCC Bank Ltd. Everyone I met was very friendly, very respectful despite being older than me and very interactive, which I appreciate very much as I would have hated to sit idle and just work. I was honored to find that I was very well liked amongst my peers and many even wanted me to extend my internship further to spend more time with me. Suffice to say, I could not have asked for a better work environment than this. Upon seeing my performance, I was deeply moved when I was offered, personally by the head of the division as well as my supervisor, to work full time after I graduate but since I had different plans, I had to politely decline. Working at the branches, I was exposed to a range of issues to deal with, and the more I handled them, the better I became at my work there. Where I initially used to hesitate, I made much quicker and decisive actions. Eventually, seeing my proficiency at auditing improving, I was relied on to do audits alone and was even given chances to audit important and high-profile divisions. Nevertheless, there is still a limitless amount of knowledge and skills to pursue and though I learned a lot from my work here, I am absolutely eager to learn more. Developing The Report Managing System or Report Manager on my own gave me a first-hand look on the difficulties of being a full stack developer. Designing the visuals of the front end and the functionalities of the back end is much more difficult than it seems at first. Although it is very basic and cannot even come near to the competition of other Database Management Systems, the Report Manager's goal is to be a simple easy to use app, to keep record of the documents the audit team is sending through a centralized server where all information can be stored, instead of relying on pen and paper and investing more time and effort than necessary. Learning from theory and learning from practical experience are vastly different. Personally, I prefer learning via on-hand experience. It gives you a first-hand experience on how the workplace operates, what to be aware of, how to interact with colleagues and navigating the hierarchy of the office, it also taught me to work well under pressure and scrutiny, to manage my time efficiently so that I can complete my tasks quickly, not take anything at face value as there might be underlying issues to visible to the common eye, to be informed at all times, and most important, be confident in myself and the work I put in. This 6 month internship was an incredible learning experience and I can assuredly say that I have worked hard during my time there.

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