**THE UNIVERSITY OF DODOMA**

**THE COLLEGE OF INFORMATICS AND VIRTUAL EDUCATION**

**DEPARTMENT OF**: COMPUTER SCIENCE AND ENGINEERING

INDUSTRIAL TRAINING REPORT

**At the Department of** ICT

TANZANIA PORTS AUTHORITY(TPA)

TANGA.

**By**

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2022/2023

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## LIST OF ABBREVIATIONS

TPA: Tanzania Ports Authority

ICT: Information Communication Technology

UPS: Uninterruptible Power Supply

UTP: Unshielded Twisted Pair

CPU: Central Processing Unit

RAM: Random Access Memory

IPT: Industrial Practical Training

CIVE: College of Informatics and Virtual Education

BSc-CE: Bachelor of Science in Computer Engineering

## ACKNOWLEDGEMENT

First of all, thanks to our almighty LORD for giving me good health and ability to complete my Industrial Practical Training. Also, thanks to my parents for giving me encouragement, enthusiasm and invaluable assistance to me. Without this all, I might not be able to complete this training properly.

Secondly, I would like to thank University of Dodoma for giving us the opportunity to undergo practical training outside the campus so as to be familiar with what we have being learning at the class.

Thirdly, I also want to express my deepest thanks to JOHANNES RWEZAULA who gave me the guidance, support during the training and helped me a lot in dealing with industrial training placement.

Besides I would also like to thank to my supervisors/training officers at TPA, ALLY ISSAKA and MR. GASPAR MATOKE for helping us with the training and gave us right direction towards completion of our different works on IT aspects. A paper is not enough to express the support and guidance I received from them almost for all work I did there.

Furthermore, special thanks to all ICT staff members at Tanga port for being with us from the beginning to the completion of our practical training, May all be blessed for their support.

## ABSTRACT

This Industrial Practical Training report for two months duration starting from July31, 2023 to September 22, 2023 at Tanzania Ports Authority (TPA).

The purpose of this training is to get work experience that is relevant to the ICT aspects. During this

I learnt a lot of things that I never knew before. The training sharpened my knowledge in a way to perform other works after completion of the training.

During the time, large number of student doing training lead to division of work together with shifts to accommodate all students, but we finally learnt and gained a lot according to our duties assigned.

## SUMMARY

This report includes summary of all activities or tasks that have been done during the industrial training schedule at Tanzania Ports Authority at the department of ICT. Shortly, the report reflects all what have been done during the whole practical training conducted for two months from July31, 2023 to September22, 2023.

My report has two parts, the part is computer hardware and maintenance such as troubleshooting and repairing of computer and computer networking such as internet connections, network configurations and local area network troubleshooting, and at the last part is conclusion and recommendations of what was done during the industrial training

## 1.1. INTRODUCTION

I completed my industrial practical training at Tanzania Ports Authority at Tanga port that begun from 31st July, 2023 to 22nd September 2023. For which I have been trained to analyze both hardware and software computer maintenance as well as networking.

In computer hardware and software maintenance some of the works are assembling and dissembling of computers, Repair of different computers and printers, computer troubleshooting and maintenance. Also, installation of windows operating system and other computer application that are used in that organization such as SAP.

Most of the work performed in computer networking are network installation, fixing of telephone system, network cabling and wireless networking, configuration of different networking devices, troubleshooting of LAN (Local Area Network), creating cable especially UTP cable.

Besides that, we manage to use some computer machines well, being careful working with machines was more important to avoid deletion of data in the machines.

## 2.1 Company History

The Tanzania Ports Authority (TPA) was established by the Ports Act No. 17 of 2004 as landlord authority. It operates a system of ports serving the Tanzania hinterland and the landlocked countries of Malawi, Zambia, Democratic Republic Of Congo, Burundi, Rwanda and Uganda.

TPA currently performs the role of both a Landlord and Operator with the main function of promoting the use, development and management of ports and their hinterlands, entering into contracts for the purpose of delegating the powers of the Authority (through licensing and concessioning ports services)

TPA administers a diverse system of Tanzania's mainland seas and inland water ways (Lake Ports). The major sea port are Dar es Salaam, Tanga and Mtwara while smaller seas ports are Kilwa, Lindi, Mafia, Pangani and Bagamoyo. The lake ports under TPA mandate are: on Lake Victoria include Mwanza North and South Ports, Nansio, Kemondo Bay, Bukoba and Musoma: on Lake Tanganyika, are Kigoma and Kasanga: and on Lake Nyasa are Itungi Port, Kiwira, Manda Liuli and Mbamba Bay.

## 2.2 Mission and Vision

**Mission**

To develop and manage ports that provide world class Maritime Services and promote excelling total logistics services in Eastern Central and Southern Africa.

**Vision**

To lead the regional maritime trade and logistics services to excellence.

*Figure 1 Tanzania Ports Authority Logo*

## 3.0 COMPUTER NETWORKING

Computer networking refers to connected computing devices (such as laptops, desktop, servers, smartphones, and tablets) and an ever-expanding array of IoT devices (such as cameras, door locks, doorbells, and various sensors).

Modern day networks deliver more than connectivity. Organizations are embarking on transforming themselves digitally their network are critical to their success. The type of network architecture that are evolving to meet these needs that are mostly used at Tanzania Ports Authority (TPA) is Multidomain Integration: Larger enterprises may construct separate networks, also called networking domains, for their offices, WANs, and data centers. These networks communicate with one another through their controllers. At TPA they have two domains Old domain and new domain with their Administrator.

There are three types of networks that fulfill different purposes:

- Local area network (LAN): Can be small or large, ranging from home network with one user to a large enterprise network with thousands of users and devices. A LAN may include both wired and wireless devices. Regardless of size, a LAN particular characteristic is that it connects devices that are in a single limited area.
- Wide Area Network (WAN): Large organizations use WANs to connect their various sites, remote employees, suppliers, and data centers so they can run applications and access necessary data. Physical connectivity in WANs can be achieved by leased lines, cellular connections, satellite links, and other means.
- Enterprise Network: A network built for a large organization, typically called an enterprise, needs to fulfill exacting requirements. These networks have tools that enable network engineers and operators to design, deploy, debug, and remediate them.

## 3.1 NETWORK INSTALLATION, WIRELESS NETWORKING AND CABLING

**Network installation** provide IT support and installation for voice, data, video, and wireless solutions. Also, we install standard office drops, remote locations connected by direct fiber, as well as wireless connectivity from building to building. Then for our network configuration include router installation, wireless routing and firewall configuration. Therefore, network installation can serve as the link to your telecom for ensuring the best pricing for the company.

**Wireless Network:** Allows devices to stay connected to the network but roam untethered to any wires. Access points amplify Wi-Fi signals, so a device can still be connected to the Wi-Fi. Also, there are several types of wireless communication system:

- Wireless Local Area Network (WLAN): Wireless Local Area Network (Wi-Fi) is an internet elated wireless services. Using this Wi-Fi, different devices like laptops and mobile phones can connect to access point and access internet.
- Infrared communication: Used wireless in daily lives. It uses the infrared waves of the Electromagnetic (EM) spectrum. Used in remote controls of Cars, Television and others.
- Global Positioning System (GPS): GPS is a subcategory of satellite. It provides different wireless services such as location, positioning, speed and location.

**Network cable** are networking hardware used to connect one network device to other network devices or to connect two or more computers to share printers and scanners. Also, these cables are carrier or a media that data flows on it. There are different types of cables and their appropriate type to use depends on the topology of the overall architecture of the system. There are types of cables such as coaxial cable, twisted pair, multipair cable and other types of media called wireless, otherwise referred to as Wi-Fi.

*Figure 2 Network Cabinet*

## 3.2 HOTSPOT CONFIGURATION AND INTERNET ACCESS

Hotspot configuration is the step that taken to ensure that the certain organization there is the wireless internet service so that every computer or printer can access the internet. Internet access is the ability of an individual and organization to connect to the internet using computer, computer terminals and other devices, and to access services like email and World Wide Web.

In order for the user to easily access the internet and hotspot network he/she must take into consideration that the devices

- Security
- Cost
- Availability

## 3.3 MAKING THE NETWORK CABLE

There are two kinds of Ethernet cable, that are crossover and straight through cable.

- Ethernet Crossover cables: Used to connect computing devices together directly. It is used to connect two similar devices together such as two computers or two switches.
- Straight through Ethernet cables: Is used as a patch cord in Ethernet connections.

  All cables are straight through if you insert a network device between two devices of the same kind.

Steps to follow on how to make ethernet cable:

1. Carefully remove the outer jacket by using the blades on the crimping tools about (1 inch) as shown below


*Figure 3 Step 1 while removing the outer jacket*

2. Unwind the wires so that they can lay on your fingers and pair the similar colors.
3. Straighten them out as shown in the figure 3 and the color code like (white orange, orange, white green, blue, white blue, green, white brown, brown from left to right.) is important to get correct.

*Figure 4 Straighten the wires*

4. Cut the wires in good order to make it straight cut across eight wires 1.3 cm from the cut jacket to the end of wires.
5. Then push all the 8 wires on the connector and make sure no any short wires.

6. Carefully place the connector on the crimper and handle it tightly.

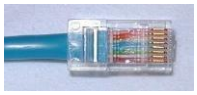

*Figure 5 Cable after been crimped*

7. Finally, repeat the same procedure regarding to your specifications.

Tools used in making of the ethernet cable.

- Unshielded twisted pair(UTP) patch cables
- Crimping tool, this is the special device used to attach a connector to end of network cable.
- Cable tester, this is an electronics device used to verify electrical connections in a cable or a wired assembly.
- Modular connectors aka RJ-45 cable, this is the connector used for Ethernet connections on computer and other Ethernet networking devices like routers, switches, modems.

*Figure 6 CAT-6 cable*

*Figure 7 RJ-45 connectors*

## 4.0 COMPUTER HARDWARE AND MAINTAINANCE

Maintenance of computer is taking rid of physical components of computer such as its memory, monitor, CPU and internal parts drives. Make sure computer is clean, keeping its

fans free from dust (Also by keep on checking its CPU), and defragmenting its hard drives regularly are all ways of a computer hardware maintenance program to deal with it.

Computer maintenance always help to avoid tear and shear in computer, also helps to extend the lifespan of computer. Not only helps its system to work properly but also to work very fast.

Maintenance of computer also avoid some of the data in computer to get lost since when the IT fix it so as to help user use it without any trouble.

During the practical training I get the idea to fix a computer that has problem on its RAM, hard drive didn't work properly also changing the UPS battery and put the better one.

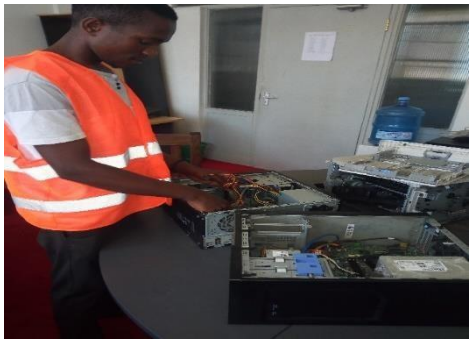

*Figure 8 Computer troubleshooting, maintenance and repair*

## 4.1 REPAIRING OF DIFFERENT COMPUTERS AND PRINTERS.

The process of correcting, fixing or replacing computer components to make it function properly. When a computer or a computer component malfunctions, it needs to be repaired. During the practical training we fix and troubleshoot the computer that has problems on its CPU, RAM and other components on its motherboard. Also, printers that has problem such as connect it with internet or enable sharing of printers. Some of the tools used to repair a computer and printer are:

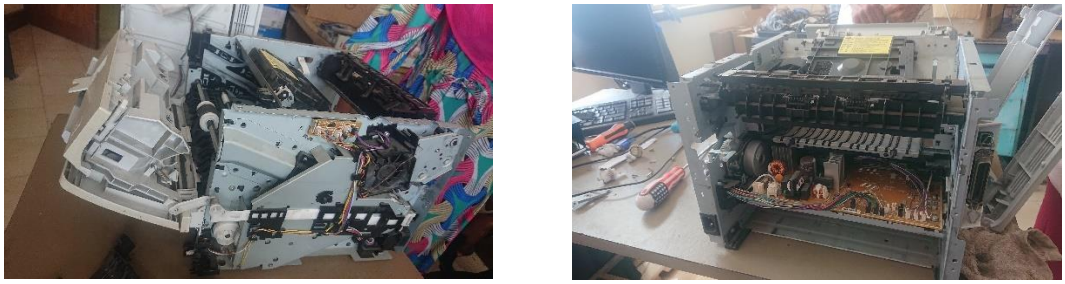

*Figure 9 Printer troubleshooting, maintenance and repair.*

- Computer blower machine: Has very strong air pressure engine inside for flowing off the dust and effectively cleaning your machine for maintaining quality and long life of your machine.

*Figure 10 Leaf blower*

- Tool kit: Means the set of all the components or tools used in repair and computer maintenance

*Figure 11 Tool kit*

- Digital Multimeter: Is an electronic component used to measure voltage, current and resistance.

*Figure 12 Digital Multimeter*

## 4.2 COMPUTER TROUBLESHOOTING

Troubleshooting is the process of detecting, isolating and repairing fault in a given system. In troubleshooting understanding behavior of each of the component that is made up a computer is necessary. In troubleshooting methods are swapping and eliminating.

The basic process of troubleshooting is to check the most general possible problems first, and then gradually check for more specific problems.

Troubleshooting involves

- Identification of the problem
- Examine possible causes
- Suggesting possible solutions

When dealing with troubleshooting, do not start with statements like?

- Replace with...
- Buy a new one...
- Reinstall

## 4.3 HOW TO IMPROVE COMPUTER PERFORMANCE.

Below are the ways of improving computer performance.

- Limit startup tasks and programs.
- Use disk cleanup and disk defragmentation software.
- Reinstall your Operating System.
- Upgrade RAM to your PC.
- Uninstall unused apps.
- Take a look at your web browser.

## CONCLUSION

By getting experience on Industrial Practical Training a lot of knowledge and experience were gained and built.

Moreover, practical training should be provided frequently at college for student to be competent in ICT fields. This also help student to be competent on working in an organization.

Also, practical training is very important because it imports the knowledge on different areas as for environmental concern. It also activate the interest on different areas of science and technology particularly when we come to realize the applications of theories taught at class.

Also, I recommend adding the IPT time so that the students can explore more ideas and interact with the work field more and more.

Finally, during industrial practical training helps the student to interact with students from different universities and get to know each other and share some ideas and experiences in ICT fields.

## REFERENCE

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Lammle, T. (n.d.). *CCNA TM Certified Network Association,5th edition.*

Logbook

## APPENDIX

- Logbook
- Arrival Notes
- Supervisors Assessment Form