STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

(SIWES)

(MAY 10TH, 2021 – OCTOBER 8TH, 2021)

AT

100 KOBO LOGISTICS LIMITED

PLOT 12 FUNSHO WILLIAMS AVENUE, IPONRI COSTAIN

BY

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SUBMITTED TO

THE DEPARTMENT OF COMPUTER AND INFORMATION SCIENCES,

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DEDICATION

I dedicate this report to God Almighty for His guidance, undeserved grace and favor all through my industrial training experience. I am forever grateful for His help in making my SIWES a wonderful learning experience.

I also dedicate this report to my parents, Mr. and Mrs. Adetokunbo Adegboye and my siblings for their sacrifice, love and support all through the period of my internship.

Lastly, I dedicate it to my Industry Supervisor Dr. Dumebi Okwechime who reshaped my perspective on the data and Nigerian tech industry, mentors, colleagues and the entire Data science department in KOBO360, for the knowledge in all read imparted daily throughout my stay there.

ACKNOWLEDGMENT

My unending gratitude goes to the Almighty God, for His mercy and favor throughout my industrial training. I acknowledge and appreciate my parents, siblings and close friends for their constant help and support.

My gratitude also goes to the entire faculty and staff of the Department of Computer and Information Sciences, because through them I gained the theoretical knowledge which gave me the ability to perform the practical aspects easily.

I also wish to express my sincere gratitude and heartfelt appreciation to the host company (100 KOBO LOGISTICS), for giving me the opportunity to undergo my Industrial Training with them amidst the numerous candidates in quest for such opportunity.

Then I acknowledge the KOBO Data Science Department, specifically my supervisor Dr. Dumebi Okwechime, and other staff that mentored and guided me during my internship training; Mr. Joseph Itopa, Mr. Kayode Williams and Miss Dorcas Balogun.

Finally, I acknowledge every single individual who contributed to my growth and professional development in various ways during this period.

God bless you all

ABSTRACT

This report essentially presents my real-life experiences in a working environment with real operational and procedural structures that I underwent in the course of my training at 100 KOBO Logistics Limited. Hence, the main aim of this report is to present a summary of my 22 weeks industrial training with the Data department of the company.
It depicts the company culture, work processes, resources, equipment and facilities available to bring about world class E-logistic and haulage services.

To enhance my career development skills, various methods and approaches were used during my internship for my training. Some of which were: Timebound analytics projects, problem solving and business strategy sessions, reading relevant materials and question and answer methods.

In summary, this report provides clear and explanatory information on the practical aspects of the theoretical knowledge acquired so far in my course of schooling.

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CHAPTER ONE*: INTRODUCTION*

1.1 ABOUT STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

The Student Industrial Work Experience Scheme (SIWES) is an accepted skills Program

introduced by the Federal Government of Nigeria in 1974 under the Ministry of Education via

the Industrial Training Fund designed to bridge the gap between the classroom and the industry.

It was mandatory for all students in the Sciences to undertake 6 months Industrial Training. The aims and objectives include;

- Help students to develop skills and techniques directly applicable to their careers.
- Expose students to work methods and techniques in handling equipment and machinery that they may not otherwise have access to.
- To prepare students for post-graduation work situation.

1.1.1 RECRUITMENT PROCESS AND ACCEPTANCE

The SIWES letter of placement was collected in April 2021 right before vacation and immediately distributed to several core Information Technology based companies and also Multinational companies in order to access global internship opportunities as well.

These applications led me to apply to 100 KOBO logistics, an E-logistics and Haulage Tech company that partners with various transporters (truck owners and logistic agents) to provide world class E-logistic services via elaborate software solutions and products built in-house. I then sent my SIWES letter and resume to the personnel in charge of human resources and recruitment in the company. I got my acceptance letter in the second week May.

Figure 1: Internship Acceptance letter

1.2 ABOUT COMPANY OF ENGAGEMENT: 100 KOBO LOGISTICS LIMITED

KOBO is a tech enabled logistics platform that connects cargo owners with long haul freight needs, to truck owners that can service them. With only a click of a button on KOBO's mobile and web applications, cargo owners can simply request for any truck of their choice and have their goods picked up and delivered to the required destination.

KOBO was founded in 2017 and is dubbed the Uber for freight services as the company connects truck owners with producers and distributors for long haul trips. KOBO has a vision to power enterprise and the economy through logistics and a mission to build the global logistics operating system to drive efficiency and affordability in supply chain.

Figure 2: Founders of KOBO at Trailer-park in Apapa Lagos.

1.2.1 100 KOBO LOGISTICS LIMITED'S INTERNSHIP POLICY

From the start of the internship programme till the end, an engaging experience is provided. This provides students the opportunity to work directly under seasoned and well-grounded professionals, which goes a long way in helping them navigate and pursue successful career paths. The experience of the work place, the insights and the skills gained during the IT program would be priceless for the future careers of every student engaged in the program. The internship program enables students to:

- Build work related skills relevant in the business environment through constructive feedback and supervision.

- Gain insights into possible career options and opportunities.

- Improve their general business/ industry understanding.

- Convert all acquired knowledge of theories and concepts that were learnt from their university to practical.

100 KOBO Logistics Limited ensured that all their student interns were able to maximize all aspects of the internship program designed for their development.

1.3 SUBMISSION OF ACCEPTANCE LETTER

The acceptance letter given by the head of the Human Resource Department of 100 KOBO Logistics Limited was forwarded to the Covenant University SIWES email address: siwescu@covenantuniversity.edu.ng, in which a feedback email of acknowledgement was received on the 22nd of May 2021.

A few days after commencing my internship at KOBO, I submitted my Students Commencement of Attachment Form (SCAF) to the ITF office located at Plot 12 Funsho Williams Avenue, Iponri Costain.

1.4 COMMENCEMENT OF INTERNSHIP

The internship officially commenced on the 10th of May 2021. It was kicked off by a briefing with the head of the Human Resource Department; Mrs Damilola Babalola, on the company policy, the health safety and security. After the briefing I joined the visibility arm of the operations team that monitors all the ongoing freight delivery trips. I was temporarily placed under the head of the visibility team Mr. Tolulope Magbagbeola, a seasoned logistics operations specialist. While working in the visibility team, I learnt a lot by monitoring live trips through a control dashboard, identifying and reporting safety incidents that required immediate attention and resolution.

A week after my onboarding I transitioned from the visibility arm of the operations team, to the company's Data team where I had the opportunity to work on a few projects and several tasks which would be discussed further in this document.

I was then assigned to Dr. Dumebi Okwechime the company's Chief Data Officer and a seasoned data specialist, who gave me a brief overview of the company's goals and our KPIs as a department.

CHAPTER 2: FACILITIES AVAILABLE
2.1 FACILITIES AVAILABLE AND DETAILS

Facilities worked with were mainly software equipment due to being in the data arm of the technology company. All equipment and software play important roles and downtime of anyone has its effect round the company. The facilities that were important for the success of my internship include:

- Personal Computer (Laptop): I was provided with a laptop from the company, which I used to carry out all official duties such as communicating with my direct supervisor and other personnel in the organization and for running all analyses and projects on the instruction of my supervisor.

- Internet Facility: The company provided wireless internet connection to carry out research related tasks and to download necessary software applications, updates and files.

Figure 3: Cisco Access Point

- Integrated Development Environments (IDEs): Software applications that provide that provide comprehensive facilities to computer programmers for software development. An IDE normally consists of at least a source code editor, build automation tools, and a debugger

  The IDE I used often was Jupyter notebook because it is one of the most suitable and convenient IDEs for interactive computing with its highly organized functionalities.
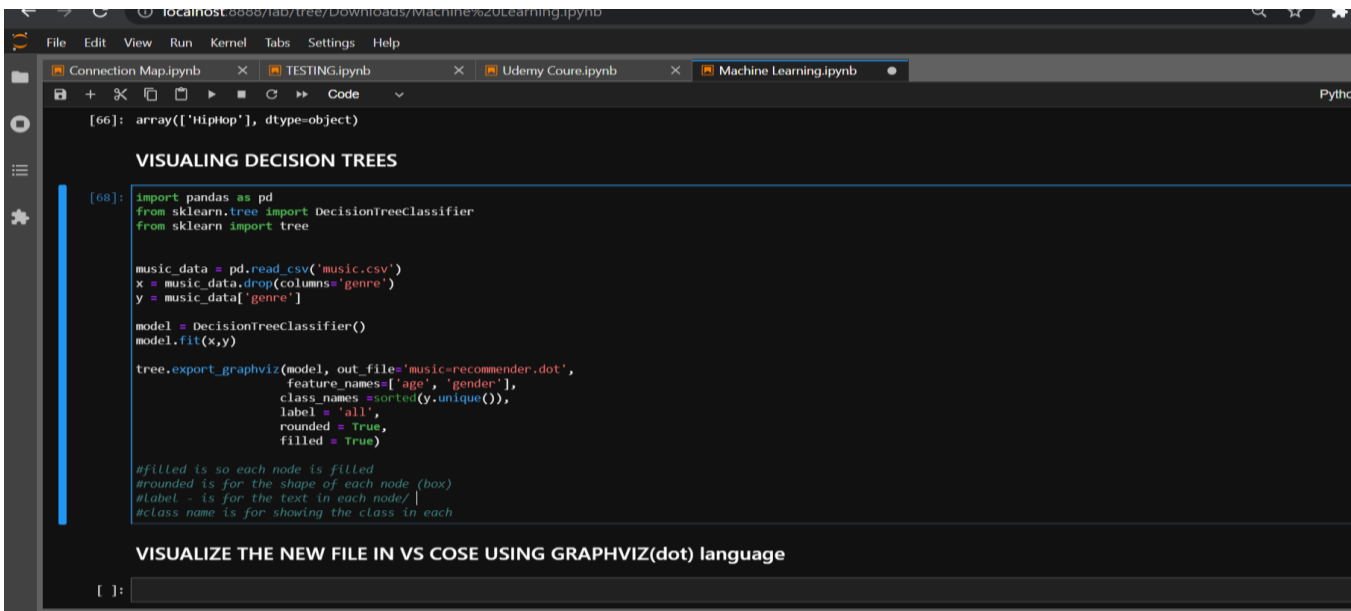
Figure 4: Jupyter Lab

- Printers: Paperwork though used occasionally at the office when official documentation was necessary, was a vital tool in my internship. This was so as I and a number of colleagues in the data team were instructed by our boss to provide support to the company's Global Head of Credit Portfolio Management in verifying payables data for our operations outside Nigeria.

2.2 QUALITY OF COMPANY BASED SUPERVISION

My company assigned supervisor for the duration of my internship was Dr. Dumebi Okwechime, the Chief Data Officer of the organization, a seasoned Data scientist and engineer of about 15 years of experience in the field, having worked in executive positions in various organizations before joining 100 KOBO Logistics Limited.

He started off my internship journey by asking me how well I thought I understood the business's operations and process. From my response he gauged my level of

understanding of the business, he then proceeded to explain in detail how the business operates and the current milestones the company is trying to achieve. After this he laid out one of the key performance indicators for the data department and how I would be coming in to help achieve that indicator with a series of projects.

As the main method by which I learnt and developed during this internship was on-the job training, I worked on a series of projects as instructed by my supervisor who allocated them based on the business' needs. This was a different approach compared to the traditional full schedule that would be given at the beginning of such a program.

The projects I worked on were:

- Customer behavioral segmentation

- Exploratory Data Analysis on the company's trips data

- Geospatial analysis for discovering potential route links to enable reverse logistics

- Building a machine learning model to predict usability of water.

2.3 KNOWLEDGE GAINED

The invaluable knowledge of computer science equips one with skills that are applicable in all areas of life. Every day operations and problems in the industry require analytical thinking with the application of a problem-solving mindset to be resolved.

Working and interacting with various teams and departments at KOBO taught me a lot about the new innovations and disruptions in the technology world and in the software

industry. The internship was an endless learning process. Everyday there were new challenges, new solutions being sought after and new things to learn. The knowledge I gained can be divided into technical (hard skills) and non-technical (soft skills).

2.3.1 TECHNICAL SKILLS GAINED

Although I initially planned to merely gain data analysis and business intelligence skills during my internship program, I was constructively challenged and encouraged to learn and develop new skills such as data wrangling, exploratory data analysis and building machine learning models. This challenge introduced me to a lot of opportunities.

- **EXPLORATORY DATA ANALYSIS (E.D.A)**

Upon joining the data team at KOBO, my supervisor instructed me to carry out EDA on some data sets. Exploratory data analysis refers to the critical process of performing initial investigations on data so as to discover patterns to spot anomalies, to test hypothesis and to check assumptions with the help of summary statistics and geographical representations. It is the good practice of understanding the data first and trying to gather as much insights from it as possible, before getting them. In statistics, **exploratory data analysis** is an approach of analyzing data sets to summarize their main characteristics, often using statistical graphics and other data visualization methods. A statistical model can be used or not, but primarily EDA is for seeing what the data can tell us beyond the formal modeling or hypothesis testing task. Through Exploratory Data Analysis I was able to find out the total number of rows and columns in the dataset, the number of dependent and independent variables. I identified

the columns and their corresponding data types and which of them had null-values. Next, I ran summary statistics, using the describe () function I viewed the count, mean standard deviation, minimum and maximum values and the quantiles of the data.

Figure 5: Exploratory Data Analysis

Figure 6: Exploratory Data Analysis

- **BUSINESS INTELLIGENCE**

  Business intelligence is any activity, tool or process used to obtain the best information to support the business process of making decisions. This is the process of analyzing and reporting historical business events. It is the step that precedes predictive analysis. It consists of two things: analyzing past data and extracting useful insights and creating appropriate models.

  It is essentially timely, accurate, high value and actionable business insights and the work processes and technologies used to obtain them. The Business Intelligence team was in charge of creating regular and on demand reports and live interactive dashboards for all the different departments in the company and for executive members. The team mainly uses Microsoft Excel. SQL and Microsoft power BI as the tools for operating. The team constantly worked well in disseminating the large number of requests gotten from various departments and individuals on a regular basis as the display of information played such an important role in the company's portfolio and product profile.

  While in the B.I. team I:

- Liaised with the operations visibility team to get the requirements of the dashboard needed to monitor live the safety incidents that occur during trips and sought permission to collaborate with the visibility team in building an interactive dash board

  - Built a fundamental dashboard using Microsoft excel to model the company's

    control dashboard where key metrics and information are displayed for various

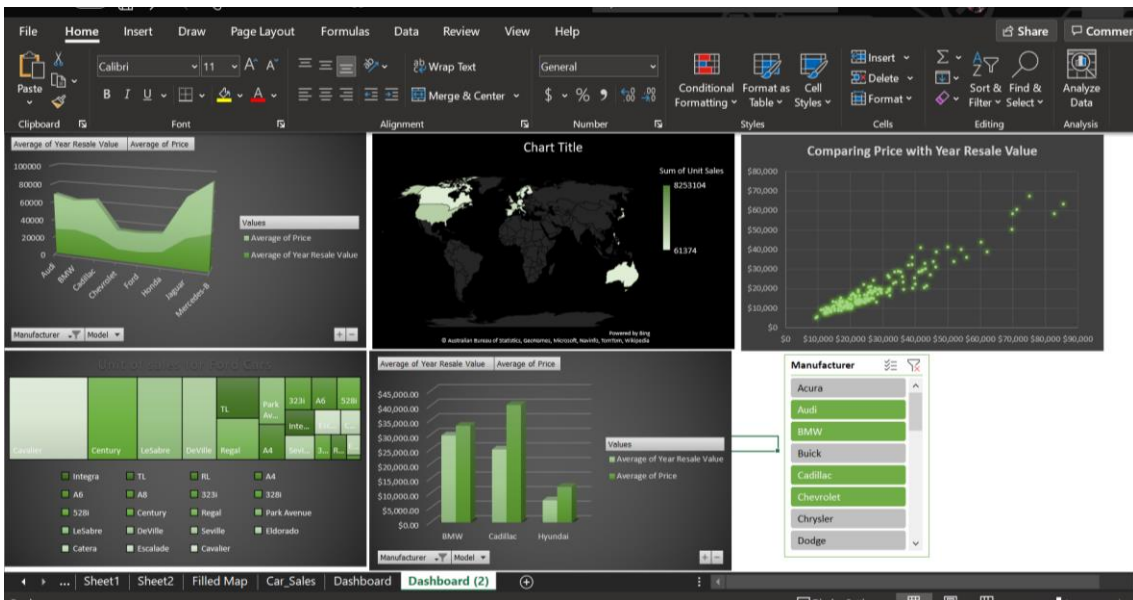   departments.

Figure 7: Excel Dashboard

- **MACHINE LEARNING:**

    Along with the 2 data scientists in the company, I worked on a project to create a price estimator machine learning model that was deployed on the company's website to provide customers with real time and accurate pricing of logistic trips using historical data contrary to the previous price system that was purely logic based.

Feature Selection, Encoding, and Normalization

###source, destination, goodType, goodCategory, fleetAsset_type

```
In [58]: !pip install category_encoders

Requirement already satisfied: category_encoders in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (2.
2.2)
Requirement already satisfied: pandas>=0.21.1 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from c
ategory_encoders) (1.1.5)
Requirement already satisfied: scipy>=1.0.0 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from cat
egory_encoders) (1.5.3)
Requirement already satisfied: statsmodels>=0.9.0 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (fr
om category_encoders) (0.12.2)
Requirement already satisfied: numpy>=1.14.0 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from ca
tegory_encoders) (1.19.5)
Requirement already satisfied: scikit-learn>=0.20.0 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages
(from category_encoders) (0.24.1)
Requirement already satisfied: patsy>=0.5.1 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from cat
egory_encoders) (0.5.1)
Requirement already satisfied: python-dateutil>=2.7.3 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages
(from pandas>=0.21.1->category_encoders) (2.8.1)
Requirement already satisfied: pytz>=2017.2 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from pan
das>=0.21.1->category_encoders) (2021.1)
Requirement already satisfied: six in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages (from patsy>=0.5.1
->category_encoders) (1.15.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in /home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages
```

```
In [59]: #from sklearn.preprocessing import LabelBinarizer
         #from sklearn.preprocessing import OneHotEncoder
         import category_encoders as ce
```

```
In [60]: # integer encode

         encoder = ce.BinaryEncoder(cols=['source','destination', 'goodType', 'fleetAsset_type'], return_df=True) #,'destination', 'goodT
         #Fit and Transform Data
         X = encoder.fit_transform(X)
```

```
/home/ec2-user/anaconda3/envs/mxnet_p36/lib/python3.6/site-packages/category_encoders/utils.py:21: FutureWarning: is_categorica
l is deprecated and will be removed in a future version.  Use is_categorical_dtype instead
  elif pd.api.types.is_categorical(cols):
```

Figure 8: installing encoders to fit data set


```
In [63]: from sklearn.preprocessing import StandardScaler

         # define standard scaler
         #scaler = StandardScaler()
         # transform data
         #X = scaler.fit_transform(X)
         #X
```

```
In [ ]:
```

```
In [64]: from sklearn.ensemble import RandomForestRegressor
         from sklearn.ensemble import GradientBoostingRegressor
         #from xgboost import XGBRegressor
         from sklearn.metrics import mean_squared_error, r2_score
         from sklearn.model_selection import train_test_split
         from sklearn.model_selection import RepeatedKFold


         model_rgr = RandomForestRegressor(n_estimators = 700, random_state = 5)
         gbr = GradientBoostingRegressor()
         #xgr = XGBRegressor()
```

```
In [65]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)
```

```
In [66]: #Training the algorithm with the sample dataset

         model_rgr.fit(X_train, y_train)

         #Prediction
         Predict_y = model_rgr.predict(X_test)

         #Evaluating algorithm performance
         #MSE Result
         mse = mean_squared_error(y_test,Predict_y)
         print('Root Mean Squared Error:, %.2f' % np.sqrt(mse))
         #Variance score: 1 is perfect prediction score
         print('Test Variance Score: %.4f' % r2_score(y_test, Predict_y))

         time.sleep(1)
         #rint('Root Mean Square Error: %.4f'%rmse)
         #Run the model against the test data presented through a plot
         fig, pX = plt.subplots()

         pX.scatter(y_test, Predict_y, edgecolors=(0, 0, 0))
```

Figure 9: Training the data set and using Machine learning Algorithms

- **LOGISTICS FIELD OPERATIONS**

  In order to truly understand the business' operations and create value that affects the

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bottom line, I and all the new staff members, in different departments engaged in an important training focused on learning in depth about the company's major products and field operations which are the core of the business. Via this training, I learnt the operational flow / process of how a customer requests a trip, how the trucks accept requests and how the trip is documented from start to finish along with issues that occur along the way to the destination such as diversions and theft by /notorious drivers. I was then trained on how to use the company's software products which include a customer dashboard where customers can request for trucks and monitor trips, the control dashboard where the business uploads regular reports on trips, analytics and insights are displayed on the various activities of the business and notifications are sent to all the parties.

Figure 10: Company Field Ops Training Agenda
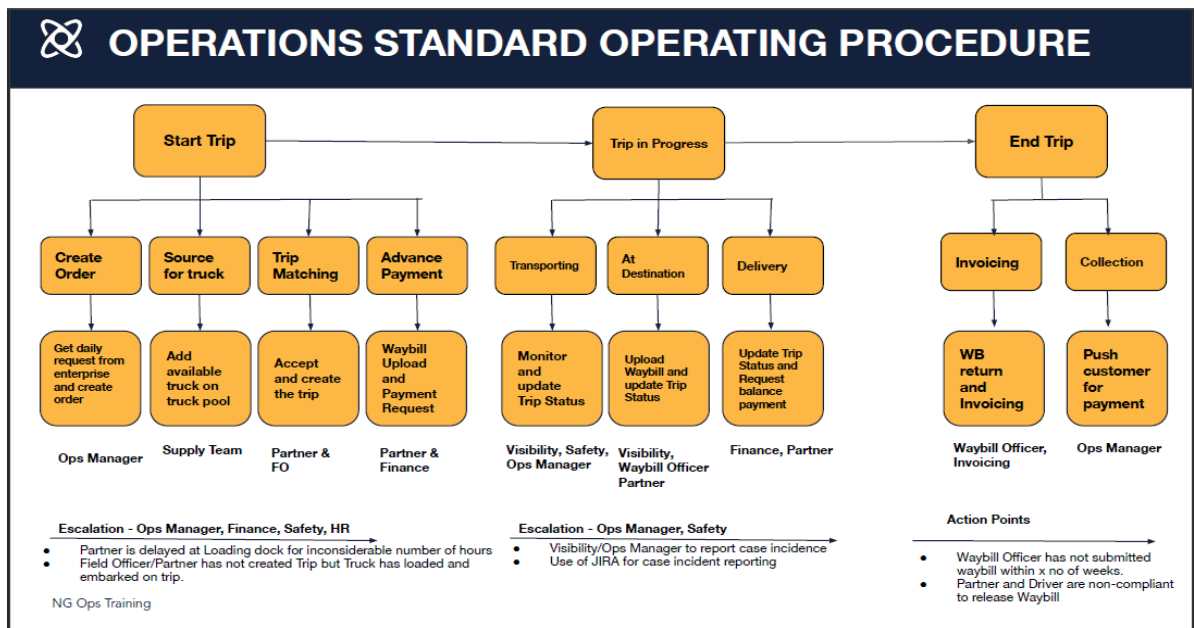
Figure 11: Operating Procedure

As field operations lie at the center of the business, most of the training was geared towards practicalizing the operational process of the business. So, for the period of hands-on experience our objective was to be able to deliver trips from end to end. To achieve this, we were present at the loading site (customer's factory), then we checked for availability of trucks by meeting up with one of our field agents in charge of our business in that particular factory. Next with the help of the field agent, we contacted the logistics unit of the customer for the available loading orders so we could execute. After that was truck inspection to ensure the truck was in good condition. Then we directed the driver to the loading bay where the truck was loaded with the right content, then we placed our wireless trackers on the goods. Shortly after that. the trip was active on our platform, we issued a loading waybill to the driver and then we tracked the trip till completion.

Figure 12: Field Operations at Unilever Factory, Agbara Ogun State

2.3.2 NON-TECHNICAL/ SOFT SKILLS GAINED:

Internships are one of the best avenues for indispensable professional experience and mentoring. They allow one to practicalize the theories and concepts that has been learnt throughout one's college studies.

As it is often said that a person's technical skills are not the sole determinant of success in life but rather a combination of those technical skills with soft skills is what set people up for success. Hence, a few transferrable skills I gained during my internship experience include:

- Critical and Analytical thinking: This is one of the most vital skills I learnt during my internship. It is the ability to analyze and evaluate various situations. It's application spans across many things from project planning and execution to relating with one's boss.

- Collaboration and Team work: I had the opportunity of working with a team of highly intelligent and experienced data professionals who always imparted knowledge to me at every discussion and project. We had a strong collaborative culture that helped us hit certain targets and finish some projects before their deadlines.

- Research Skills: as the mode of my internship as majorly on the job training, I had to read and research on new things everyday to be able to catch up in such a fast-paced environment.

- Communication Skills: I learnt greatly to never underestimate the ability to communicate clearly and effectively while working with people. Both oral and written communication played a vital role in the success of many of my endeavors in my internship.

- Adaptability: Every environment comes with its dynamics and challenges, but integrating into the work force at KOBO was not an issue for me, thanks to my ability to adapt quickly to their work environment and culture.

- Other skills include; Time Management, problem solving, responsibility and integrity.

CHAPTER THREE: CONTRIBUTIONS AND CHALLENGES

3.1 *CONTRIBUTIONS*

Internships are a great medium for young adults to showcase their creativity, willingness to learn and problem-solving ability with whatever task, project or activity that is put in their hands. This includes contributing to the goals of the company and being an adequate of great team player. KOBO did a great deal in making interns feel like a part of the company, as valued, creative members of staff who can make positive impact and innovative contributions to the company's processes and products.

3.1.1 APPLICABILITY OF KNOWLEDGE GAINED

During the course of my internship, I acquired invaluable knowledge on the field of data science, E-logistics and business process management, all of which have impacted my life and future immensely and I plan to retain and expand on this knowledge.

3.1.2 CONTRIBUTION TO FIELD OF STUDY AND EDUCATIONAL CAREER:

Data science and operational research are key areas in the field of Computer Science that I am passionate about. During my internship I was opportune to work on a few data analysis and machine learning projects that impacted the company and I got to shadow the head of a business unit and get the practical applications of the training I underwent on E-logistic operations. Data science which was tagged – "The sexiest job in the 21st century" by Harvard Business Review almost a decade ago, is living up to its name as companies today still compete to hire the data science professional and I do not take for

granted this opportunity of getting a huge amount of exposure to these areas at such an early stage in my career. Machine Learning would be an influencing factor in my final year project in which I hope to put to practice the skills gained from my internship.

3.1.3 CONTRIBUTION TO 100 KOBO LOGISTICS LIMITED's GOALS:

While on my internship at KOBO I took on special tasks and was involved in a number of projects some of which were identified personally to help meet some of KOBO's major or minor goals. One of these was aiding the operations trip visibility team to develop a safety incidence dash board.

- **DEVELOPMENT OF AN OPERATION'S TRIP'S AN OPERATION TRIPS' VISIBILITY SAFETY DASHBOARD**

Having worked with the company's trips visibility and safety Unit, I was well aware of some of the issues they faced in viewing and reporting the various safety issues that happen during trips. With this knowledge in mind when I started working in the data team, I liaised with the visibility team to get the requirements of the dashboard needed to monitor live the safety incidents that occur during trips and then I convinced the business intelligence analysts to collaborate with the visibility team in building an interactive dash board and provide automatic daily safety reports.

Through the dashboard the visibility team was able to quickly identify and successful operate on their 3-day timeline of issue resolution and Expected Closure Timelines per route (time for trucks that have broken down to be fixed or transloaded)

3.1.4 CONTRIBUTION TO THE LARGER SOCIETY

- **DATA AND A.I. DRIVEN ORGANIZATIONS**

With the vast amounts of data now available, companies in almost every industry are focused on exploiting data for their competitive advantage. Virtually every aspect of business is now open to data collection This broad availability of data has led to increasing interest in methods for extracting useful information and knowledge from data which in essence is the realm or field of data science. Computers have become far more powerful, networking has become ubiquitous,

and algorithms have been developed that can connect datasets to enable broader and deeper analyses than previously possible. All these have helped in creating a lot of solutions to improve the way and standard of life for the average man.

To have an introductory experience into machine learning, I was encouraged and guided by one of the data scientists at the office to participate in the 2021 Zindi Water portability Classification Hackathon for data scientists. Through the contest I learnt how to effectively normalize a data set, using random forest and decision tree classifiers, plotting kernel densities, correlation diagrams and conduct standardization.

GLOBAL LOGISTICS OPERATING SYSTEM

KOBO is building a Global Logistics Operating System (G-LOS), To increase efficiency, transparency, visibility, affordability, and reliability of supply chain and transportation. The company is building this system for quite a number of beneficiaries which are:

• The billions of farmers across the globe who lose more than 40% of their produce due to inefficient and unreliable supply chain

• For manufacturers whose growth are crippled by unreliable and unaffordable logistics solutions • For individuals who just want to easily orders things and get is quickly without frictions

• For people who just want to move swiftly and affordably from point A to B to C

• For logistics operators that want to use data and smart technologies to drive efficiency and reliability in order to increase customer satisfaction, achieve scale, and increase profitability

• For millions of drivers who want job security, predictability, flexibility, and transparent pricing • For a society with less carbon emission, reliable transportation, and affordable products.

3.1.5 BRIDGING THE GAPS IN KNOWLEDGE

The job market and labor force has drastically evolved and today possessing knowledge is not enough to survive let alone through in any endeavor. Proficiency in the practical aspects is vital. Gaining real world experience, identifying what is in demand and quickly adapting to the necessary context is needed to successful navigate to a fulfilling career. This experience has made me value and cherish the role of a computer scientist both as a specialist and as an ever-evolving problem solver. The Industrial Training was very much needed in the process of discovering one's career possibilities in the employment market and practicalizing the theories learnt in school for 3 years. Hence, I would

beseech that the Student Industrial Work Experience Program be unequivocally stressed and taken an interest in, thus, to prove its significance.

3.1.6 WORK CULTURE AND CULTURE SHOCK EXPERIENCE

KOBO's unifying theme is "Africa Rising", drawn from the deeply rooted African values of ambition, openness, hope and respect. KOBO promotes the values of creativity, drive and imagination, which are vital to Africa's economic future. KOBO has a conducive work environment to bring about the best working experiences for their passionate staff. The company is filled with Highly motivated and extremely smart people working on a mission possible task (G-LOS). KOBO is blessed with dynamic partners who have the financial strength, relationships, and are very committed to the mission and lastly strategic partnerships with governments, and key organizations.

3.2 CHALLENGES FACED AND PROJECTS IDENTIFIED
3.2.1 TECHNICAL CHALLENGES ENCOUNTERED AND SOLUTIONS

As in any and every form of human interaction and organization challenges are inevitable and my introduction to the cooperate world through this internship was not any different. The challenges faced range from those associated with tasks carried out to relating with colleagues. They are explained below:

a. **Reverse Logistics Geospatial Analysis Challenges**

This project had its fair share of challenges. I had to deal with a number of

stakeholders and ensure that the needs and objectives of the project were met.

During the course of this project, some of the challenges faced were:

- Incorrect pickup and delivery station location coordinates

  While working on the geospatial analysis project I identified a number of pickup and delivery station location coordinates that were wrong and I brought it to the attention of my supervisor. I was then instructed to reach out to the head of the software engineering team who assigned an engineer to trouble shoot the issue and put data validation measures in place.

- Slow Information dissemination: Working with different stakeholders on the project was a bit tasking as over the course of the project I had to interface with the software development team, the lead data scientist and the Chief Data Officer. This caused several delays and merry-grounds in the project. However, through collaborative meetings, the challenged were reduced.

- Slow response from software engineers in solving the problem

  Although an engineer was assigned to help me trouble shoot the wrong coordinates data, it took a while to pin point the cause of the wrong input and resolve the issue as all of the engineers in the company had their hands full working on the company's latest software product.

- Source code bugs: as the pain of every programming or software project debugging was unavoidable and a major challenge.

b. **Time management:** This period taught me a lot about managing my attention along with time as there were a number of tasks to do on a daily basis as well as special tasks that came up on request. Time management was instrumental to achieving my tasks.

c. **Overwhelming tasks:** The technical and non-technical value I gained from the tasks that I was given cannot be overemphasized. While every task and experience were knowledge filled and impactful, they did feel quite overwhelming when I had a lot of things to do at once. But with prioritization and help from staff members in the data team I was able to get all my work done.

3.2.2 CHALLENGES FACED BY THE COMPANY AND MY CONTRIBUTION

1. Clean data:

   A major priority for the company since the beginning of the year is having clean and usable data. As a startup, not much focus was placed on data gathering and suitable data architecture at the inception of the company, so the onus lied on my division – the data team to build and maintain the data pipeline, wrangle data and create interactive dashboards and reliable reports for all the departments in the company to utilize. To aid in reducing this on-going work load I engaged in a lot of data cleaning to ensure the data scientist who needed to do quick and intime analytics and modeling had clean data to work with when they required it.
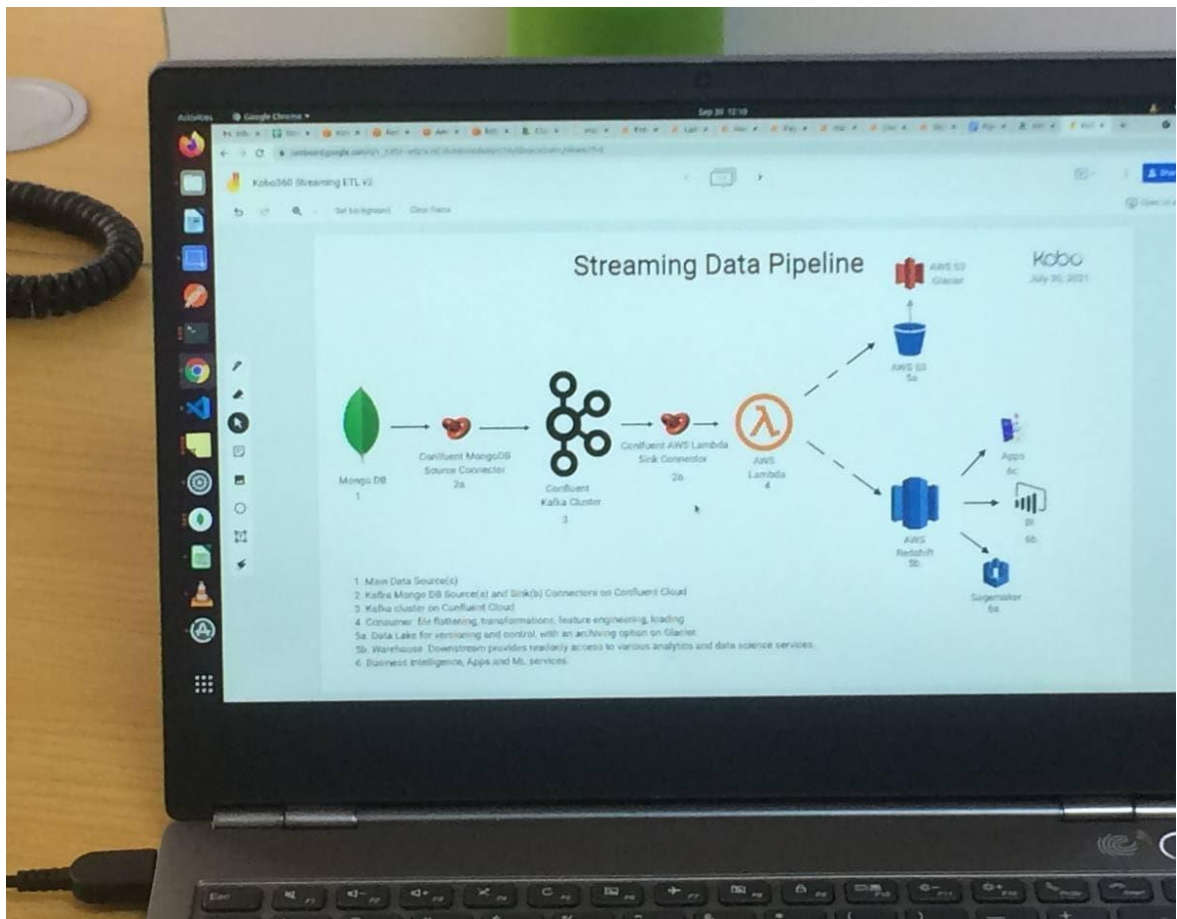
Figure 13: Data Engineering Pipeline Development

2. Synergy between the data team and other divisions:

    As a relatively young department in the company, the data team – where I worked in, had a lot of work to do in the areas of data verification, data pipeline switch to a more sustainable structure and regular creation of dashboards and reports for various business needs. These required my department to work hand in hand with every other department in the organization. This was not an easy task, as a number of employees could be difficult either by withholding vital information needed to carry out necessary analysis for the business, being hesitant to work with the data

team and quite a number of employees just being negligent to good data literacy policies. To tackle this challenge, I proposed to the head of my department along with the data engineers, scientists and analysts the idea of infusing each department in the company with a data-stewards who is involved in the day-to-day operations of each unit who aids in all of the data needs and ensures they make data driven decision. These data-stewards then report back to the main data team so we can then utilize the vital and accurate information given to us to operate efficiently.

3.2.3 PROJECTS IDENTIFIED: ENHANCING REVERSE LOGISTIS VIA GEOSPATIAL ANALYSIS:

To enhance reverse logistics for the company I was instructed to conduct geospatial analysis of the trips made by the company's transporters. To initiate the project, I built an interactive map using the python library called folium which allows one to call the Leaflet.js javascript library. I configured the map I built to the EPSG code (European Petroleum Survey Group) so as to have the accurate Coordinate Reference System for the region in which I plotted my map. Then I displayed the maps of our pickup trips within Nigeria depicting the respective loading points firstly as individual marker points and
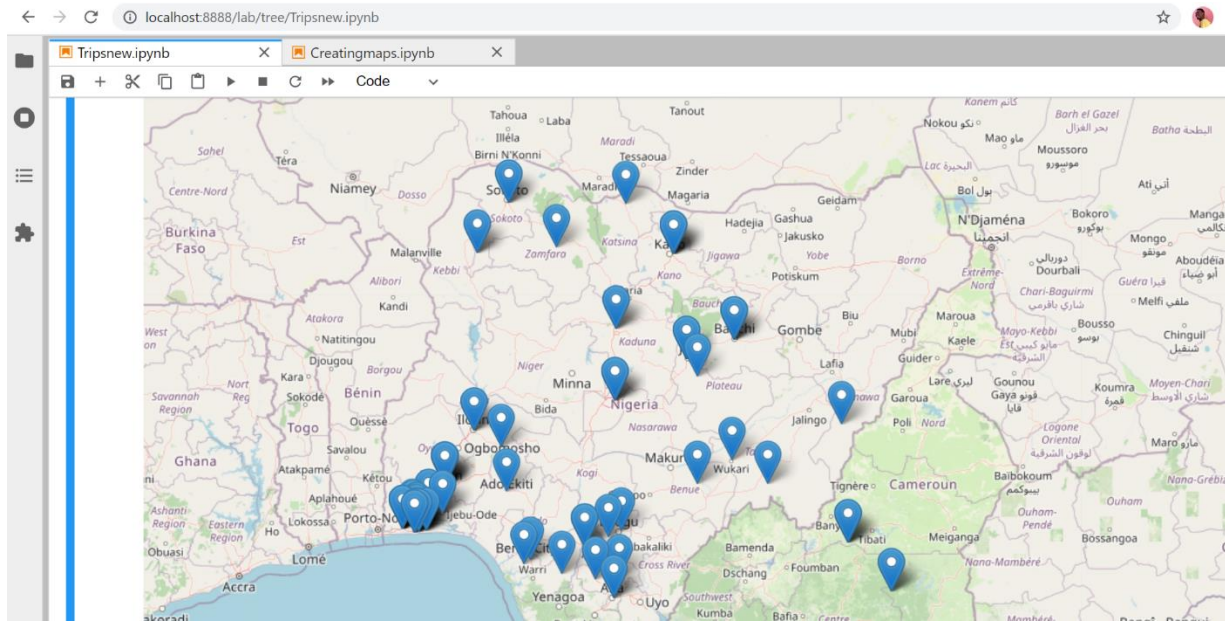
then collectively.

Figure 14: Nigerian map with Folium Markers depicting the company's delivery locations
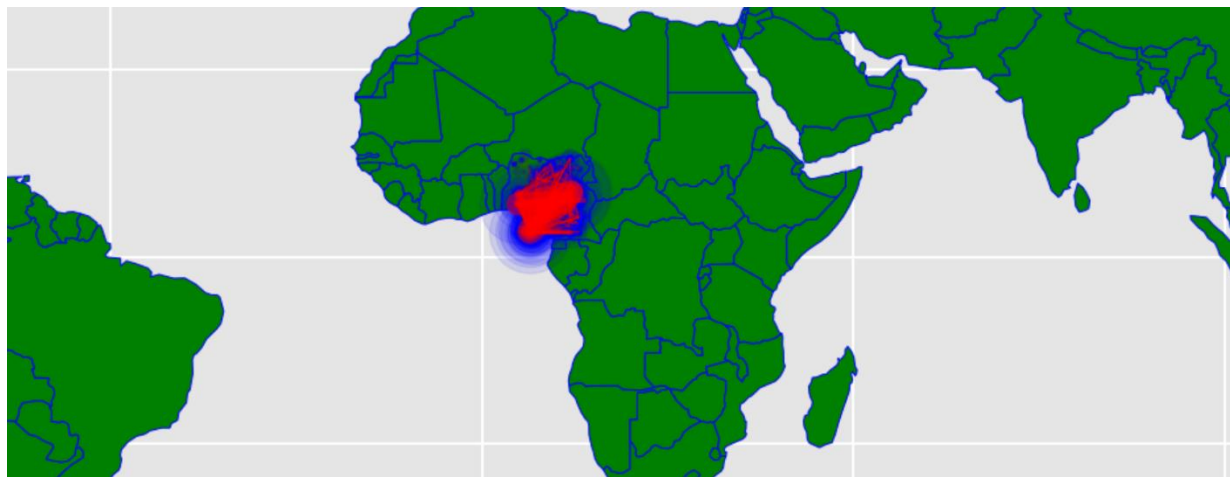

Figure 15: African Map depicting overview of connected trips in Nigeria

Then I plotted a map of our delivery trips to respective drop off locations in the country.
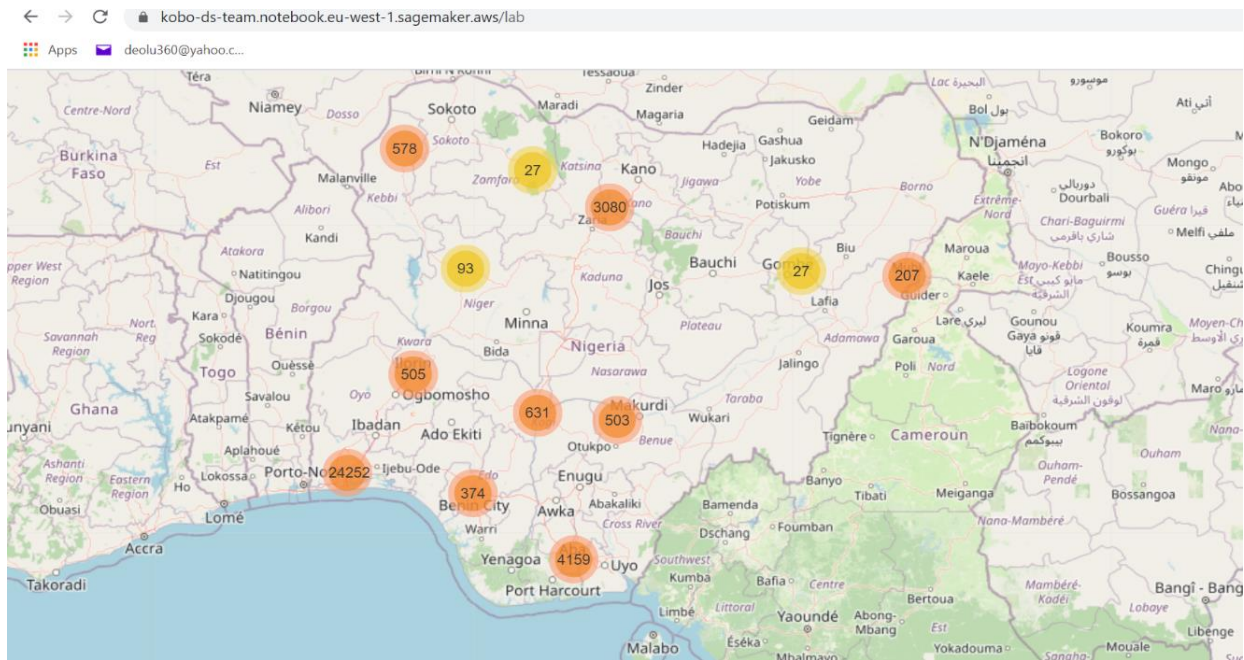
Figure 16: Overview of trip numbers per states and regions

Next, I plotted connection maps to draw connection lines between states to depict the trips leaving a particular state to other states.
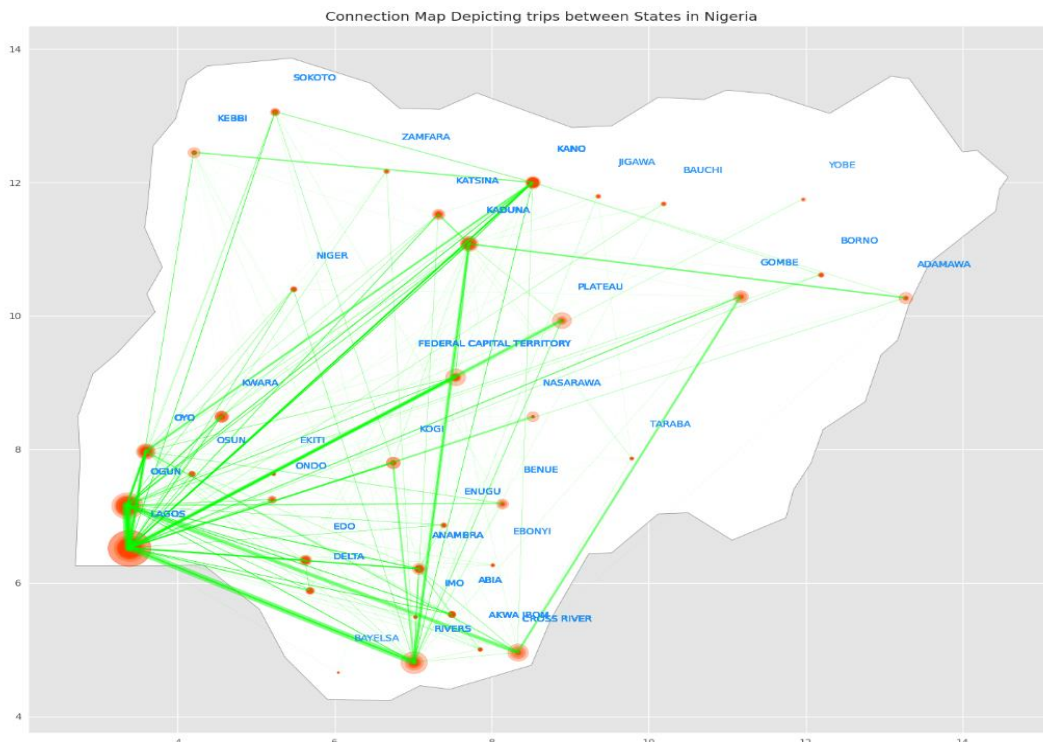
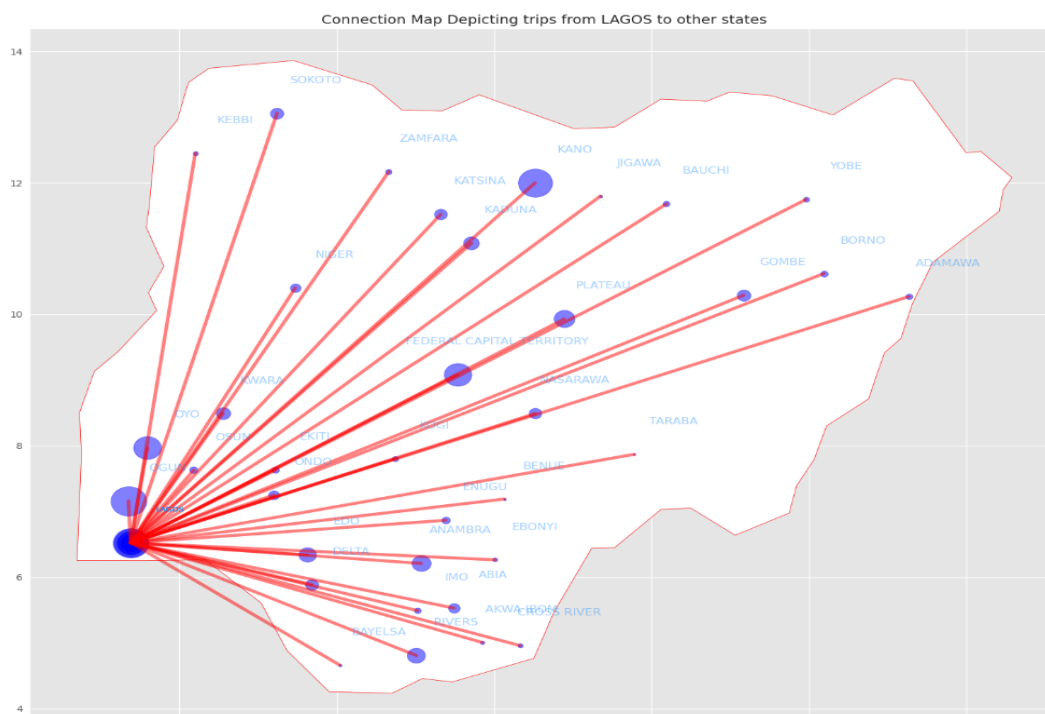*Figure 17: Connection maps depicting trips between states in Nigeria*

Figure 18: Map showing trips leaving Lagos

- **CHALLENGES FACED WITH THE GEOSPATIAL ANALYSIS**
    - Debugging of Code: There were some difficulties experienced when coding for the maps.

    - Another challenge was communicating with key stakeholders who all had very busy schedules.

CHAPTER FOUR: CONCLUSION AND RECOMMENDATION

In retrospect, I can genuinely say that my experience at 100 KOBO Logistics Limited was by far the best 6 months of my life as I gained vital work skills, and I also got the opportunity to meet many brilliant, innovative and collaborative people.

In addition to that, working at KOBO, I felt part of the team as I was allowed to assist on projects and my contributions were not only appreciated but also taken into consideration in making some business decisions.

I want to appreciate the data department and all mentors and supervisors assigned to me and the Computer and Information Sciences Department, Covenant University.

I would conclude by encouraging more opportunities for such experiences that give a local and global view of our different fields.

Thank you and God bless you.