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SCHOOL OF ICT

DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR: 2021 – 2022

YEAR OF STUDY: III

NYARUGENGE CAMPUS

DATE: 17th March 2023

Industrial training report

# DECLARATION

I, BIGANIROOlivierstudent of University of Rwanda/College of Science and Technology (CST) with registration number 220013881, hereby declare that this industrial attachment report conducted at NYAMAGABE District office Department of IT from 9th January 2023 to 17th March2023 is authentic and has never been presented before anywhere else for any academic qualifications, in any university or in any institution of higher learning.

**Declared by: Supervised by:**

**MUKAYIGIRE Berthe NSANZIMANA Eric Thomas**

**The report’s owner NYAMAGABE DISTRICT**

**Date: ……../……./……… Date: ……../……./………**

**Signature …………………… Signature ……………………**

# ABSTRACT

In generally, University of Rwanda, college of science and technology**,** year three students are required to undertake industrial training in their field for 10 weeks from 9th January 2023 to 17th March 2023. Industrial attachment has become a primary supporting pillar for me and other students who seek for transformation from theoretical skills into practical skills in one way or others.

The academic internship helps students to put in practice what I learnt in class theoretically in their all studying period.

I was carried out in Nyamagabe District where got sufficient knowledge and skills that are required to the different services wanted by people in field of information and communication technology like computer maintenance, network setup and installation especial internet technology, software and website development and other general study skills.

Before my journey of internship started, I was curious to know how to perform different activities in my field like how to disassembly and assembly laptop computer, installation of organization network and understanding well internet technologies, to know the basic characteristics of business website and other software commonly needed and trending in ICT market environment.

I would like to mention experience that are obtained from the industrial attachment, where team work, discipline and collaboration is the key to success as the future engineer aiming hands on skills.

# LIST OF ABLEVIATIONS

ICT: Information Communication and Technology

IT: Information Technology

LAN: Local Area Network

VLAN: Virtual Local Area Network

VPN: Virtual Private Network

DHCP: Dynamic Host Control Protocol

NAT: Network Address Translations

STP: Shielded Twisted Pair

ISP: Internet Service Provider

TPC: Twisted Pair cable

RAM: Random Access Memory

HML: Hypertext markup language

CSS: Cascading Stylesheet

IP: Internet Protocol

CU: Control Unit

PC: Personal Computer

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# **CHAPTER ONE: DESCRIPTION OF NYAMAGABE DISTRICT**

## **Location and a brief history of the establishment**

Situated in the South-West of the Southern Province, the District of Nyamagabe is one of the 8 Districts comprising the Southern Province. It is surrounded by the Districts of Karongi and Ruhango in the North, Nyanza and Huye inthe East, Nyaruguru in the South, Rusizi and Nyamasheke on the West. Nyamagabe District has 1090 Km2 subdivided into 17 administrative Sectors, 92 Cells and 536 Villages (Imidugudu).

## **Information, Communication Technology (ICT) background.**

Telecommunication is facilitated by MTN, Airtel and Tigo Networks. Around 2.8% of district households use TV, 54.8% use radios, 2.8 use DVD/Video player while 46.6% use mobile phones. The ownership of computers is 1.1% and the rate of internet usage is 2.8%. (EICV4). Computer literacy rate, which is 4.2%, has generally risen compared to previous rate where it was at 1.9 % in EICV3.

## **Role of ICT in the organization**

ICT has more role in NYAMAGABE DISTRICT where it can play a critical role in improving quick services for individuals and communities. By providing new and more efficient ways of accessing, communicating, and storing information with the help of computerized system where data stored are secured and accessible easily.

Further, with the development of databases and similar applications, ICT has the potential to improve government system efficiencies and thus prevent political decision making error.

Not only that but also ICT helps in communication by providing and controlling well network uses in Organization and that also helps in making research of different thing about proper way of using government system or other administration service.

**CHAPTER II. ATTACHMENT EXPERIENCES**

## **2.1. Objectives of internship**

### 2.1.1 Main objectives.

The main objective is to put in practice, theoretical knowledge acquired during coursework and be able to contribute technically and solve some problems faced in field of information and communication technology.

### 2.1.2 Specific objectives.

* Assess interests and abilities in my field of study.
* Learn to appreciate work and its function in the economy and general society.
* Develop communication, interpersonal and other critical skills in the job interview process.
* Build a record of work experience.
* Acquire employment contacts leading directly to a full-time job following graduation from college.
* Explore career alternatives prior to graduation.

## **2.2. Overview of internship experience**

### 2.2.1 Computer hardware and maintenance

First, I was able to disassembly and assembly laptop especially POSTIVO BGH, Hp Probook 4530s, Compaq 610. Due to daily activity done, the most of computer require regular maintenance in order to maintain proper working. In this case first thing we took care was computer hardware maintenance software installation, by here we cared about repairing computer hardware by cleaning it and replacing some components where need upgrading and maintain them in proper operation. I have again formatting and installation of window 10 operating system and essential application software.

Figure Postivo BGH Repair

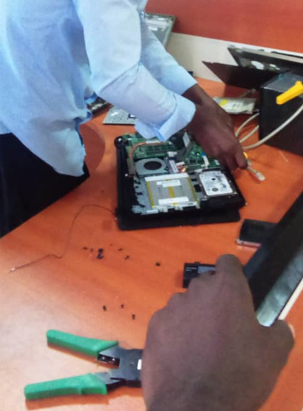


Figure ProBook 4530s repair



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### 2.2.2. Experienced problem.

During my internship I met with different maintenance problems and I was able to solve them first with my supervisor and after I can be able to solve myself.

**First problem:** computer that switched on but not showing anything on screen while the power button is showing that it is on.

* **Solution:** opening that computer (control unit) then remove RAM and CMOS battery for minute then close CU and switch on again, that may be caused by power loss for several times.

**Second problem:** there is also a problem of computer which run slowly and producing more noise.

* **Solutions:** That computer may have many heavy unusual installed software, so the most solution is to many backup of needed data so as to install new operating system again and most useful software.

is not only problem above there is other like replacing broken screen etc.

### 2.2.3 webapplication and software development.

About webapplication there is task given by superviovor whe we design web based site used by internet user to search district services , time devilvered and contact per each services. To design this website use django framework, python for backend, html, css and javascript for frontend, github and versel for deployment.

Figure About district page

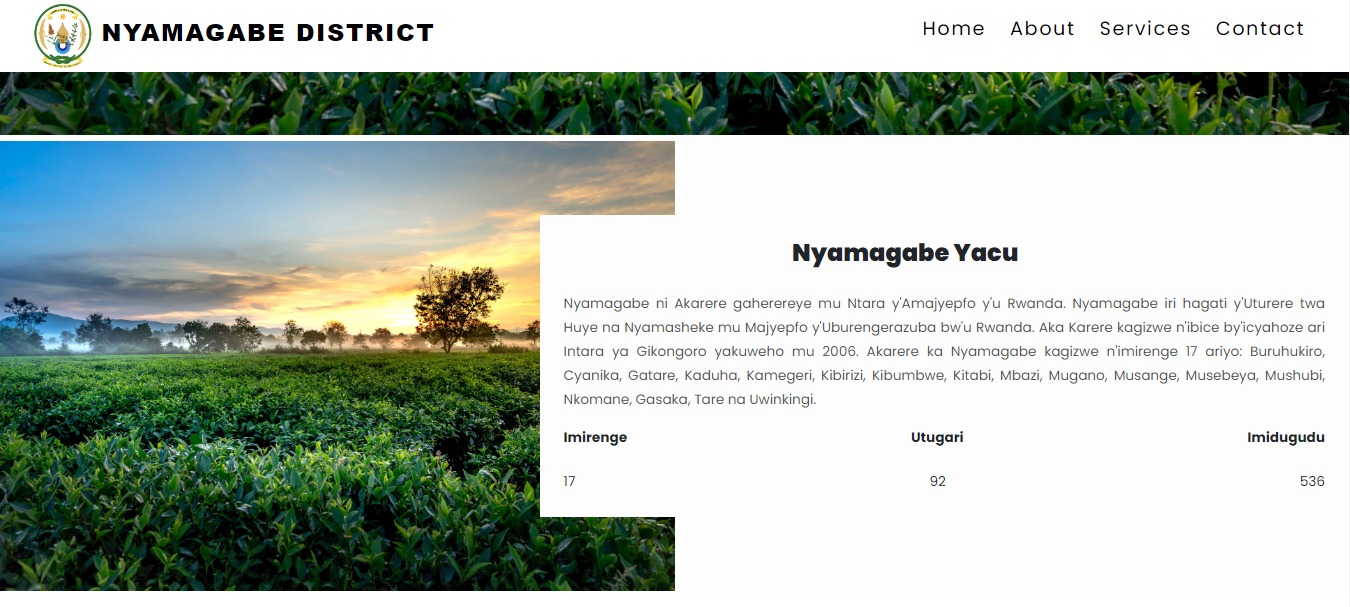


Figure Home page



Figure Contact district page

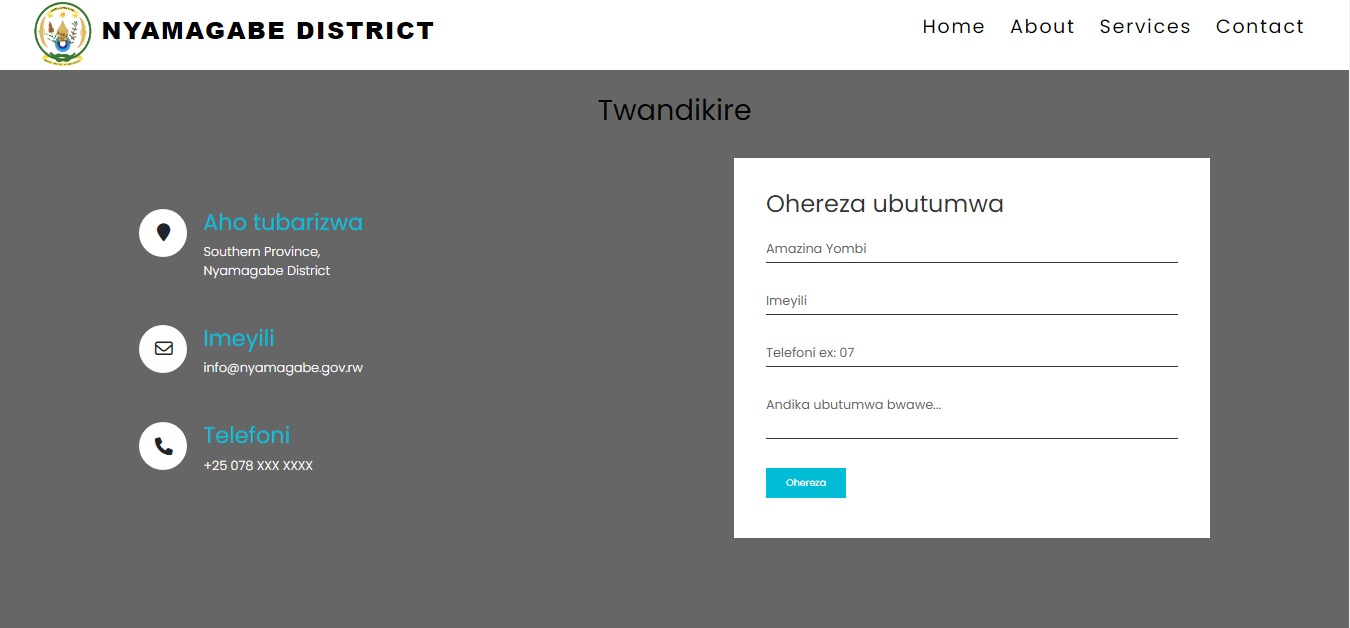


Figure Services page

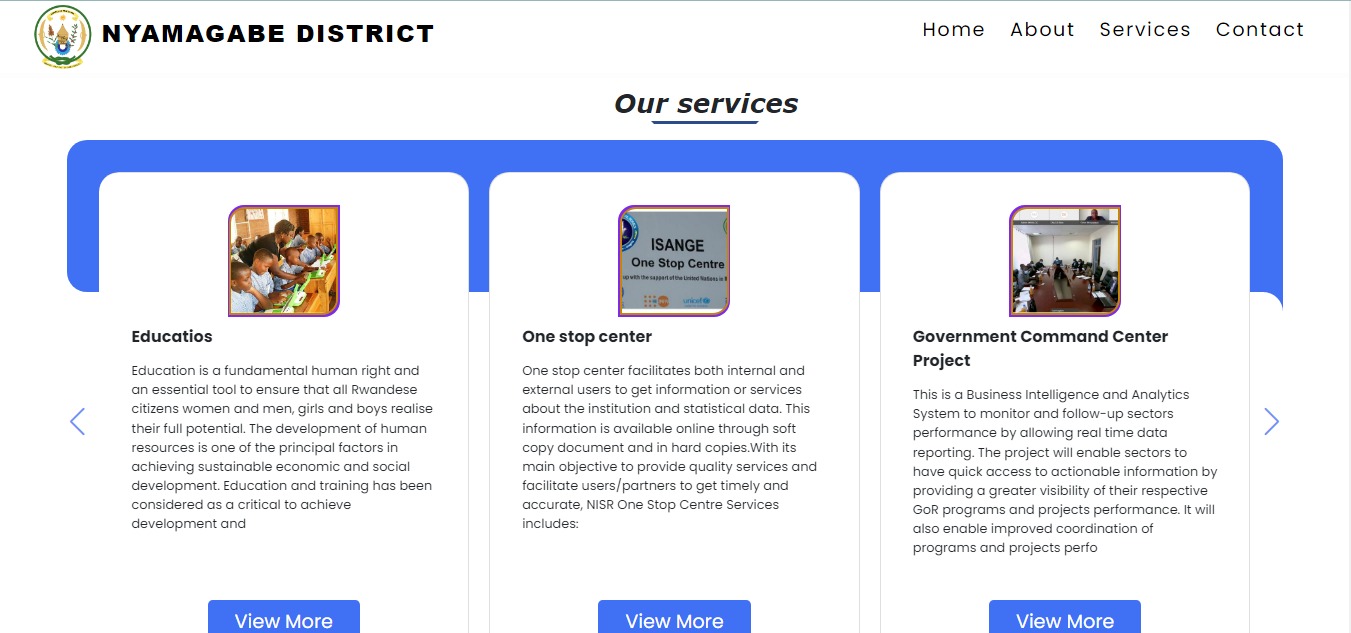


Figure Footer

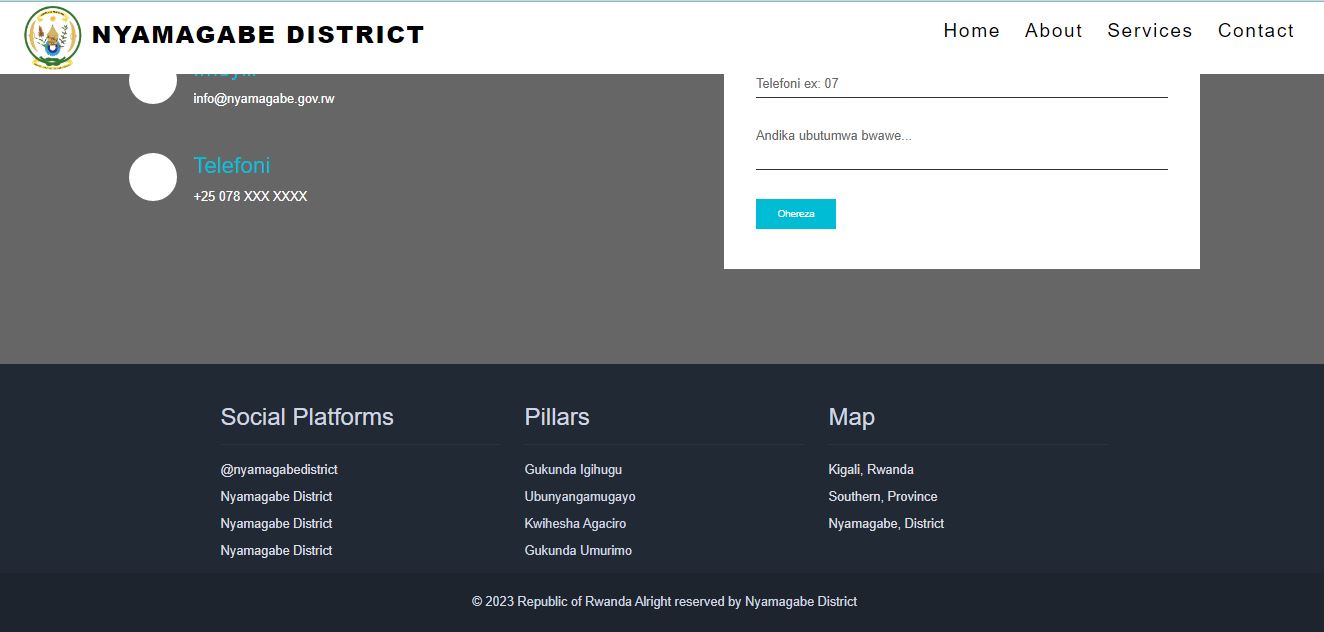


Figure view detail



### 2.2.4 Networking

#### **2.2.4.1 Cabling**

In networking I was able to understand and develop LAN. I was active to solve same network problem happened in organization’s physical LAN network like to making network cables especial straight through and crossover cables, install and configure access point, and try to fix internet problem raised when computers were connected on network.





Figure Test cable by Cable Tester

Figure Untwist TPC and tight Rj-45

#### **2.2.4.2 Network configuration.**

##### **2.2.4.2.1 VLAN configuration.**

On side of VLAN (Virtual Local Area Network). We know that one port on router equal to one network, in contrast we can take one port on router and divide virtual network on switch and assign each port on created virtual network and also take one port as trunk root to all virtual network so to be commutated each other. VLAN is commonly used because has a flexible networking model that groups users depending on their departments instead of network location.

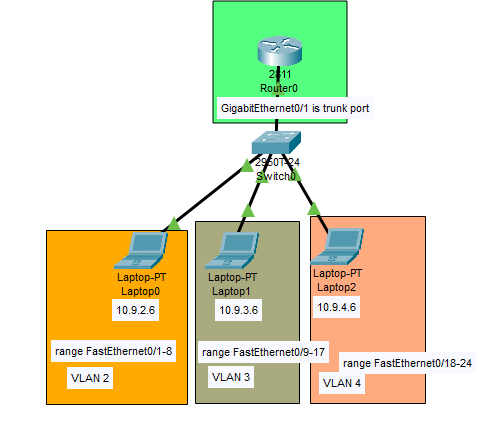


Figure VLAN (Virtual Local Area Network)

##### **2.2.4.2.2 DHCP on router configuration and install network of large company’s building.**

In general, we need DHCP (Dynamic Host Control Protocol) server on router due to every host need to get IP address automatically.

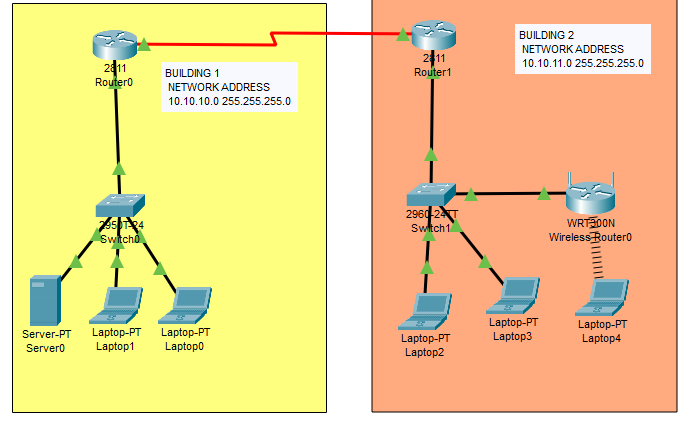


Figure Extended LAN (Local Area Network) in two building

**2.2.3.2.3 NAT and DHCP on router configuration**

On other hand I was design and implement other logical network like VLAN, VPN. I am able to configure NAT and DHCP on router, VLAN and HHCP server on switch using packet tracer. About NAT configurations is because Private network like LAN have many IP address but need to access on public network like WAN using one ISP (Network Service Provider) IP address called public IP address.

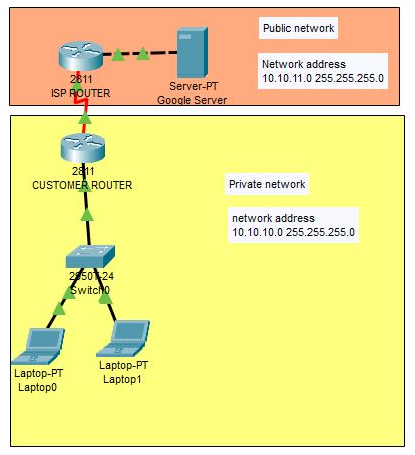


Figure Config access to ISP(Internet service provider) router port

### 2.2.5 OTHER KNOWLEDGE AND BENEFITS I GAINED FROM INTERNSHIP

Apart from experience gained from my supervisor’s task, I have gained other skills and advantages from my internship organization. same are followings:

First one, Internship was often tied closely with full-time employment, so it gives me a chance to see how people work together daily, which can be incredibly beneficial when I will be applying for jobs after graduation.

Second, Internship can provide valuable hands-on experience in an organization that a I may not have had much exposure to before starting studies. In addition, this gives me insight into what it's like being employed by certain organizations or working with specific types of people within those organizations, which can help me prepare for future careers.

Other positive side, my time of studying, it's hard to get feedback on my work. but, Internship was help me to get quality feedback on my work from people who know what am I doing. it also gives me insight into how to improve my skills and knowledge so that I can work in the information technology field after graduation.

Last one, Internships was also a great way to meet new people, especially if I will be looking for a job after graduation. I made connections that will last long after my graduate, I built my professional network and get to know people who can help me land that dream job post-graduation.

### 2.2.6 Key challenges

We have faced different challenges during the last 6 months, some of them are:

* **Activities that often takes place due to the structure of daily life of the district**. Every day, comes with its own urgency. Sometimes you wake up with a given plan, but once you arrive to the office one of the supervisor give you an other task that you can’t deny.
* Time was not enough to cover what I was supposed to learn but the basics are the essential and all of what I learnt, I took it as essential.

# **CHAPTER THREE: CONCLUSION AND RECOMMENDATIONS**

## **3.1 Conclusion**

The industrial Attachment was for me a big experience that I have gained and also being in a good environment that supported me and taught me a lot of things which improved the knowledge and skills that I had before such as teamwork skills, network troubleshooting experience, knowledge and experience as far as personal computer maintenance, system analysis and website development knowledge, use and maintain of many electronic devices like printers.

Training is not only oriented towards technical stuff, it is everything, interpersonal relationships, managing and resolving conflict, communication, competition, organizational and human resource management are part of it. we should observe such problems carefully and should be able to overcome them.

I sincerely thank field supervisors and team members for their support. I am now a better person both socially and intellectually.

## **3.2 Recommendations**

I would like to request University of Rwanda administration to extend this industrial attachment period for like two months therefore we should be better on working market and acquire much more in our fields. Strong supervision from school should be improved to encourage and motivate students while they are in industrial attachment. The students should take this internship seriously because it is very useful and helps to put in practice theories learnt in class and gaining a lot of experience from practical work in their field environment.

# References

DISTRICT LOCATION AND GOALS : [**https://www.nyamagabe.gov.rw/index.php?eID=dumpFile&t=f&f=40948&token=92c92862c9ddf8544029152ce7007287dcbb4336**](https://www.nyamagabe.gov.rw/index.php?eID=dumpFile&t=f&f=40948&token=92c92862c9ddf8544029152ce7007287dcbb4336)

**DHCP and NAT on Router configurations**

**https://ipcisco.com/lesson/router-dhcp-configuration-with-packet-tracer-ccna/**

VLAN configurations

<https://www.computernetworkingnotes.com/ccna-study-guide/configure-dhcp-server-for-multiple-vlans-on-the-switch.html?fbclid=IwAR2XDLaX5Pr1wKI62dSb9uxgcMfZ30TC46MEov3UkZXvkqnBuzHGk72wchI>