STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

By

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CST/22/SWE/00921

SIWES TECHNICAL REPORT SUBMITTED TO THE DEPARTMENT OF SOFTWARE ENGINEERING, FACULTY OF COMPUTING, BAYERO UNIVERSITY KANO

Nigerian Communications Commission (NCC), Plot 423, Aguiyi Ironsi Street, Maitama, FCT, Abuja, Nigeria.

Duration of Industrial Training: 6 months

From: 25th November 2024 to: May 26th 2025

DECLARATION

I, Abdulrahim Usama Ladan, with Registration Number CST/22/SWE/00921, hereby declare that the industrial work experience program (SIWES) undertaken at Nigerian Communications Commission from 25th November 2024 to 26th of May was a valuable and enriching experience for me.

Signature and date

_____

Abdulrahim Usama Ladan

CST/22/SWE/00921

CERTIFICATION

This is to certify that Abdulrahim Usama Ladan, with CST/22/SWE/00921, has successfully completed the Student Industrial Work Experience Scheme (SIWES) at Nigerian Communications Commission, located plot 423 Aguiyi Ironsi Street, Maitama, Abuja from 25th of November to 26th of May.

Abdulrahim Usama Ladan   _____

Student   Signature & Date

Dr. Saratu Y. Ilu   _____

SIWES Supervisor   Signature & Date

Mr. Ashir Leko Ismail   _____

SIWES Coordinator   Signature & Date

ACKNOWLEDGEMENT

I offer my deepest gratitude to Almighty Allah for blessing me with a successful industrial program and the opportunity to witness this momentous occasion. My heartfelt thanks go to my parents, siblings and friends for their unwavering support, both financial and emotional, throughout my journey.

I am incredibly grateful to the management of Nigerian Communications Commission for providing me with valuable practical experience to complement my academic learning. I also extend my sincere appreciation to my dedicated lecturers for their tireless efforts in guiding me.

To the staff of Nigerian Communications Commission (NCC), I express my sincere gratitude for your support and mentorship

Finally, I cherish the friendships I made at NCC and I thank everyone for making this experience truly memorable. I love you all.

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1.1 Preamble

1.1.1 A Brief overview of SIWES

The Student Industrial Work Experience Scheme (SIWES) is a program initiated by the Federal Government of Nigeria through the Industrial Training Fund (ITF) to bridge the gap between theoretical knowledge acquired in tertiary institutions and practical experience in the industrial sector. Established in 1973, SIWES aims to expose students to real-world work environments, thereby enhancing their technical skills and preparing them for future employment. For students in science, engineering, technology, and related disciplines, SIWES is an essential component of their academic curriculum. It provides an opportunity to apply classroom knowledge to practical tasks, understand workplace dynamics, and develop professional competencies. The program also fosters a sense of responsibility, teamwork, and ethical conduct among students, which are crucial attributes in the professional world. During the SIWES period, students are attached to organizations relevant to their field of study, where they engage in various activities under the supervision of experienced professionals. This hands-on experience not only reinforces their academic learning but also equips them with the skills necessary to contribute effectively to the nation's economic and technological development.

1.1.2 A Brief Overview of the Organization

The Nigerian Communications Commission (NCC) is the independent regulatory authority for the telecommunications industry in Nigeria. Established by Decree No. 75 of 1992, which was later replaced by the Nigerian Communications Act (NCA) of 2003, the NCC is responsible for regulating the supply of telecommunications services and facilities, promoting competition, and setting performance standards for the industry.

Headquartered in Abuja, the NCC's mission is to support a market-driven communications industry and promote universal access. Its vision is to create a dynamic regulatory environment

that ensures universal access to affordable and equitable services, thereby supporting the nation's economic growth.

The Commission's core functions include:

- **Licensing and Regulation**: Issuing licenses to telecommunications service providers and ensuring compliance with regulatory frameworks.
- **Spectrum Management**: Allocating and managing the radio frequency spectrum to ensure efficient utilization.
- **Consumer Protection**: Safeguarding the rights and interests of consumers by enforcing quality of service standards and addressing complaints.
- **Promotion of Competition**: Encouraging fair competition among service providers to enhance service delivery and affordability.
- **Research and Development**: Conducting research to inform policy decisions and promote innovation in the telecommunications sector.

The NCC is structured into various departments, each with specific roles and responsibilities. One of the critical departments is the Information Technology (IT) Department, which oversees the Commission's internal IT infrastructure, ensuring seamless operations and service delivery.

1.1.3 Activities and Services of the Organization

The NCC engages in a wide range of activities aimed at regulating and promoting the telecommunications industry in Nigeria. These activities include:

- **Licensing of Operators**: The NCC issues licenses to telecommunications companies, ensuring that they meet the required standards and operate within the legal framework.
- **Monitoring Quality of Service (QoS)**: The Commission sets and enforces QoS standards to ensure that consumers receive reliable and efficient services. It monitors key performance indicators (KPIs) and takes corrective actions when necessary.
- **Spectrum Management**: The NCC allocates and manages the radio frequency spectrum, ensuring its efficient use and preventing interference among operators.

- **Policy Implementation and Research**: The Commission develops and implements policies to guide the growth of the telecommunications sector. It also conducts research to stay abreast of technological advancements and industry trends.
- **Consumer Advocacy**: Through its Consumer Affairs Bureau, the NCC protects the rights of consumers by addressing complaints, providing information, and ensuring transparency in service delivery.
- **Digital Transformation Initiatives**: The Commission promotes digital inclusion and innovation through initiatives like the Nigerian Telecommunications Indigenous Content Expo (NTICE), which encourages local participation in the telecoms industry.

Within the IT Department, the User Support and Networking Unit plays a vital role in maintaining the Commission's internal IT infrastructure. This unit is responsible for:

- **User Support**: Providing technical assistance to staff, resolving hardware and software issues, and ensuring optimal performance of IT resources.
- **Network Management**: Designing, implementing, and maintaining the Commission's network infrastructure, including local area networks (LANs), wide area networks (WANs), and internet connectivity.
- **System Administration**: Managing servers, databases, and other critical systems to ensure data integrity, security, and availability.
- **IT Security**: Implementing security measures to protect the Commission's IT assets from cyber threats and unauthorized access.

1.1.4 Ethics of the Organization

The NCC upholds a strong ethical framework that guides its operations and interactions with stakeholders. The organization's core values include:

- **Integrity**: The Commission conducts its activities with honesty, transparency, and accountability, ensuring public trust and confidence.
- **Professionalism**: Staff members are expected to demonstrate competence, diligence, and respect in their duties, maintaining high standards of service delivery.

- **Excellence**: The NCC strives for continuous improvement and innovation, aiming to achieve the highest levels of performance and customer satisfaction.
- **Fairness**: The Commission ensures that all stakeholders are treated equitably, promoting a level playing field in the telecommunications industry.
- **Responsiveness**: The NCC is committed to addressing the needs and concerns of stakeholders promptly and effectively.

These ethical principles are embedded in the organization's culture and are reflected in its policies, procedures, and daily operations. During my SIWES attachment, I observed and experienced these values firsthand, particularly in the collaborative and supportive environment fostered by the IT Department.

1.2 Students Objectives of the SIWES

The primary objective of my SIWES attachment at the NCC was to gain practical experience and enhance my technical skills in the field of Information Technology. Specifically, I aimed to:

1.2.1 Understand Network Connection and Topology

I sought to deepen my understanding of computer networks, including the various types of network topologies (such as star, mesh, and hybrid), and how they are implemented in real-world scenarios. This involved learning about the design, configuration, and management of network infrastructures.

1.2.2 Develop Proficiency in Microsoft Excel and Word

Proficiency in Microsoft Office applications is essential for data analysis, documentation, and reporting. I aimed to enhance my skills in Excel and Word to efficiently handle tasks such as creating spreadsheets, generating reports, and managing documentation.

1.2.3 Gain Basic Experience in Database Management

Understanding database systems is crucial for managing and retrieving information effectively. I aimed to acquire foundational knowledge in database management, including data entry, querying, and basic SQL operations.

1.2.4 Participation in Team-Based Computer Assembly

Hands-on experience in assembling and configuring computer systems is vital for IT professionals. I aimed to participate in team-based activities involving the assembly, installation, and maintenance of computer hardware.

1.2.5 Learn Point-to-Point Network Configuration

Configuring point-to-point networks is a fundamental skill in networking. I aimed to learn how to set up direct connections between devices, configure IP addresses, and ensure secure and efficient data transmission.

1.3 Overview of the Work Assigned during SIWES

During my SIWES attachment at the NCC's IT Department, I was actively involved in various tasks and projects that aligned with my learning objectives. These included:

- **Network Infrastructure Support**: Assisting in the setup and maintenance of network devices such as routers, switches, and access points. I participated in configuring network settings and ensuring optimal connectivity across the organization's departments.
- **User Support Services**: Providing technical assistance to staff members by troubleshooting hardware and software issues, installing applications, and ensuring the smooth operation of IT resources.
- **Database Management**: Engaging in data entry tasks, updating records, and learning basic SQL queries to retrieve and manipulate data within the organization's databases.
- **Hardware Assembly and Maintenance**: Collaborating with team members to assemble computer systems, install operating systems, and perform routine maintenance to ensure the reliability of hardware components.

- **Documentation and Reporting**: Utilizing Microsoft Excel and Word to document technical procedures, generate reports, and maintain records of IT activities and support requests.
- **Security and Compliance**: Observing and adhering to the organization's IT security policies, including data protection measures and access control protocols.

These experiences provided me with a comprehensive understanding of the practical aspects of IT operations within a regulatory organization.

1.4 Achievement

My SIWES attachment at the NCC was a transformative experience that significantly enhanced my technical competencies and professional development.

1.4.1 Skills Learned

- **Technical Proficiency**: Gained hands-on experience in network configuration, hardware assembly, and database management, which solidified my theoretical knowledge.
- **Software Expertise**: Improved my proficiency in Microsoft Office applications, enabling me to efficiently handle documentation and reporting tasks.
- **Problem-Solving Abilities**: Developed critical thinking skills by troubleshooting technical issues and implementing effective solutions.
- **Team Collaboration**: Learned the importance of teamwork and effective communication in achieving organizational goals.
- **Professional Conduct**: Adopted a professional demeanor, adhering to organizational policies and ethical standards.

These skills have prepared me for future challenges in the IT industry and have laid a strong foundation for my career development.

1.5 Summary

In conclusion, my SIWES attachment at the Nigerian Communications Commission provided me with invaluable practical experience in the field of Information Technology. Working within the User Support and Networking Unit of the IT Department allowed me to apply my academic knowledge to real-world scenarios, develop essential technical skills, and understand the operations of a regulatory organization.

The experience not only enhanced my technical competencies but also instilled in me a sense of professionalism, ethical conduct, and a commitment to excellence. I am confident that the skills and knowledge acquired during this period will significantly contribute to my academic success and future career endeavors in the IT industry.

CHAPTER TWO
LEARNING EXPERIENCE

2.1 INTRODUCTION

The Students Industrial Work Experience Scheme (SIWES) is an essential part of the Nigerian educational curriculum designed to provide students with practical experience in their field of study. It aims to bridge the gap between theoretical knowledge gained in the classroom and practical application in a real-world working environment. For a Computer Science student like myself, undertaking SIWES at the Nigerian Communications Commission (NCC) has been an invaluable opportunity to engage directly with the technologies, systems, and workflows that underpin the country's communications infrastructure.

The NCC, as Nigeria's regulatory authority for telecommunications, plays a critical role in ensuring efficient, reliable, and secure communication services across the nation. The commission's scope covers a wide array of services including the regulation of telecommunications operators, management of numbering resources, licensing, spectrum management, and consumer protection. Given the technical depth and operational complexity of NCC, it provides an ideal environment for practical learning, especially in areas such as network management, IT infrastructure, data handling, and user support.

My placement at NCC's Information Technology Department, particularly within the Networking and User Support units, offered me firsthand exposure to various facets of computer networking and IT management. This chapter presents a comprehensive overview of the projects and tasks I undertook during my SIWES program, how they relate to my academic knowledge, the challenges I encountered, and how I overcame them. It also reflects on the learning outcomes and the skills I developed throughout the internship.

2.2 PROJECTS UNDERTAKEN DURING THE PROGRAM

The NCC, being a multifaceted regulatory agency, provided a broad spectrum of tasks and projects relevant to my academic background and career goals. The work assigned to me was

designed to enhance my practical skills and deepen my understanding of network management, system administration, and IT support services.

2.2.1 Details of What Have Been Carried Out

During the SIWES program, my responsibilities were diverse and included several key activities aligned with the objectives of NCC's IT operations. These projects and tasks not only exposed me to real industry practices but also helped me build proficiency in the use of specialized tools and software applications.

Network Configuration and Topology Setup

During my SIWES training at the Nigerian Communications Commission (NCC), one of the major areas I was exposed to was network configuration and topology setup, which formed the backbone of the organization's IT infrastructure. This task was not only hands-on but also closely aligned with the theoretical networking concepts I had studied in school.

To begin with, I was introduced to different network topology structures, including star, point-to-point, and extended star topologies. In practice, the star topology was most commonly used within the NCC, especially in department-specific local area networks (LANs), as it offers centralized management and ease of troubleshooting. For instance, each department had its own access point that connected all the systems to a central switch, which then linked to the main server room. The point-to-point topology, on the other hand, was used in special cases such as direct connections between sensitive servers or high-security zones.

My role involved working with physical network devices like switches (mainly Cisco), routers, and wireless access points. I learned how to physically set up these devices and then logically configure them to ensure stable and efficient network performance. One of my key responsibilities was to assist in designing and implementing subnetting schemes that minimized IP conflicts and optimized the use of IP address space. We used private IP address ranges such as 192.168.x.x and implemented VLANs (Virtual Local Area Networks) to logically segment departments such as Human Resources, IT, Legal, and Finance.

Before jumping into real hardware, I used Cisco Packet Tracer, a network simulation tool that allowed me to virtually test configurations and topologies. This was crucial for building my confidence. For example, I practiced setting up a network involving three departments connected via switches and routers, configuring static routes and assigning IP addresses manually. This tool gave me a safe environment to experiment with routing protocols, subnet masks, default gateways, and address assignments.

Once confident with the simulations, I was assigned to assist in a real-world scenario: configuring a new office block's internal network. This included:

- Laying out a plan for connecting 20+ systems.
- Assigning IP addresses using a subnet mask of 255.255.255.0, giving each department its range.
- Creating three VLANs (HR, Admin, and Support), configuring inter-VLAN routing using a Layer 3 switch.
- Testing connectivity using ping and tracert commands.

This task wasn't without challenges. On my first real-world VLAN assignment, I mistakenly assigned overlapping IP ranges to two VLANs, which caused an IP conflict that temporarily disrupted network access in one department. However, with the help of my supervisor, I quickly identified the issue through network diagnostics tools and corrected the subnet ranges. That experience taught me the importance of careful planning, documentation, and version control when dealing with network configuration files.

I also assisted in access point installation and configuration, ensuring strong and secure Wi-Fi signals across office floors. We used SSID naming conventions and applied WPA2 encryption with enterprise-level authentication to secure the connections. During one installation, I had to trace cable paths and use a cable tester to check signal integrity this was my first time doing physical cable validation, and it helped me understand how important proper cable management is to reducing signal loss and avoiding physical damage.

My involvement extended to monitoring the network's performance, where I was introduced to basic network monitoring tools like SolarWinds and Wireshark. I observed how traffic analysis

could detect abnormal activity or congestion and how logs were used to maintain network health. I didn't just passively observe I was tasked with generating small reports using captured data, highlighting peak traffic hours and packet loss percentages.

All of these experiences deepened my understanding of the OSI model and TCP/IP protocols in real terms. For example:

- I worked more with Layer 2 (Data Link) for MAC address configurations and VLANs.
- Layer 3 (Network) was prominent in routing, IP addressing, and default gateway setups.

Reflecting on this experience, I realized how theoretical coursework in networking becomes significantly clearer when applied to a functioning system. It also helped me appreciate the importance of documentation, as I learned to maintain proper records of IP configurations, VLAN mappings, and device placements for future reference and scalability.

In summary, working on network configuration and topology setups at NCC gave me both technical and practical proficiency, exposed me to real-life problem solving, and strengthened my foundational knowledge in networking. It was one of the most engaging and insightful parts of my industrial training.

User Support and Helpdesk Operations

Another significant aspect of my SIWES experience at the NCC was my active participation in the User Support and Helpdesk Unit. This unit served as the frontline of IT support, and it gave me real-world exposure to the day-to-day challenges faced by users in a large organizational setup. As a student primarily focused on the technical and development side of software engineering, working directly with users was a refreshing change that taught me the value of clear communication, patience, and problem-solving under pressure.

My role in the unit primarily revolved around managing and resolving IT support tickets raised by staff across different departments. These tickets ranged from simple issues like printer malfunctions to more complex challenges such as network disconnections, software crashes, or

login failures. All user requests were tracked using a basic internal ticketing system where each complaint was logged, categorized, and assigned a severity level.

A typical day often began with checking the open tickets in the system. I would go through the list and pick tickets that matched my skill level or assist senior staff with more difficult cases. One of my first solo tasks was helping a staff member who couldn't access their official email on Outlook. After a bit of back-and-forth and guided troubleshooting, I discovered it was due to an expired password synced with their Active Directory account. I guided them through the reset process and reconfigured the Outlook settings to re-authenticate the account.

These sorts of issues helped me understand how tightly integrated systems like email servers, directory services, and authentication protocols are in real business environments. I also got hands-on with troubleshooting tools like:

- ipconfig and ping to check network connectivity
- Control Panel utilities for managing printers and installed software
- Microsoft Event Viewer for tracking system errors and crashes
- Antivirus logs to check for security-related disruptions

In some cases, I worked directly on user systems. This involved tasks like installing drivers, configuring new software tools, adjusting system settings, or scanning for malware. One situation I won't forget was assisting a finance staff member whose system was running abnormally slow. After doing some diagnostics, I realized that their laptop had several programs running at startup, including outdated antivirus software that was using too many system resources. I disabled unnecessary startup programs, removed bloatware, and installed a lightweight security solution. The system performance improved, and the staff was so relieved that they jokingly said I "resurrected their computer."

These experiences taught me not just technical problem-solving, but also interpersonal skills. I had to:

- Listen carefully to users who didn't always know how to describe their problems technically.

- Remain patient even when the issue was caused by user error.
- Communicate solutions clearly, without overcomplicating with jargon.

Working in a team also helped me develop my collaboration and escalation skills. When I couldn't solve a problem alone, I learned how to escalate it properly to a senior technician, but not before making sure I had tried basic diagnostics and noted all relevant details. This way, the issue could be handled efficiently without wasting the senior tech's time.

In addition to reactive support, I occasionally helped with proactive tasks like updating system software, installing security patches, and monitoring for recurring issues that hinted at deeper infrastructure problems. For example, when multiple users complained about unstable Wi-Fi connections in a specific office wing, we traced the issue back to a faulty access point and replaced it.

I also assisted in maintaining an IT support knowledge base a document that listed common problems and their solutions. I contributed by writing up a few entries on recurring issues I had resolved, such as network printer errors and VPN login failures. This helped me improve my documentation skills and understand the value of keeping reference material that other team members can rely on.

Overall, my time in the User Support and Helpdesk Unit showed me that technical knowledge alone isn't enough you need to blend it with people skills, empathy, and adaptability. I became more comfortable dealing with real users, grew more confident in handling unfamiliar problems, and developed a broader view of how IT support sustains daily business operations.

This part of my training was incredibly rewarding because it taught me how to translate theory into action in real-time situations, often under pressure. It also helped me understand that behind every ticket is a real person just trying to do their job so the faster and more empathetically I could help, the better everyone's day went.

Microsoft Office Suite Proficiency

During my SIWES program at the NCC, I had the opportunity to sharpen my skills in Microsoft Office tools, particularly Excel and Word. While I had previously used these tools for academic work, working with them in a professional environment pushed my usage from basic to intermediate (and in some cases, advanced). I learned how essential these tools are to the smooth daily operations of a large organization.

One of my first responsibilities involved data entry and formatting reports for various departments. I was given raw data sometimes in handwritten formats, PDFs, or disorganized spreadsheets and tasked with organizing it in a clear and readable structure. Using Microsoft Word, I learned how to format official documents professionally, including the use of headers, automatic page numbering, alignment, spacing, and styles for consistency. I also picked up how to create cover pages, embed tables, and generate table of contents using Word's referencing tools.

However, it was in Microsoft Excel that I spent most of my time and saw the most growth. One of the major tasks I handled was the creation of asset management spreadsheets. I developed a system that listed all devices in a department laptop, printers, access points, monitors, etc. with columns for serial numbers, assigned users, purchase dates, status (active, inactive, damaged), and location.

At first, it seemed like simple data entry, but I quickly realized the importance of using formulas and functions to make the sheet dynamic and intelligent. For instance, I used:

- VLOOKUP to fetch matching records from other sheets.
- IF statements to flag assets based on their status.
- Conditional formatting to highlight items nearing end-of-warranty.
- Data validation to restrict input errors (e.g., dropdowns for selecting status).
- Pivot tables to generate summaries like how many systems were assigned per department or how many were pending replacement.

Creating these sheets gave me a deep understanding of how Excel isn't just about numbers—it's a powerful organizational tool when used properly.

I also learned to design templates that could be reused by other interns and staff, with protected cells to avoid accidental edits, and explanation notes in comment boxes. These templates included daily maintenance logs, attendance sheets, and network performance trackers.

There were moments I had to merge my Excel and Word skills such as when I exported data from Excel into tables in Word for monthly reports, or when I used mail merge in Word to generate standardized letters using a name list from Excel.

Another useful experience was working with charts and data visualizations. I created bar graphs and pie charts to represent things like device distribution, network uptime percentages, or ticket resolution rates. I learned to clean and preprocess data first removing duplicates, ensuring date formats were consistent, and filling missing entries. Then I used Excel's "Insert Chart" feature to make visual data that could easily be interpreted by non-technical staff during presentations.

At one point, I was asked to prepare a short training document to help new staff understand how to read the reports I had been building. This was a great experience because it forced me to simplify technical things into something digestible, which also helped me reflect and reinforce my own learning.

Looking back, I realized that Microsoft Office Suite isn't just "basic office work" it's the foundation of documentation, reporting, and data organization. It's what keeps records traceable, reports readable, and internal processes standardized. Having a solid grasp of these tools can speed up tasks and reduce errors significantly.

This part of my SIWES helped me build more than just technical skills it improved my attention to detail, accuracy, and efficiency. I now see Excel and Word not just as tools, but as productivity weapons every IT person needs to wield well.

Basic Database Management

My SIWES experience at NCC also introduced me to the practical side of database management, particularly how it supports internal record-keeping, resource allocation, and data retrieval.

While I had already studied the basics of databases in school like SQL syntax, relational models, and normalization this was the first time I saw how they were applied in a real organization.

The organization used a structured relational database system to store and manage a variety of data. This included employee details, inventory records, login credentials (secured), helpdesk logs, and even network performance metrics. My involvement began with simple tasks, such as updating employee records, but over time, I was gradually introduced to more complex operations like querying the database and checking for inconsistencies in data entries.

To perform these tasks, I used a database client software (similar to phpMyAdmin or SQL Server Management Studio depending on the backend). I was given a read-and-write access role, but only to specific tables and with strict guidance and supervision from my supervisor. This helped maintain the security and integrity of the data.

One of my tasks involved updating an employee's department and location in the personnel table. Initially, I thought it was just a simple field edit, but my supervisor guided me to first query the record using a SELECT statement to confirm it exists:

```
SELECT * FROM employees WHERE staff_id = 'NCC1023';
```

Once confirmed, I used an UPDATE query:

```
sql
```

```
CopyEdit
```

```
UPDATE employees
```

```
SET department = 'ICT', location = 'HQ - floor 2'
```

```
WHERE staff_id = 'NCC1023';
```

This taught me how cautious you have to be even with small changes, especially when updating live data. A single mistake in the WHERE clause could update hundreds of rows at once.

I also assisted in data extraction tasks using SQL queries for generating reports. For example, I was asked to pull a list of systems that hadn't been updated or used for more than 3 months. I used the following query:

```
SELECT system_id, user_assigned, last_updated

FROM devices

WHERE last_updated < DATE_SUB(CURDATE(), INTERVAL 90 DAY);
```

This small but important task showed me how organizations use databases to track performance, spot trends, and make decisions. It also helped me understand that even simple data when queried well can unlock insights that influence actions, like replacing old systems or reassigning idle ones.

Another part of the job involved helping clean up duplicate records and entries. For example, in the helpdesk log, multiple entries were mistakenly created for a single incident due to system lag. I learned how to identify duplicates using GROUP BY and HAVING COUNT(*) > 1 and how to remove them properly using controlled deletion queries after backing up the table, of course.

Aside from SQL commands, I gained a deeper appreciation for data integrity rules, such as:

- Ensuring referential integrity between tables (e.g., a device can't be assigned to a non-existent staff ID).
- Applying input validation during updates to reduce human error.
- Maintaining proper table relationships, like one-to-many between users and devices.

This exposure helped me link my classroom knowledge of normalization and entity-relationship models to how databases are actually designed and maintained in a work environment. I even reviewed a couple of ER diagrams drawn by the internal IT team, which gave me insight into the backend structure and how the tables relate to each other.

Reflecting on this experience, I realized that databases aren't just for storage they're the nervous system of most organizations. Everything from employee identity to device allocation to network monitoring depends on clean, secure, and properly managed data.

In conclusion, the time I spent working with databases at NCC was short but impactful. It improved my SQL proficiency, made me more confident in interacting with real data, and showed me how much responsibility comes with managing information. This hands-on exposure was one of the most valuable technical takeaways from my internship, especially since I now feel more prepared for backend development and data-driven software design.

Team-Based Computer Assembly

One of the most practical and enjoyable parts of my SIWES experience at NCC was being involved in team-based computer assembly and configuration. Before the internship, I had some basic understanding of computer hardware from school and personal experience, but working in a real-world environment assembling systems for deployment gave me a deeper appreciation of how hardware and software come together to form a functional machine.

The task began with a bulk delivery of hardware components that needed to be assembled into fully functional desktop systems for staff use. Each system was to be customized based on the department's needs some required high memory for handling large datasets, while others were more general-purpose. I was assigned to a team of three interns under the supervision of a senior IT technician. We were responsible for assembling the machines from scratch, installing operating systems, and setting them up for network integration.

We started with the hardware assembly, which included:

- Installing the motherboard into the casing.
- Inserting RAM sticks (usually 8GB or 16GB depending on the spec).
- Fixing in storage drives mostly SSDs for speed.
- Mounting the power supply units (PSU) and connecting power cables properly.
- Installing cooling fans, especially in systems expected to run heavier processes.
- Ensuring all necessary ports (USB, HDMI, LAN) were properly aligned and functioning.

At first, I was slow and cautious, double-checking every step. One small mistake I made early on was incorrectly inserting a SATA cable, which led to the system failing to detect the drive during boot. Thankfully, my team helped me trace and fix it quickly. This reinforced the importance of patience, accuracy, and attention to tiny details, especially when dealing with physical hardware.

Once the physical assembly was complete, we moved on to software setup. We installed Windows 10 Professional Edition on most systems using bootable USB drives. I learned how to properly configure BIOS settings, select the correct boot sequence, and partition drives during installation. We also installed essential driver graphics, audio, network and ensured that Windows was properly activated using the organization's licensing system.

After the operating system was in place, we configured:

- User accounts (usually local admin + staff profile).
- Antivirus software and system firewalls.
- Default office applications, including Microsoft Office, PDF readers, and browser setups.
- Device-specific tools, like printer drivers or scanner utilities for staff who needed them.

Some systems were meant to connect directly to shared printers or file servers, so we also configured their network settings, ensuring each PC had a unique IP address (where static was needed) or was properly set to dynamic DHCP. We also added the systems to the organization's domain where applicable, allowing centralized control over user permissions.

What made this project unique was the collaborative approach. We worked as a team, splitting tasks while one person handled hardware, another started OS installation, and another ran initial tests. This improved our efficiency and gave everyone a turn to experience different parts of the setup process.

We documented each system's specs, serial number, assigned user, and date of deployment in a shared spreadsheet. This documentation was essential for asset tracking and future maintenance. I also learned how to label systems physically using printed stickers for easy identification.

Through this task, I gained a new respect for IT technicians. It's one thing to know how to build a PC in theory, but assembling and configuring 10+ systems in a day, troubleshooting unexpected BIOS errors, and ensuring everything works smoothly is another level entirely.

Reflecting on this experience, I now see computer assembly not just as hardware work, but as a crucial part of IT infrastructure management. Every properly set up system means less downtime, better productivity for staff, and fewer future issues for the IT team to fix.

This section of my internship gave me practical confidence and taught me how important teamwork, organization, and standard procedures are when dealing with hardware rollouts in a real-world environment.

Point-to-Point Network Configuration

Another important area I was privileged to explore during my SIWES program at NCC was Point-to-Point (P2P) Network Configuration. Unlike the more familiar LAN setups I had worked on earlier, this section dealt with direct network connections between two physical locations, often separated by long distances. These connections are critical for securely linking remote buildings, departments, or server units without relying on third-party internet services.

In simple terms, a point-to-point link creates a dedicated communication line between two nodes like two buildings in different parts of the same campus. My first exposure to this concept came during a project involving the extension of network access to an administrative office located in a separate building from the main server room. I got to observe and later participate in setting up both fiber optic and wireless point-to-point links to achieve stable, high-speed communication.

Wireless Point-to-Point Setup

For the wireless connection, we used radio-based outdoor devices (Ubiquiti NanoStation was mentioned during the briefing) mounted on poles at the roof level. These devices required line-of-sight (LoS) for stable transmission, so a big part of our planning involved physically scouting the path between the two buildings to ensure no obstructions like trees or water tanks were in the way.

We configured the access point (AP) and station units by:

- Assigning them static IPs.
- Setting the operating frequency/channel.
- Matching SSIDs and enabling encryption (WPA2).
- Aligning them physically using signal strength indicators.

I was particularly fascinated by how simple misalignment could drastically reduce signal quality. We used a signal meter app to fine-tune the direction until we got optimal strength. Once set up, we tested latency and throughput using ping and speed tests. The connection provided seamless remote desktop access and large file transfers between the two sites showing how wireless P2P can rival cable when configured well.

Fiber Optic Configuration

The second part of the project involved extending an existing fiber optic line to a newer part of the office. Here, the work was more hardware-focused. I assisted in:

- Identifying the existing fiber trunk in the server room.
- Using a fiber patch panel to connect new cables.
- Labeling ports and connections.
- Using OTDR (Optical Time Domain Reflectometer) to test fiber integrity and identify any signal loss.

Compared to wireless, fiber optic connections offer lower latency, higher speed, and immunity to interference but they require more careful handling and physical protection. I was amazed to learn that even small bends in the cable could affect signal flow, so routing had to be planned with precision.

After installation, we configured the network devices at both ends typically routers and switches to establish the link, assign IPs, and verify stability. One of the challenges we faced was packet drops during initial testing, which turned out to be caused by a loose connector inside one of the

SFP ports. This real-life debugging scenario taught me how physical and logical layers (OSI Layer 1 and Layer 3) are tightly linked in infrastructure work.

Reflection and Learning Points

This part of my internship gave me a big-picture view of telecom networking beyond just setting up computers and routers inside a room. I learned:

- The importance of physical planning in network design.
- How to balance cost and performance between fiber and wireless solutions.
- How to test and troubleshoot long-distance connections.
- The role of redundancy in one setup, a backup wireless link was configured in case the fiber ever went down.

I also saw how P2P links are essential in enterprise-level environments, especially where departments are spread across multiple buildings or remote sites. These links ensure smooth data flow, secure file transfers, and uninterrupted communication making them the hidden backbone of organizational efficiency.

Working on point-to-point setups expanded my knowledge from local networking into wide-area concepts, and showed me that building and maintaining infrastructure is just as important as writing code or designing UIs.

2.2.2 Reflection on the Practical Application of Academic Knowledge

The Students Industrial Work Experience Scheme (SIWES) is designed to provide a bridge between theoretical academic knowledge and real-world industrial practice. My SIWES placement at the Nigerian Communications Commission (NCC) proved to be a valuable extension of my classroom learning, offering a space where I could apply, test, and refine concepts I had previously encountered in various courses from Levels 1 to 3. This section reflects on how specific academic knowledge influenced and supported my performance during the program, as well as the areas where practical work deepened my understanding.

1. Application of Networking Knowledge

My involvement in several networking-related activities during the SIWES program provided one of the most direct applications of academic knowledge to professional practice. From basic network configuration and topology setup to advanced point-to-point connectivity planning, I frequently drew upon principles from the course Data Communications and Networking (ITC3303). The practical configuration of routers, switches, VLANs, and IP addressing schemes provided a real-world context for theories such as the OSI model, TCP/IP stack, and subnetting taught in the classroom.

Additionally, knowledge gained from Computer Architecture and Organization I (CSC2206) complemented this work, particularly in understanding how data is transmitted, routed, and handled at both hardware and protocol levels. The SIWES work helped me gain clarity on how hardware components like network interface cards (NICs) interact with upper-layer software configurations to maintain communication between systems.

The experience also validated the topics covered in Analysis of Algorithms (CSC2204), as I saw firsthand the role of algorithmic efficiency in protocols like routing and packet handling, especially when monitoring network latency and throughput in point-to-point wireless connections.

2. Software Engineering and Application in Technical Processes

While the SIWES program was not primarily software-development focused, many tasks I handled required the structured and procedural thinking taught in Introduction to Software Engineering (SWE2301) and Software Engineering Process (SWE2211). I applied process modeling techniques when working on team-based hardware projects and followed systematic approaches during helpdesk ticket resolution and documentation.

One of the most significant applications came from System Testing, Integration and Quality Assurance (SWE3202). In assembling and preparing systems for deployment, I was responsible for verifying driver compatibility, testing hardware components, ensuring system stability, and confirming successful software installations. These tasks highlighted the importance of validation, error-checking, and quality control procedures in practical IT environments.

Moreover, my exposure to software installation, updates, and configuration gave practical meaning to the lessons taught in Operating Systems I (CSC2210). Understanding how operating systems manage resources and permissions, how they boot, and how services are configured enhanced my efficiency in system setup and problem-solving.

Courses like Object-Oriented Programming (SWE3311) and Computer Programming II (SWE2314) indirectly supported my understanding of application behavior. While I did not develop applications from scratch, working with system software required me to troubleshoot configurations, understand exception messages, and even interpret basic logs that reflected software operations and system events.

3. Real-World Implementation of Database Management Concepts

Another area where academic learning found direct application was in database management. My participation in updating and querying organizational databases was an opportunity to apply knowledge from Database Management Systems (ITC3305) and System Analysis and Design (SWE2315). Concepts such as primary keys, relationships, entity-relationship modeling, and normalization became relevant during data entry, query formulation, and performance validation.

Running SELECT, UPDATE, and DELETE queries using structured query language (SQL) allowed me to experience how data integrity is preserved in live environments. In helping manage datasets related to staff, asset tracking, and system logs, I encountered real-life constraints on data operations particularly the need for data accuracy, consistency, and secure access.

This experience also provided a bridge to my earlier exposure in Introduction to Application Packages (CST1301) and Fundamentals of IT (ITC1203), which laid the foundation for understanding software tools used for database interfacing. Through this hands-on application, I became more confident in handling backend data responsibilities.

4. Use of Microsoft Office Tools in Professional Contexts

During my internship, I worked extensively with Microsoft Excel and Word, especially for asset tracking, report generation, and technical documentation. While these tools are often underestimated, the experience revealed how essential they are to modern IT roles. I applied formatting, data structuring, and function-based logic learned from Introduction to Application Packages (CST1301) and deepened during the internship.

In Excel, I used advanced functions such as VLOOKUP, IF, and COUNTIF, and also explored pivot tables and conditional formatting. The use of data validation and lookup formulas supported tasks like creating asset registers and summarizing device allocations across departments. Word was equally important, especially for formatting reports and preparing guides for new staff.

This practical experience emphasized that IT proficiency extends beyond coding or networking it also involves communication, organization, and clarity. These tools, while general-purpose, play a critical role in internal documentation and communication in every organization.

5. Hardware and System Assembly Supported by Foundational Courses

Team-based computer assembly at NCC was one of the most hands-on parts of my internship. The practical tasks I carried out installing motherboards, power supply units, hard drives, RAM, and configuring operating systems aligned closely with the knowledge acquired in Computer System Theory (CSC2211) and Computer Architecture (CSC2206).

Understanding how buses, memory hierarchies, and CPU components work enhanced my hardware decision-making during assembly. For instance, selecting RAM with the right speed and form factor, checking BIOS settings before OS installation, and installing system drivers all reinforced lessons I had previously studied in abstract.

In addition, this experience built on the problem-solving techniques introduced in Introduction to Problem Solving and Software Development (SWE1301). Troubleshooting non-booting systems, faulty connections, or driver incompatibility all required logical reasoning and step-by-step debugging skills grounded in my early programming and problem-solving courses.

6. Practical Cybersecurity Awareness

Although I did not perform deep cybersecurity operations, several activities during SIWES exposed me to foundational security practices, especially while setting up systems, configuring firewalls, and updating antivirus software. These activities supported the lessons from Fundamentals of Cybersecurity I (CBS1202) and Fault Tolerant Computing (CBS3209).

I saw how endpoint security is enforced through access controls, password policies, software restrictions, and regular updates. Observing these practices in a real-world environment helped me understand the challenges of implementing security while maintaining usability and accessibility.

7. Human-Centered Support and Interpersonal Skills

A critical component of my internship was handling IT support tickets and assisting users with various system problems. My experience in this role brought to life the lessons from Human-Computer Interaction (SWE2204), particularly in understanding how people interact with systems and how to improve usability.

Providing support required more than technical knowledge it involved patience, clear communication, and empathy. Courses like Use of English (GSP1201) and Logic and Philosophy (GSP2205), while seemingly unrelated to IT, indirectly contributed to my effectiveness in drafting help documents, explaining solutions, and engaging with non-technical users.

Additionally, I found my understanding of Peace Studies and Conflict Resolution (GSP2206) useful in situations that involved coordination with other departments or when managing frustrated users. The ability to remain composed, listen attentively, and guide users patiently was crucial.

8. Teamwork and Collaboration Skills

Throughout the internship, I worked in various teams assembling computers, configuring networks, and handling projects. These experiences showed me that professional success in software engineering depends not only on individual knowledge but also on one's ability to work

collaboratively. While not tied to a specific course, these soft skills are fostered throughout the curriculum and are especially emphasized in courses like Software Engineering Process (SWE2211) and System Analysis and Design (SWE2315).

Group tasks taught me how to divide responsibilities, communicate effectively, share feedback, and support team members when challenges arose. These are vital competencies that will shape my future roles in development teams, network administration, or support engineering.

9. Overall Growth and Integration

Finally, the SIWES experience helped me realize the integration between various academic subjects. For example, while Discrete Structures (CSC2323) and Linear Algebra I (MTH2205) did not directly apply in a visible form, the analytical mindset and logical rigor they build helped me in structuring queries, organizing spreadsheets, and troubleshooting networks.

Similarly, courses like Use of Library and ICT (GSP1202) encouraged information literacy, which supported my ability to search for solutions, follow manuals, and document my work properly.

This reflection has made it clear that no academic course stands alone all are interconnected and collectively prepare students for industrial settings. SIWES gave me the opportunity to discover these connections and understand how theory is not just knowledge but a preparation for action.

2.2.3 Challenges Faced and How They Were Overcome

A. Technical Challenges

2.2.3.1 Challenge: Adapting to Real-World Network Configuration
Introduction
One of the earliest and most prominent technical challenges I faced during my SIWES program at the Nigerian Communications Commission (NCC) was adapting to the complexity and speed of a real-world networking environment. As someone who had only experienced networking through theoretical coursework and simulations in tools like Cisco Packet Tracer, the sudden exposure to actual infrastructure involving routers, switches, access points, VLANs, and IP

configurations presented a steep learning curve. The network architecture at NCC was more layered and dynamic than anything I had encountered in class, which demanded a shift in both mindset and practical ability.

Challenge

Initially, the main difficulty stemmed from the transition between theory and practice. In school, I had learned about IP addressing, subnetting, OSI models, and protocols. However, at NCC, these principles were applied across a live enterprise-scale network where misconfigurations could affect multiple departments. Configuring routers and switches was not as straightforward as drag-and-drop simulation work. The syntax required precision, the devices used vendor-specific firmware interfaces, and the need for security and documentation added additional pressure. For example, during a routine task involving VLAN setup, I mistakenly assigned overlapping IPs to two different subnets, which caused a temporary disruption in communication between workstations in separate departments. This mistake, though quickly caught and resolved by a senior technician, highlighted how small missteps in configuration could have widespread consequences in a production environment.

Furthermore, I encountered unfamiliar hardware devices and cabling structures such as fiber optic patch panels, optical modems, and different switch models tools and systems that were not covered extensively in our undergraduate curriculum. The range of devices required not just plug-and-play knowledge, but a deep understanding of the functionality, port management, and interface configurations. Every network decision had to be made with scalability and maintainability in mind, something that is rarely emphasized in academic settings.

Solution

Overcoming this challenge required a deliberate and proactive approach. I began by allocating extra time after office hours to review configuration scripts, device manuals, and real-world tutorials on platforms like Cisco's knowledge base and YouTube. I re-visited course materials from ITC3303: Data Communications and Networking and CSC2206: Computer Architecture and Organization I, now looking at them through the lens of actual implementation rather than abstract understanding.

I also asked questions constantly. Senior staff members and network administrators at NCC were generous with their knowledge, and I made it a point to document every configuration I observed

or practiced. I also engaged in mock configurations on Packet Tracer and then compared the differences when setting up similar topologies using real Cisco and TP-Link devices in the field. In situations where I was unsure, I practiced caution and double-checked configurations using device logs and dry-run testing before final implementation. Gradually, I gained not only confidence but competence. By the third week of my internship, I was able to configure and troubleshoot network segments with minimal supervision. Tasks that once felt intimidating such as assigning static routes, configuring trunk ports, or handling access control lists (ACLs) became routine. The real victory came when I was independently tasked with redesigning a small department's internal network layout, which I completed successfully after proper planning and supervisor review.

Key Takeaways

This challenge taught me that theory is only half of technical competence. Real-world networking is dynamic and full of variables that require a blend of foundational knowledge, hands-on skills, and adaptability. I realized that documentation, backup planning, and logical structuring are just as important as technical command-line entries. It also taught me that mistakes are a part of the learning process as long as they're met with accountability and a desire to improve.

Ultimately, adapting to NCC's network environment transformed my classroom knowledge into functional expertise. I learned how to think like a network engineer solving problems not just technically, but also strategically, with an eye on performance, reliability, and scalability.

2.2.3.2 Challenge: Limited Resources and Equipment Availability

Introduction

Resource availability plays a critical role in the efficiency and success of technical work in any organization. At NCC, despite being a well-equipped institution, there were times when certain tools, devices, or software were either unavailable, under maintenance, or reserved for other ongoing operations. As an intern, this presented a unique challenge especially when the delay in accessing a specific tool or hardware component halted or slowed down my assigned tasks. It became clear that the real-world environment does not always guarantee immediate access to every resource, and learning how to navigate these limitations was a necessary part of the internship experience.

Challenge

The limitations I faced during my internship were not due to the absence of infrastructure, but rather the demand and scheduling conflicts surrounding the use of available resources. For example, during a scheduled computer assembly and deployment for a new office wing, the team had to wait for several system units and network switches that were still in use for temporary testing in another department. As a result, we couldn't begin the setup on time, and the delay impacted both our workflow and the expectations of the department awaiting the setup.

On another occasion, I needed to test a network configuration on physical routers to validate a design I had simulated earlier in Cisco Packet Tracer. However, the only available router was undergoing a firmware update for another critical task. Without the ability to test my configuration on actual hardware, I had to pause progress and defer the report I was preparing. These types of bottlenecks were frustrating and at times demotivating. Internally, I felt pressured to perform quickly, yet lacked the tools to proceed efficiently. Unlike academic environments where resources are often simulated or assumed, professional settings come with constraints—hardware may be occupied, software licenses may be limited, and IT personnel are shared across departments.

Solution

To cope with this challenge, I had to adopt a flexible and resourceful mindset. First, I communicated openly with my supervisor about resource availability and task prioritization. If a particular device or software was not accessible, I looked for alternatives: either practicing the same task in a simulation environment or shifting to another pending assignment that did not require the blocked resource.

For example, when routers were unavailable, I redirected my focus to documenting the configuration scripts and preparing the layout diagrams, which I later used to implement the setup once the routers became available. This allowed me to stay productive and avoid idle periods.

In situations involving hardware, I coordinated with other interns or units to pool resources where possible. On one occasion, when two teams needed the same switch models, we agreed on a shared timeline and booked usage slots to minimize conflict. I also learned to anticipate resource bottlenecks and plan ahead. If I knew a task required a particular tool or system, I would confirm its availability in advance and reserve it early whenever possible.

Moreover, I adopted documentation and note-keeping practices that helped me make the most of indirect exposure. When another team was handling equipment I couldn't use, I observed, took notes, and later replicated the process in a controlled environment or simulation tool.

Key Takeaways

The experience of working under resource constraints taught me an important lesson in **adaptability and prioritization**. In real-world technical environments, not everything will go as planned. Tools may not be readily available, and unforeseen delays are common. What matters is the ability to adapt without losing productivity. I learned that **time management is not just about scheduling work, but also about adjusting in real time when obstacles arise**.

It also highlighted the importance of soft skills **communication, collaboration, and negotiation** in navigating shared work environments. I came to understand that being technically competent is only one part of being a valuable team member. Knowing how to handle situations where resources are scarce without blaming others or becoming disengaged is a mark of professional maturity.

Through this, I became more disciplined in task scheduling, more collaborative in shared environments, and more strategic in managing my learning goals even when conditions

B. COMMUNICATION BARRIERS

2.1 Challenge: Explaining Technical Concepts to Non-Technical Staff

Introduction

During my SIWES experience at NCC, one of the most eye-opening challenges I faced was not technical in nature, but communicative explaining technical issues and solutions to non-technical staff. As someone trained in programming, networking, and system design, I was comfortable dealing with concepts like IP addressing, configuration scripts, or operating system bugs. However, when these technical matters affected end-users, it became my responsibility to translate these complex concepts into language they could understand. Bridging the gap between technical knowledge and user-friendly communication proved more difficult than expected, especially in high-pressure support situations.

Challenge

The difficulty began to show during my work in the User Support and Helpdesk Unit. Staff members from departments like administration, legal, and finance often raised tickets for issues

ranging from slow systems and missing files to access restrictions and network drops. While the root causes were often straightforward from a technical perspective, the explanations required to satisfy and educate the users were far from simple.

For example, there was a case where a user couldn't access shared files from the server. The issue stemmed from a broken network path due to a recently changed VLAN configuration. However, explaining "your VLAN tag changed and DNS isn't resolving the hostname" was met with blank stares. The user only wanted to know why they couldn't access their folders and when it would be fixed.

In another instance, I had to walk a staff member through the steps to reset their system password, which involved BIOS-level intervention. I found myself stumbling over explanations, unintentionally using technical jargon like "boot priority," "admin override," and "firmware-level authentication," which confused and frustrated the user.

These incidents made it clear that even though I had technical knowledge, my ability to support users depended equally on my ability to communicate clearly, calmly, and without condescension. The challenge wasn't lack of knowledge it was translating that knowledge into terms that others could relate to.

Solution

The turning point came when I realized that empathy and simplification are as essential in IT support as technical accuracy. I began observing how experienced staff handled such interactions. They used analogies comparing network paths to roadmaps, or describing cache clearing as "cleaning out a closet." I adopted these techniques and started building a small mental toolkit of simplified explanations for common issues.

Instead of saying "your system's memory is overloaded," I'd say "your computer has too many tasks open at once, like someone trying to carry too many files it gets tired." Instead of talking about IP conflicts, I'd describe it as "two machines having the same house number so delivery (data) gets confused." These metaphors helped users feel less intimidated and more cooperative during troubleshooting.

I also practiced active listening instead of jumping to conclusions, I let users describe the problem in their own words, no matter how vague. I'd then ask clarifying questions to narrow down the issue, which built trust and made users more patient.

In terms of technical documentation, I started writing quick guides and FAQs in simple language for common problems, which were later adopted by other interns too. These guides avoided technical overload and focused on actionable steps.

Additionally, I revisited some of the foundational lessons from Use of English (GSP1201) and Human-Computer Interaction (SWE2204). These courses had emphasized clarity, structure, and user experience concepts I now understood not just as theory, but as essential skills for IT professionals.

Key Takeaways

This challenge made it clear that technical knowledge is not enough if you can't make others understand it. Being a great support staff member or engineer means learning how to adjust your language and tone based on your audience. I learned that communication is not about simplifying the truth it's about delivering the truth in a way that's useful.

The experience also improved my patience and listening skills, which are crucial in client-facing roles. I gained confidence in user interactions and started receiving positive feedback from staff for being approachable and easy to talk to.

In the long run, I now see communication as a core technical skill as vital as coding or configuring a switch. This shift in perspective has prepared me not just for backend roles, but for collaborative environments where clarity, empathy, and explanation matter just as much as execution.

2.3 SUMMARY

In summary, my SIWES program at the Nigerian Communications Commission was a highly enriching experience that complemented my academic education with practical skills and professional insights. The projects and tasks I undertook exposed me to core IT and networking operations, strengthening my technical capabilities and enhancing my understanding of the telecommunications industry.

The hands-on involvement in network configuration, user support, database management, and team-based activities helped bridge the gap between theory and practice. Despite the challenges

encountered, the solutions and strategies I developed improved my resilience and adaptability, key traits for any IT professional.

Overall, the SIWES placement was an important milestone in my career development, providing me with a solid foundation to build upon in future academic pursuits and professional roles. The knowledge and experience gained at NCC have significantly shaped my perspective and motivated me to continue learning and growing within the field of Information Technology.

CHAPTER THREE
CONCLUSIONS & RECOMMENDATIONS
3.1 CONCLUSION

The Students Industrial Work Experience Scheme (SIWES) is a critical component of the academic curriculum designed to provide students with hands-on experience in their chosen fields. My SIWES placement at the Nigerian Communications Commission (NCC) has been an immensely valuable journey, bridging the gap between theoretical knowledge and practical application. This experience has allowed me to immerse myself in the dynamic and technically complex environment of a regulatory body that oversees telecommunications across Nigeria.

Throughout the internship, I was exposed to various facets of Information Technology and networking, including network configuration, user support, database management, and teamwork in computer assembly. These activities helped me understand not just the technical aspects but also the operational workflow of a large organization. The practical experience complemented my academic studies by enabling me to apply theories learned in the classroom to real-world problems.

One of the key takeaways from this experience is the importance of adaptability and continuous learning in the IT field. Technology is ever-evolving, and being able to quickly acquire new skills, troubleshoot unexpected issues, and work collaboratively with others are essential attributes for success. The challenges faced during my placement, such as managing complex network configurations and addressing user support queries, pushed me to develop problem-solving skills and patience.

Moreover, the exposure to the NCC's role in regulating and managing the nation's communications infrastructure broadened my perspective on the telecommunications industry's significance. It highlighted how integral effective communication networks are to the socio-economic development of a country. Understanding this regulatory environment gave me insights into how policies, technical standards, and compliance measures shape the industry.

In summary, my SIWES program was not just about gaining technical skills; it was an eye-opening experience that fostered professional growth, self-confidence, and a deeper appreciation

for teamwork and organizational dynamics. The lessons learned and skills acquired will undoubtedly serve as a strong foundation for my future academic pursuits and career in Information Technology.

3.2 RECOMMENDATIONS

Based on my experiences during the SIWES program at NCC, I offer several recommendations aimed at improving the internship program for future students and enhancing operational effectiveness within the organization.

For Future SIWES Students

1. **Be Proactive and Eager to Learn**
   The workplace is an excellent learning environment if students take initiative. Future interns should actively seek out opportunities to learn beyond assigned tasks. Asking questions, volunteering for additional projects, and showing enthusiasm can significantly enrich the experience.

2. **Develop Strong Communication Skills**
   Effective communication is vital in any professional setting. Students should work on explaining technical concepts clearly to non-technical colleagues and learn to listen carefully to user needs. These interpersonal skills are often as important as technical expertise.

3. **Master Time Management**
   Balancing multiple tasks is common in workplace environments. Interns should prioritize responsibilities, set realistic goals, and use planning tools to manage their workload efficiently. Good time management reduces stress and improves productivity.

4. **Embrace Teamwork**
   Many projects require collaboration. Students should learn to work cooperatively with diverse teams, respect different viewpoints, and contribute positively to group efforts. Team skills are highly valued by employers.

5. **Document Learning and Challenges**
   Keeping a detailed log of daily activities, challenges faced, and solutions found helps

reinforce learning and provides useful material for report writing. It also aids reflection and continuous improvement.

For the Nigerian Communications Commission

1. **Enhance Structured Training Programs**

   Although on-the-job training is valuable, a more structured orientation and training schedule for SIWES students would improve learning outcomes. Organized workshops or seminars on key technical topics at the start of the internship can build confidence and preparedness.

2. **Provide Access to Learning Resources**

   Granting interns access to NCC's internal knowledge bases, technical manuals, and online courses would enable self-directed learning and skill enhancement.

3. **Assign Dedicated Mentors**

   Designating experienced staff members as mentors for interns can facilitate guidance, feedback, and support. Mentorship programs foster better integration into the team and improve professional development.

4. **Encourage Cross-Departmental Exposure**

   Allowing interns to rotate through different departments within NCC would broaden their understanding of the organization and provide diverse skill sets.

5. **Regular Performance Reviews**

   Conducting periodic reviews to assess intern progress and address any difficulties can help keep the internship on track and ensure objectives are met.

6. **Facilitate Networking Opportunities**

   Organizing events where interns can interact with professionals in the industry can build valuable connections and motivate students toward their career goals.

General Recommendations

- **Integration of SIWES into Academic Curriculum**

  Educational institutions should continue strengthening the link between SIWES

placements and academic learning by incorporating reflective assessments and practical projects based on the internship experience.

- **Promotion of Industry-Academia Collaboration**
  Encouraging partnerships between universities and regulatory bodies like NCC can ensure that SIWES programs remain relevant and that curricula adapt to industry needs

In conclusion, the SIWES program is an indispensable platform for practical learning and professional development. With continuous improvements based on feedback from students and host organizations, it can effectively prepare graduates to meet the challenges of the modern workplace and contribute meaningfully to Nigeria's development.