**MAKERERE UNIVERSITY**

COLLEGE OF COMPUTING AND INFORMATION SCIENCES

SCHOOL OF COMPUTIG AAD INFORMATICS TECHNOLOGY

A REPORT ON

FIELD ATTACHMENT/INTERNSHIP AT

NCR/SCI

4th JUNE TO 24th JULY 2018

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16/U/2673/PS

Field attachment Report submitted to school of computing and Informatics Technology or

College of Computing and Information Sciences.

In Partial fulfilment of the requirements for the degree of Bachelor of Science In Computer Science of Makerere University Kampala

ABILA RAHAEL

Signature ………………………..

**Field Supervisor.**

**Mr. Miiro William**

**Signature.** ……………………………… **Stamp & Date** …………………

**Academic supervisor.**

**Dr. AGNES NAKAWAWA**

**Signature.** ……………………………….. **Stamp & Date** …………………………

**DECLARATION**

I **ABILA RAPHAEL** declare that this field attachment report is my original piece of work and has never been submitted in any institution of higher learning for any academic award.

Signature …………………………… Date…../……/……

**ACKNOLEDGEMENT**

I thank God for the wisdom, strength, will and courage to carry out this training though many hindrances passed through.

I thank all my supervisors for the advice, courage and guidance they availed me during this training mostly **Dr. NAKAWAWA AGNES** and **Eng. MIIRO WILLIAM** who have provided me plenty during this training.

I would like to thank all the management of **NCR** to accept my request to take u my industrial training with Service and computer industries (U) for all of the prescribed period of internship.

I would like to thank my field supervisor Mr. Miiro William and other **SCI** technicians Mr. Isiah, for their attention, support and their willing to answer all the questions I asked them to make sure that I learn lots.

I also thank my family for the support they upheld to me from the start till completion and financial support as well.

Lastly, I thank all my fellow **colleagues** for all help you have provided amongst us that we complete this task, may **God** guide you in all.

**ABSTRACT**

This is the report about the industrial trainingI carried out at NCR/ Service and Computer Industries (U) Limited between **4th JUNE to 24th JULY 2018**. It is an expectation of the Department of Computer Science that students pursuing a degree in computer science must undergo this training aimed at gaining hands-on skills and experience before completing studies at the University. This report gives an overview of the benefits I fetched from training, the background of the organization, vision and mission of the organization, challenges faced, purpose of the training and the objectives of the organization to mention but a few.

At the training field, I was trained in various fields like **CSD (Customer Service Department)** Computer repair and maintenance, Infrastructure, **and UPS** in **CSD**, **Cabling** and **Networking** in **CSD** and **Software installation** among others.

In the field we carried out repair on different devices like laptops, desktop computers, UPS’s, printer etc. We also set up and configured hardware like personal computers, routers, servers and also configured IP addresses of clients and also installed biometric devices and configured them as well.

Whatever was discussed and covered is well explained and detailed in this report.

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**ABBREVIATIONS**

**NCR:** National Cash Register

**SCI:** Service and Computer Industries

**UPS:** Uninterruptible Power Supply

**ICs:** Integrated Circuits

**UTP**: Unshielded Twisted Pair Cable

**OS:** Operating System

**PM:** Preventive Maintenance

**VGA:** Video Graphic Array

**RAM:** Random Access Memory

**USB:** Universal Serial Bus

**PCI:** Peripheral Component Interconnect

**DC:** Direct Current

**AC:** Alternating Current

**HDD:** Hard Disk Drive

**NTFS:** New Technology File System

**FAT:** File Allocated Table

**SATA**: Serial Advanced Technology Advancement

**VGA**: Video Graphics Array

**PCI**: Peripheral Component Interface

CHAPTER ONE

**1.1 BACKGROUND**

**1.2 INTRODUCTION**

This chapter gives an overview of the historical background of the field attachment / organization and covers all information about the organization of field attachment by insinuating its background, vision and mission statements of the organization, objectives and organizational structure.

**1.3 BACKGROUND OF FIELD ATTACHMENT**

Field attachment is a practical work exercised by staff and students with the purpose of teaching or currying out research outside the institute control but responsible for their staff/supervisors, students and whatever is used during the activity. Students experience the real life of work such that they relate their theory to practical/actual work structures thus find their capability.

**1.4 BACKGROUND OF THE COMPANY**

Service & Computer Industries (SCI) was established in 1962, and in 1989, it took over the operations of National Cash Register (NCR) in Uganda and emerged as the sole representative of NCR solutions. Service and Computer industries is often referred to as NCR, owing to the commitment and dedication with which it has continued to represent the NCR range of products.

NCR is the sole distributor of NCR ATMs, D- Link, Angelico, and EATON Power ware, Systemax, Avanza, EDS and Cyber net in Uganda.

Having strategic alliances with DELL as the master distributor, Cisco as premier partner, Microsoft as certified partner, Olivetti, Zebra, Tally Genicom and Hewlett Packard has ensured NCR remains at the fore front of its services to its customers. These alliances ensure that strong international support network backs the solutions they provide. They are also recognized as the largest DELL representatives in Uganda.

SCI Limited has a support system that consists of over 200 engineers In 5 counties which include Uganda, Rwanda, Kenya, Burundi and South Sudan trained by the very best in their fields and also five service centers spread across Uganda to ensure quick response.

Quality, integrity are reliability are very key when it comes to the NCR family. The company attained its ISO9000 certificate in the year 2001.

Customer- focused and employee- centered values form the rich heritage of NCR offerings backed by an efficient and trained support department that covers a span of solutions such as self- service and payment, Enterprise solutions, Personal Computing, Network Structure, Retail Solutions, Security Solutions, Imaging, Power solutions and Support solutions

**1.5 COMPANY ADDRESS**

NCR is located at Plot 94 William Street. Address. P.O Box 2109, Kampala- Uganda.

**Website. http://sciug.com**

**1.6 MISSION**

SCI Uganda Limited is committed to provide the most effective and complete solutions conforming to International Standards in the area of Information technology for organizations and individuals in Eastern Africa. NCR continuously strives to provide Single-Window, Turn-key solutions.

**1.7 VISSION**

To be the undisputed market leader in provision of ICT solutions and services.

**1.8 OBJECTIVES OF NCR**

To continuously improve growth and market share by ensuring customer satisfaction and retention all the time.

To maintain and enhance the company’s image through meeting commitments at all times.

To maintain a high level customer satisfaction.

To improve profits year after year by continuously improving internal functions through automation.

To maintain a motivated workspace, delivering quality service.

To fulfil the obligations to all external stake holders.

**1.9 ORGANIZATIONAL STRUCTURE OF NCR**

**Figure 1: Organizational structure**

**2.0 Chapter Two: Field Attachment Activities**

During my training at NCR, I was given a chance to train from the following sections of the company;

**Customer Service Department (CSD)**: I was trained on issues to do with desktop computers, laptops, and computer peripherals like printers and projector. I was also taught how to trouble shoot, repair and perform preventive maintenances.

· **UPS Department**: I was taught different UPS, how to install and how to carry out preventive maintenance on a UPS and given tips on selecting the right UPS for a given organization.

· **Infrastructure Department**: I was trained on how to terminate various cables, setting up IP Addresses and setting up wireless networks.

· **Enterprise Software Department (ESD)**: I was trained how to install various operating systems and other software, virtualization and configurations of services.

CHAPTER TWO

**2.1 FIELD ATTACHMENT EXPERIENCES**

**2.2 PURPOSE OF THE FIELD ATTACHMENT**

The purpose of field attachment is to enhance student’s experience through hands-on practice and training by the different experienced mentors in different department and sections within the organization of internship. The student obtain experience through different activities carried out in the organization. Here he/she experiences the real life of work in the field. Not only operating on the physical work activities but also must observe other work behaviors such as dressing code, personal behaving, manners, interaction with other workmates and punctuality.

**2.3 Departments worked in and Responsibilities/Tasks performed.**

**2.6 Customer Service Department (CSD).**

CSD manages the calls from customer and make sure that each customer is served appropriately and also assign work to other departments like workshop, UPS and Cabling.

Also make a follow up on the calls to ensure that services are delivered to the desired customer.

**2.7 Workshop**

Repair and maintenance is managed in the workshop. Computers and other electrical appliances are repaired and maintained in the workshop. Faulty Computers, UPS, Printers, Laptops, Scanners, etc. are serviced in the workshop.

All stock out is first checked from the workshop to verify that no machine is faulty or have damage before it’s released out.

Workshop department is also responsible for **preventive maintenance**(**PM**) which is done every **Saturday** outside the industry to different companies.

**2.8 UPS (Uninterruptible Power Supply)**

This department handles power issues and install the UPS’s to maintain power not only in the industry but also in the customer building. They also take repair and maitainence of the UPS’s of the customers. Power issues corrected by UPS’s include black out, surge etc. 6

**2.9 Networking and Cabling.**

This department deals with laying a physical network in block/building before the computer hardware is installed and the logical network. This deals with both wireless and cabled networks.

They also install and configure security biometric devices, ATMs and cameras on a network.

**2.10 Tasks Performed.**

On the first day at Service and Computer Industry I was briefed about the company’s rules and regulations, the dressing code, behaviors and punctuality.

On the first day I had learned about the UPS, how it operates and its purpose.

A UPS (uninterruptible power supply) is a device to provide a continuous supply of power for sensitive electrical equipments like computers. UPS operations normally starts when there is an abnormality in power and the UPS effectively switch on from the utility power to its own power source using batteries.

Figure 3: shows the internal structure of the UPS. 7

I learned about the UPS types namely ENV 50091-3 and IEC62040-3 and these are used to define the UPS topologies which include; Double conversion/online ups, line-interactive, and standby and the methods to measure their performance levels.

**3.0 SOFTWARE INSTALLATION**

While on the training I learned how to install different kinds of softwarei.e. computer software and system software. I learned how to install system software mostly on DELL computers. The software include the operating system i.e. windows7, windows XP and Drivers like sound, display adapters and graphics, network adapters, ATAPI controller etc.

There was the installation of licensed windows7 professional and Drivers on DELL computers and computer applications like Anti-virus for the protection against viruses, Adobe reader and Microsoft office 2007.

Figure 3: Shows process of installation of the operating system.

To install the operating system on a PC you consider the following;

a. Check system requirements

b. Check hardware and software compatibility

c. Determine disk portioning options

d. Choose the appropriate file system if required like FAT, FAT32, NTFS.

e. Decide on a workgroup or Domain installation.

f. Complete a pre-installation checklist.

g. After you made sure you can go on, start the installation process.

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**3.1 HARDWARE DIAGNOSE, ALARM INTERPRETATION AND TROUBLE SHOOTING**

At the training I learned how to diagnose different hardware like hard drive, RAM, cemos, PC mother board among others.

There was troubleshooting and repairing of a call center display device which had failed to power on. It was found that it had got an electric shock and some capacitors were damaged on its power supply board.

Figure 4: Shows the power supply of a call center display device.

There was troubleshooting of a laptop which was producing seven continuous beeps and the repair of the paper shredder which had stopped working.

I learned that different sound beeps vary according to the error of the hardware and how those beeps are interpreted and identifying the errors according to the beeps.

While at Service and Computer Industries I was introduced to printers, how they work and how to troubleshoot them.

**A printer** is a device that accepts text and graphic output from a computer and transfers the information to standard sheet pieces of papers. 9

I was introduced to some parts of the printer which include the following;

a. Fuser unit

b. A power board where the printer gets power

c. Toner cartridge that holds toner for printing.

d. Logic board which interfaces between the computer and printer

e. Scanning unit that scans images and text when printing

f. Paper pick rollers and the fan which cool the printer

I learned two types of printers which are, the impact printers and non-impact printers

Impact printers include the Dot matrix printers, Daisy wheel and Line printers while non-impact printers include Ink jet printers, Thermal printers and Laser jet printers.

**3.2 CABBLING**

This department deals with laying down physical network on a block/ building before the computer hardware is and logical network is installed. In this department they work on both wireless and cabled networks though mostly we focused on cabled network.

Cables work as medium through which information is usually transmitted from one device to another and in most cases the type of cables selected relate to the topology of the network, size and protocol of the network. To develop an outstanding network one must determine the characteristics of different types of cables before deciding which type of cables to use.

To lay a cabled network mostly UTP (cat6) and network cables in a block are used and mounting access points to extend wireless network to the client computers in different locations are required.to form a network in a block, UTP cat6 cables has to terminated and all cables has to pass through different rooms by data points in data sockets for data and voice. Cables were 10

terminated in patch panels in rack cabinets in the server room and from the individual points in the patch panels, connected other cables called patch nodes at opposite sides to switches to allow communication. In the patch panel, cable are connected following the order used at the data points for tidy and effective network.

A patch code is any straight through cable that connects a switch to a patch panel. Fiber optical cables are installed at THETA if the distance to be covered is more than 200m because that can’t be managed by twisted pair or coaxial cables.

I also learned the tools used which include the following;

a. Cable tester for testing cables.

b. Screw driver and screws for tightening sockets

c. Data sockets with modules

d. Strippers

e. Wall plugs

f. Trucking for cable management

g. Patch panel and switches

h. Cable ties

i. Pairs of axel

j. Crimping tool

k. RJ-45 connectors

**3.3 Preventive Maitainence (PM) servicing.**

At Service and Computer Industries I learned to do preventive maintenance. PM help keep machine to operate in good conditions as it controls malfunctions in the near future. PM removes dust and other dirtying stuffs that would cause blockage in the computer and other machines from their operations.

At the training I got chance to do PM service on the UPS at Orient Bank William Street where I went with one of the mentors in the industry to replace the UPS batteries and we serviced the UPS by blowing dust from the UPS and cleaning it inside and outside using Pledge cleaner.

PM Service is done every Saturday of every week to companies that have called for maitainence of their machines. 11

**3.4 HOW THE COURSE UNITS STUDIED WERE APPLIED DURING TRAINING.**

During the training course at Service and Computer Industries, I applied most of the courses I were taught during my study. I was able cooperate with NCR staff by behaviors and in other technical share of skill they posed as well as sharing of views on different subjects that we wouldn’t understand. Good communication skills and managing of emotional intelligent helped perceive much from this training.

I was able to apply most of my theoretical skills grabbed from the institute to different areas of work where they were applicable. Repair and maitainence, Networking, Systems Analysis, and Information Technology among others helped manage this training that I wasn’t green about what to do. This was a hands on training and experiencing real life of work but all were due to the skills I were taught from the institute.

Information Technology helped to understand a computer system, its components and how it works. I was also able identify computer software and system software and their components.

Repair and maitainence drove me in maintain, diagnosing and identifying system faults, hardware and software of different machines.

Networking was applied in the laying of the network and configuring of different devices on the network. Connecting client computers to the server using cables and configure them besides descriptions from other mentors at NCR, I myself had a view on what to do not only in this department but also in others and in all the work I did during the training.

**3.5 MAJOR CHALLENGES FACED DURING THE TRAINING AND HOW WERE HANDLED**

A major challenge was get the placement for internship training but later I was called at Service and Computer Industries (SCI).

Punctuality. Time to arrive at NCR is too early, i.e. before 8am yet I stay quite a long distance but I did my best to cope up and manage time.

Some staff are rude and are not approachable but I managed my emotions and I able to approach them and cooperate with them. 12

Some entries at SCI are biometrically controlled, most staff have pass codes so it was difficult for me to enter some places I was sent in as I would wait for a person with a pass card/code to open for me

SCI works on many machine of which I never heard of, instead I asked my supervisors how to handle them.

At SCI each staff in the Workshop, UPS and Networking must poses his or her own tools to use in the workshop, the company provide a few and for only the authorized ones. I had to buy my tools.

Hunger. At SCI only a few of the staff they provide lunch the rest of the staff have to cater for themselves. It was the same case on me.

Transport during training was so difficult because of traffic jam, it needed me to get up very early in the morning to bypass traffic jam which was hard sometimes.

Confronting and working with a group of people I never meet was really challenging but later after understanding them I was able to cooperate and work with them.

Getting signatures for most supervisors to sign on the daily activity record was very hard, most of them would refuse absolutely and others would just ignore and plead otherwise to take me off topic.

There were some rules in the workshop I did not know of which I would break some of them like eating from the workshop was not allowed which was told me later. 13

**3.6 PERSONAL BENEFITS GAINED FRON THE TRAINING**

**Technical skills.**

In the training I learned how to operate on many different machines like UPS, Computers, and Printers among others. I learnt how to open a computer, printers, UPS and others.

**Troubleshooting skills.**

I learned how to troubleshoot different devices and fixing of solutions, I can troubleshoot devices like computer motherboard, laptops, printer among others.

**Cabling**

I learnt how to set up a physical network and connecting devices like computer, a switch, router and others.

**Networking**

I learned how to configure network devices on a network. I can configure devices like a server, a switch, a router, a phone among others and finding their IP addresses.

**Working behaviors**

Also I learned how to behave and cooperate with other fellow workers in a company/organization by understanding how to behave and following the company rules besides the dressing code according to the company or organization.

**Software installation and management.**

I learned how to install different kinds of software and their driver pack solutions. Software like Windows 7, Windows XP, Microsoft office 2007 among others. Divers like Sound, Graphics, Network controllers, PCI among others.

**Punctuality**

I learned to keep time and manage it as the company requires to every worker. 14

**Maitainence**

I learned how to do preventive maitainence on different machines and what to use during maitainence. Like soft boards, pledge cleaner, etc.

**3.7 RECOMMENDATIONS**

**3.8 Recommendation for improvement in the organization of internship training.**

Service and Computer Industries offer the best knowledge and technical training and skill to most of the students around Kampala. SCI’s work is so practical than theoretical that makes it better for students who are looking for where to obtain such skills.

NCR wishes to widen customer service atmosphere that engulfs almost most of the companies around Kampala that makes it employ the most competent technicians thus offers the best technical IT skills.

NCR wishes to extend its partnership with other IT companies that will help improve in technology and the use of other new devices and how they operate.

NCR wishes to advance its departments to manage software and programing applications that will help students get more skills in software development.

**3.9 Recommendation for improvement for future industrial training by YMCA.**

The institute should not stop this program, should continue sending student to undertake this practical course because it help students change minds from theoretical to hands-on practical work.

YMCA should study the period of internship from different companies/organizations before sending student for training.

YMCA should propose for their students to be given transport allowance during the training and lunch for effective working strategy. 15

**4.0 CONCLUSSION.**

The period I spent at Service and Computer Industries I learned more about different kinds of computers, laptops, UPS, printers, servers, cables, scanners, routers, switches and many other devices, how they work, troubleshoot them, maintain them and fix problems. And I have been exposed to different interfaces of software and how to use them really I appreciate NCR and my institute for that opportunity and time which was so valuable for my academic integration.

I learned how to install different types of software and how to use them on different machines.

In the training period I took at SCI gave me confidence and experience as a real staff that helped me gain skills from different departments and ask questions where I didn’t understand.

The interaction with the experienced NCR staff helped to understand the aims and objectives of the industrial training and I embrace its continuity.

**4.1 Reference**

· www.dellcompany.com

· http://sciug.com

· NCR staff.

**PREVENTIVE MAINTENANCE (PM)**

Preventive maintenance refers to wiping and blowing dust from electronic devices i.e. PCs, Printers, Scanners, ATMs, UPS, Laptops, Projectors and server and ensuring a normal computing environment which may have effects such as holding heat, humidity which is horrific and awful for electronics, For PCs, PM goes beyond the hardware cleaning ie it also involves software clean up like deleting temporary files, performing disk clean up.

The company usually carries out preventative maintenance every Saturday for the customers who confirm and make orders. Clients are always advised to carry out a PM service frequently in a period of three to four months (3 – 4 months). During the training I went for several preventative maintenance activities like at Standard chartered Kireka, KPMG, ICEA and we were able to use a variety of equipment when carrying out the PM services;

* A blower to thoroughly blow all the dust from the machine. One has to be careful when using blower because there are parts that are not blown directly like the system fans, processor and boards which are to blown from a distance.
* A detergent like pledge or vim poured on a clean and dry piece of cloth to whip the machine to remove dirt. Vim is usually used to scrub white surfaces while pledge is used on sticky materials on surfaces.
* Screw drivers to open up the machine so as to clean some of the inner components that the blower can’t reach.
* Gloves can also be used for protection from really dirty surfaces.
* Towels , these are of two different types , one is rough and is used for scrubbing surfaces after applying a detergent like pledge but it usually leaves small particles after cleaning and the other smoother towel is used to wipe away all those particles to make the surfaces look neat.

Below are some of the equipment used during a PM service.

**Pledge**  **Towel**



 

**Blower shinex**

**STEPS TO CARRY OUT A PREVENTIVE MAINTENANCE SERVICE**.

* Test the device: This is the initial step to carrying out a PM where an engineer should ensure that he knows the state of the machine he is working on and if possible, one should have evidence like photos of the machine state, this prevents false claims by the client after working on their machines.
* Turn off the machine.
* Wait for the machine to cool.
* Connect the blower to power.
* Blow out all the dust through all the holes or openings on the device like monitors, PC.
* Do thorough cleaning of the machine using detergents, hard brush and towels.
* Reconnect the machine how you found it and restart.
* Perform a software Test

-Run system diagnostics using the F12 and F5 for DELL machines.

-Reboot the machine back to Windows.

-Ask for password if any and perform a Disk clean up by typing ‘cleanmgr’ and ‘%temp%’ to clear temporary files after defragmentation.

* After all this is done, hand over the machine to the client.