# DESIGN AND IMPLEMENTATION OF PACKAGED FOOD VERIFICATION SYSTEM USING MOBILE PHONE

**(A CASE STUDY OF NAFDAC, ILORIN)**

*BY*

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## CERTIFICATION

This is to certify that this project was carried out by MAJA RIDWANLLAHI AKOREDE with Matriculation No. ND/22/COM/PT/489 as part of the requirement for the award of National Diploma (ND) in Computer Science.

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## DEDICATION

This research work is dedicated to Almighty Allah, the uncreated creator for his mercy and protection on me throughout my program in this citadel of learning and also to our beloved parents for their support morally, spiritually and financially during the course of running the program.

## ACKNOWLEDGEMENTS

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I must sincerely and specially express my gratitude to my loyal and caring parents Mr. and Mrs. Maja who trained me from childhood to this stage in life, I pray that they will live to eat the fruit of their labour.

I am highly indebted if I fail to express my gratitude to my loving sibling, I appreciate you and I say thank you and God bless you all.

**ABSTRACT**

*This research work describe variation of packaged food (can food) verification system and discuss how a product can be verified and the need for its verification, the project is to provide simpler means to the consumer and regulatory agencies for establishing food authentication and protect the consumers health and life safety and the process of verifying a product currently is not encouraging because it take much time. Brand owner are almost always concerned with counterfeit product. Merchant and consumer can either view counterfeit as low quality over priced deception or an opportunity to save money. It further examines the security threat to a food verification system and countermeasure against such threat. The good approach to this problem is to involve the use of computer by designing the form using Microsoft access 2007 in developing the database and visual basic 6.0 as the programming language to enable keeping accurate record of food and prevent sales of fake packaged food. This guarantee the people's right to good health care and ensure that food packaged (can food) received is genuine and safe*.

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# CHAPTER ONE

## 1.1 Introduction

Products are created by brand owners and handed to third parties (contract manufacturer, shipping company, distributor…) for delivery to merchants for later sale to consumers. These products can range from commodity items (e.g., flour) to limited quantity “luxury” items (e.g., designer handbags) to one-of-a-kind items (e.g., original artwork). Counterfeit products are often created and sold as the “real thing.” Counterfeits leverage the original brand but generally have less overhead due to some combination of lower quality, reduced marketing expenses, reduced support costs and/or reduced corporate expenses (ranging from lower labour costs to failure to pay tariffs).

The three main parties (brand owner, merchant and consumer) are affected differently by the distribution of counterfeits. Consumers either willingly purchase counterfeits at a lower cost or are tricked into buying a counterfeit thinking they are getting authentic merchandise. In the former case they are generally happy, at least initially. The latter case, in some instances, may have little effect, i.e., the consumer may have overpaid for an item. However, more damaging effects may be realized if the product malfunctions. These effects can range from lack of recourse (since the product is not covered by the warranty of the brand owner or manufacturer) to physical harm in the case of food, prescription drugs, mechanical equipment, etc. Merchants and third parties may unknowingly or willingly participate in the distribution of counterfeit products. Brand owners suffer both hard (decreased profit) and soft (brand erosion) losses from counterfeit products.

This research work describes a system that enables brand owners, merchants and consumers to verify the authenticity of a product. It analyses the

different avenues of attack and presents three potential implementations of the system based upon the motivation of the participants and the cost of implementation. The research assumes the reader is acquainted with the production and distribution of counterfeit products.

## 1.2 Statement of Problem

The major and core issue that gave rise to this research work, is on the fact that most of the pharmaceutical drug users seek to use original product but because fake of counterfeit drugs now, do not let one differentiate from the original anymore, and the process of verifying a product currently is not encouraging because it will take much time and before then, the ill person is supposed to take his medication, which is to say that the verification process is slow and not reliable as sometimes you don't get thee feedback at all. This issue is what the research seeks to resolve by developing a secure and reliable system that can function better than the previous one.

## 1.3 Aim and Objectives of the Study

**Aim:** The project is an attempt to turn mobile phones into mobile tools that can help check the problem of fake drugs as many lives has been claimed and many are still endangered by the circulation of fake drugs

**Objectives**

The basic objective of the project is to provide simpler means to the consumer and regulatory agencies for establishing drug authentication and protect the consumers' health and life safety. In achieving the objective, following goals have been set:

- Web based portal / SMS based system / Mobile App enabling the citizens to check the authenticity of the drugs online,

- Tracking and tracing of the drug where manufactured to ensure the reliable supply of drugs to consumers for patient safety and brand protection of manufacturer as well as nation.
- The information like Name of Drug, Name of Manufacturer, Batch number, Date of manufacturing, Date of expiry, Usage of drug (optional) and Composition of drug (optional), to be provided online to the consumer,
- Provide necessary support to the regulatory agencies in prevention of counterfeiting, fraud and illegal sale of drugs.

## 1.4 Significance of the Study

- This project will present in a precise manner, the importance of drugs validity and authenticity to our health. It is believed that if this research wok in full implemented will help reduce the rate of counterfeit in drugs production and uses among individual. It is also expected that the study will benefit the manufacturers of this drugs that is the original company and industry because they will have more sales as the citizens will go for the original one and the fake will have no sales in the market anymore.
- The software developed from this study will be useful to the end users or the customers in helping them to verify the drugs they buy for medication. It is expected that the findings will expose the fake drug sellers in the market and they production companies. By this exposure, the pharmaceutical industry will learn more and stand by manufacturing quality products. It is possible that by this outcome the fake pharmaceutical industries will realistically adjust to the standard of production approved by the world Health Organization (WHO).

- Subsequently, it will go a long way to enhance the computer science students' effectiveness in the society by being capable of carrying out what they have learned, thereby contributing to the building up of the society at the local, national and international levels.
- The research will also be beneficial to the researcher. This is because the study will expose the researcher to so many related areas in the course of carrying out his research. This will enhance the researcher's experience, knowledge and understanding on real live application and solution solving techniques.

## 1.5 Project Study Scope

The Drug verification system and authentication system project is an initiative of the researcher to ensure the genuineness and authenticity of the drugs used within the country imported from any part of the country to ours (Nigeria) basically imported from India and for citizens in the domestic market. The project covers all the drugs sold in our country Nigeria.

## 1.6 Definition of Terms

**Database**: A collection of logically related data to meet the information need of organization.

**GSM**: Global System for Mobile Communication.

**DBMS**: Database Management Software that enable the user to define, maintain Control the database.

**Application Program:** A computer program that interacts with the database.

**MENU**: This is a list of options presented on the screen with each option identified by short code followed by longer description of its purposes.

**Drug**: It is referred to as a medicine or chemical substances that are administered to Patients for curative measures.

**Pharmacy**: A placed in a hospital where medicine or chemical substances are kept, stored and prepared.

**Flowchart**: A diagram that shows connection between the different stages of process of the system.

**Relation**: A relation is a named table with columns and rows Attribute; An attributes is a named column of a relation Domain; A set of allowable values for one or more table.

**Database design**: The process of creating a design that will support emprise mission statement and mission required database e system.

**Software**: These are program for computer which allows certain specific task to be accomplished e.g. word process etc.

**Hardware**: Computer equipment used to perform input processing and system output activates.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1 Introduction

Food safety is a global concern due to the increasing cases of food adulteration, expiry, and poor labeling practices. Consumers often rely on package information to verify the authenticity and safety of food products. However, printed information is susceptible to forgery or deterioration. With the proliferation of smartphones and mobile internet, developing a mobile-based verification system can empower consumers to validate packaged food information on-the-go. Food authentication systems have gained prominence with the rise in food fraud. Technology like blockchain, RFID, and QR codes have been employed for traceability.

## 2.2 Conceptual Framework

The World Health Organization (WHO) defines counterfeit medicine as one, which is deliberately and fraudulently mislabeled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and counterfeit products may include products with the correct ingredients or with the wrong ingredients, without active ingredients, with insufficient active ingredients or with fake packaging. Counterfeit drugs are packaged and labelled to look like actual brand name drugs or generic drugs. This false packaging is to deceive you into thinking that you are buying a legitimate product. Counterfeit medicines and other health products can have harmful effects on patients' health, including death in worst-case scenarios. These fake products are also detrimental to public health, efforts to deal with disease in countries, which are already stretched thin with limited resources for health care. The counterfeiting of medicines has been a problem for at least two decades in many countries around the world. As international markets expand and become globalized, the problem has extended to all countries and regions; even though it remains more prevalent in developing countries. The increase in the commercial use of the Internet has also contributed to a growth of the problem as many fake products are sold illegally on

unauthorized web sites. Drug counterfeiting is the highest weapon of terrorism against public health, as well as an act of economic sabotage. If you use a counterfeit drug, you may be at risk of serious health problems, including unexpected side effects, allergic reactions, or a worsening of your health condition. These can occur because a counterfeit drug may [Akunyili, Dora., 2004]:

- Be contaminated with harmful substances.
- Contain the wrong active ingredient, which may not treat your condition or may cause unwanted side effects.
- Have too little or none of the active ingredient, which will be insufficient to treat your condition.
- Have excessive active ingredient, which can cause unwanted and potentially dangerous side effects.
- Be packaged in phony wrapping, which may have incorrect directions on how to use the medication.
- Fake drugs are worse than the combined scourge of malaria, HIV/AIDS and armed robbery put together. This is because malaria can be prevented, HIV/AIDS can be avoided and armed robbery may kill a few at a time, but counterfeit/fake drugs kill in mass.
- The social problem posed by hard drugs, cocaine, heroin etc. cannot also be compared with the damage done by fake drugs, because illicit drugs are taken out of choice, and by those that can afford them, but fake drugs are taken by all and anybody can be a victim.
- Fake drugs have led to treatment failures, organ dysfunction or damage, worsening of chronic disease conditions and the death of many citizens. The situation tends to become so bad that even when patients are treated with

genuine antibiotics, they no longer respond due to resistance induced by previous intake of fake antibiotics.

A new global campaign by the United Nations Office on Drugs and Crime (UNODC) was launched on the 14th day of January, 2014 to raise awareness among consumers of the $250 billion a year illicit trafficking of counterfeit goods. The campaign – „Counterfeit: Don't buy into organized crime‟ – informs consumers that buying counterfeit goods could be funding organized criminal groups, puts consumer health and safety at risk and contributes to other ethical and environmental concerns.

The campaign urges consumers to „look behind‟ counterfeit goods to boost understanding of the serious repercussions of this illicit trade. - UNODC Press Release [Counterfeit Trade, 2008].

**Why do counterfeit drugs exist?**

The reasons for counterfeit medicines are manifold and diverse. A criminal interest combined with extremely high possible gains, weak or absent regulations and authorities, consumers seeking the cheapest medicines and missing attention to a more than serious problem to name only a few.

This chapter will give an overview of these reasons.

1. **Insufficient or missing regulations**

Without the proper regulation of all aspects concerning the manufacture, the distribution and the sale of drugs the health market of a country cannot be secured with regard to counterfeit medicines.

According to the WHO (1) these regulations should include several points.

- Manufacturers and importers of APIs and / or finished drugs should need a license for production or importation.

− The further supply chain for distribution and sale to the customer should also be subjected to licensing and inspections.

− Inspections of these manufacturers or importers should be possible.

− Before drugs enter the market, either through local manufacturing or through importation, they should need an Authorization.

The problem of insufficient or missing regulations is wide spread. The WHO estimates that 30 % of all countries are missing drug control regulations or cannot enforce them whereas only 20 % have well developed drug regulation systems. The remaining 50 % show varying degrees of effectiveness and regulation.

The problem is even worse when taking a specific look at the African countries. Whereas 54 % have no quality monitoring program for drugs only 19 % have one implemented at all. 77 % of the analyzed countries had no regulation concerning product recalls, so even if counterfeits are detected not much can be done. Only 5 of the 26 countries in the WHO report conducted inspections as anti-counterfeit effort. Also the situation in Africa as described above is very serious other parts of the world also show their deficiencies. An example of existing but insufficient regulations is given by the Ukraine. Here import and export of counterfeit goods is prohibited under the Customs code, however their destruction is not regulated and the goods, including counterfeit medicines, often find their way back to the market.

2. **Insufficient or missing authorities**

The regulations mentioned above have to be enforced on the market. To achieve this it is vital to have a working and effective authority in place asserting the necessary controls on new drugs before they are allowed to enter the market, on the local manufacture and the importation of drugs as well as on the distribution chain for pharmaceutical goods. A lack of such an institution will lead to a flourishing illegal market for counterfeit drugs.

Furthermore, the relevant authority also needs to have backup by suitable analytical laboratories to be able to detect counterfeits.

India for example, although it is one of the world leading countries in terms of manufacture of pharmaceutical goods, is parted in states and territories. Of these 31 parts only 17 have functional laboratories for drug testing and only 7 of these are sufficiently equipped. An overall national Regulatory Authority is missing. Another prime example of insufficient quality laboratory control is the malaria affected sub-Saharan part of Africa where only two WHO pre-qualified laboratories exist.

3. **Insufficient law enforcement and insufficient penalties**

As well as missing regulations and weak authorities will lead to the prospering of undesired counterfeit activities, insufficient law enforcement and insufficient penalties will lead to this effect. If counterfeiters are not persecuted, may it be through corruption, because of insufficient resources, or if penalties are too low for deterrence, they will continue their trade.

### 4. High prices and a disparity between supply and demand

High prices affect the prevalence for counterfeit drugs on two ways. First patients will tend to look for cheaper drugs and will rather be open for less trustworthy sources of the drugs they need. On the other hand a high drug price is of course a major incentive for counterfeiters.

The same holds true for goods where the demand is higher than the supply, besides the fact that the price of the goods in question will also rise.

The major example for counterfeit medicines, Viagra and similar products clearly underline this point. As the demand is high but unmet due to the prescription status, the price and further reasons, customers tend to buy it from the grey and black market, leading to a very high risk of receiving counterfeits.

Unmet demand is also a problem of especially rural areas in developing countries where official, legal channels cannot satisfy the customer needs in regards of pharmaceuticals.

One example is Burkina Faso where, despite the national regulations demanding prescription for all drugs, people tend to buy from illegal but cheaper street vendors where, according to official sources, one in five drugs is counterfeit.

Besides the price the availability of drugs is also a problem in most sub-Saharan countries, where illegal street vendors sometimes are the only source for pharmaceuticals. Complex trade routes, importation, exportation and the problem of free trade zones.

5. **Distribution to the customer can be another problem,** especially in less developed countries where single blisters or even single pills are often sold by non-specialists, counterfeits are inevitable and hard to detect without even the most basic information like producer dates, any batch number or the expiration date.

6. **Higher quality – less detection**

As the techniques in the legal pharmaceutical business evolve, so do the techniques in the counterfeit business. With high quality equipment for the production of counterfeit goods, packaging and labelling, the counterfeits become harder and harder to detect especially for patients and prescribers. This can consequently lead to a higher prevalence of fake drugs, especially in the legal supply chain.

7. **Cooperation of different stakeholders**

It has been mentioned earlier in this work that there are a lot of different stakeholders affected by the problem of counterfeit medicines. These include the legitimate pharmaceutical industry, different authorities like police, customs, the national Drug Regulatory Authorities (DRA) or health professionals and patients.

When the cooperation between these stakeholders is poor, e.g. the industry hesitates to inform the authorities of their findings, this will have massive effects on the safety of the pharmaceuticals market.

Reasons on the supplier side include the fear that detected and publicly announced counterfeits will also negatively affect their brands. There is furthermore the potential problem that the consumer will stop to take their (non-counterfeit) medicines for fear of counterfeits.

7. **High profit margin**

High profit margins are to be made in the counterfeit drugs business even in comparison to other 'branches' of the illegal black market. The production of counterfeits is feasible without large infrastructure and even possible in homes or backyards. Also the 'raw materials' are rather cheap when counterfeiters are willing to risk consumer's life's and neglect all quality assurance and product safety and sterility issues normally connected with pharmaceutical production.

Profits are high: e.g. for 1,000$ investment counterfeit money returns 3,300$, counterfeit credit cards 6,700$, heroin 19,860$, counterfeit cigarettes 43,000$ but counterfeit drugs return up to 500,000$.

The margin is also higher when you look at the per kilo price; whereas a kilogram of heroin brings in 65,000€, the same amount of fake drugs earns in 90,000€.

Therefore the counterfeit drugs business is even more profitable than illegal drugs and at the same time holds fewer risks for the criminals.

## 2.3 Review of Related work

The Indian pharmaceutical industry is 3rd largest in the world in terms of volume accounting for 10 percent of world's production and stands 10th in terms of value. India has leadership position in generic drugs and vaccines. India's total export of Pharmaceutical Products Industry in year 2014-15 is US$15.4 billion with growth of 2.6% over previous year. Indian exports go to more than 200 countries around the globe including the highly regulated markets of US, Europe, Japan and Australia. Every third dose of vaccine administered anywhere in the world comes from Indian manufacturing facility. The domestic Indian

Pharmaceutical market is expected to reach US$ 55 billion in 2020 at a Compound Annual Growth Rate (CAGR) of around 15 percent.

Indian Pharm industry with more than 20,000 registered units is highly fragmented with severe price competition and government price control. There are approximately 250 large units and more than 8,000 small and medium scale units, which form the core of the Pharmaceutical industry in India.

India is increasingly getting recognized as 'pharmacy of the world'. Increasing competence of Indian pharm in the global market place and need for the protection of brand image of the country have led to responsibility for supply of authentic, quality, safe and affordable drugs.

After extensive consultations with the industry, the Government of India decided to be incorporated features of 'Trace, Track & Authentication' need on all medicinal products being manufactured and exported from India. This was primarily to address the threat of fake medicinal products being supplied from outside India under 'Made in India' label.

The agencies/ department/ Ministries of Government of India like Department of Commerce, Directorate General of Foreign Trade (DGFT), Indian Customs, Ministry of Health and Family Welfare, Drug Controller General of India , Pharmaceutical Export Promotion Council (Pharmexcil) and GS1-India are the stake holders of the project apart from Manufacturers/ Exporters/ Whole Sellers/ Distributers/ Retailers and Consumer/ Citizen / Importing country.

## 2.4 Empirical Studies

Nigeria in recent years has been known for being a haven for all kinds of counterfeited products (Erhun et al., 2004). In Nigeria the problem of fake drug proliferation have affected the plausibleness of the Healthcare system leading to unwholesome effect on the consumer resulting to illness, disability and even death. Some of these incidences have resulted in death even among children as most of the consumers do not know the quality of what they are buying or taking (OlikeChinwendu, 2008). Considering the knowledge base of the drug vendors, whose minimum academic requirement to obtain a license is the first school-leaving certificate, they are not in a good position to differentiate between fake and genuine product (Erhun and Adeola, 1995). This situation makes it imperative that there is need to heighten effort in fake drug eradication.

The National Agency for Food and Drug Administration and Control (NAFDAC) among several approach towards the eradication of fake drug employed the use of telecommunication at combatting the menace of fake drug proliferation in the nation. As at May 2012, the Nigerian Communications Commission (NCC) has 118,850,928 connected GSM lines, of which 97,553,425 GSM lines are active [www.ncc.gov.ng). The National Agency for Food and Drug Administration and Control (NAFDAC) planned to leverage on this figure to save Nigerian from the menace of fake drug.

**Mobile Authentication Service: Definition and Presentation**

The Mobile Authentication Service (MAS) works with mobile phones that are SMS enable. It allows individuals with mobile phones to check whether a drug is fake or original without direct contact with the manufacturer.

This service was introduced into Nigeria by National Agency for Food and Drug Administration and Control (NAFDAC) in response to the increasing rate of fake drugs sold in this country. It is an attempt to turn mobile phones into mobile tools that can help check this problem as many lives have been claimed and many are still endangered by the circulation of such fake products.

The Mobile Authentication Service (MAS) uses Truscan Technology which enables Consumers to enter a twelve digit number printed on the back of the packaging of a drug and send it via SMS to a dedicated number which automatically sends a Negative or Positive responds about the genuineness of the product before it is purchased.

This service was made possible through a partnership between National Agency for Food and Drug Administration and Control (NAFDAC), GSM operators as well as representatives of national and international pharmaceutical companies in the country. A sponsor and partner is BIOFEM which provides sproxil Technology, the technological solution for the anti-counterfeiting service.

**How Does NAFDAC MAS Work?**

This is a very simplified step by step method of verifying the authenticity of any drug via mobile phone. It can be applied just at the point of purchase of a product by the consumer.

Step 1:

Scratch the sproxil label on the product to be purchased to reveal a unique 12 digit PIN.

Step 2:

Text the Unique 12 digit PIN as SMS to the short code 38353.

Step 3:

Immediately receive a response in form of SMS on your phone affirming the validity of the PIN either positively or negatively.

With the support of all mobile network providers in the country this service is available in all corners of the country. It is free of charge once the phone is SMS enable.

The National Agency for Food and Drug Administration and Control (NAFDAC) and other stakeholders in the drug and food administration sector of the country, encourage pharmacists to help consumers who are not literate to check the originality of the product with their own phone.

**The MAS Experience in Nigeria**

The National Agency for Food and Drug Administration and Control (NAFDAC) on February 2, 2010, launched the NAFDAC Mobile Authentication Service (MAS) with the aim of putting the power of checking for originality of product in the hands of consumer. The National Agency for food and Drug Administration and Control (NAFDAC) has made compulsory the implementation

of MAS by all Pharmaceutical companies for all their major products especially the Antibiotics and the Antimalarial drugs. The official deadline for implementation was set for 2nd of March, 2013. It is hoped that this directives will be implemented and definitely allow Nigerians to check the authenticity of their medicines and eliminate fake drugs from circulation. To date it is clear that out of every 200 Nigerians one knows about MAS. Well over a million text messages have been sent by Nigerians and millions of products now carry the unique sproxil label to show that such product is MAS ready (sproxil.com/mas.html). GlaxoSmithKline in partnership with National Agency for Food and Drug Administration and Control (NAFDAC) in February 2011, run a six months pilot anti-counterfeiting programme in Nigeria. In all a total of 145,000 texts from 115,000 unique users was received. This figure represents approximately 10% of use from the total products send out for the pilot programme. Ninety percent of text returned a genuine confirmation, 2.5% received a counterfeit alert and other received a message indicating a duplicate PIN.

**Consequences of Counterfeit Medicines**

The consequences of counterfeit medicines can generally be divided into two main areas.

The first are economic effects for the pharmaceutical industry, health assurances and the national health systems and also the patients.

The second would be the more important direct health threats that the counterfeits can have for the patient and for medical treatment in general.

These areas are of course overlapping as health threats burdened on the patients also generate a major part of the economic effects for the other stakeholders.

**Economic Consequences for Health Systems and the Society**

Direct and indirect costs appear for the economic effect related to the patient. The direct costs include everything concerning prevention, diagnosis and treatment of counterfeit related diseases, e.g. when patients need certain drugs to fight the effects caused by the counterfeit, if they need hospitalization or when their hospital stays are prolonged.

Indirect costs include the costs for the loss of productivity of the patients that fall ill, stay ill or even die because of counterfeits.

The countries affected by counterfeits can furthermore lose taxes and import/export duties as these are seldom paid by counterfeiters.

**Economic Consequences for the Pharmaceutical Industry**

The pharmaceutical sector also has to bear a considerable economic burden because of counterfeit medicines. The companies are forced to investigate on the field of counterfeit medicines and take actions against them. Recalls have to be done in the legal supply chain when counterfeits compromise certain batches of pharmaceuticals. Confiscated counterfeits have to be destroyed, often at the costs of the holder of rights.

Higher costs lead to lower investments and less innovations, further lowering the economic potential of pharmaceutical companies.

The brands and respectively the brand owning companies suffer from the damage of their reputation damaged by counterfeits which can lead to loss of market share and to the need for increased advertising efforts.

If counterfeits are detected in the legal supply chain, not only the pharmaceutical companies are less trusted, also retailers and pharmacies can lose market share and profits.

**Economic Consequences for the Patients**

As said before there are also economic effects for the patient. Apart from the effects of the over- or under dosed products, ineffective or even toxin-contaminated counterfeit, the enforcement of consumer rights is of course not at all secured with illegal pharmacies. Furthermore the Internet consumers risk their money due to pre-payment and the anonymity of the Internet.

As the costs for the pharmaceutical industry rises with the prevalence of counterfeit medicines the patients will also have to pay higher prices for legal drugs. In addition, illness or prolonged illness is often associated with a loss of income for the patients.

**Consequences for Patient's Health**

The consequences for the patient's health due to the use of counterfeit medicines can be manifold. Therapeutic failure, drug resistance and even death are possible as direct or indirect effects of their use. The type of health effect that a counterfeit has depends on its type. As described in the definition chapter at the beginning there are many possibilities a counterfeit can be made.

**Under dosing**

Under dosing can lead to therapeutic failure with all related consequences and especially with anti-invectives also to microbial resistance against the API.

**Overdosing**

An overdose leads to an elevated risk for serious side effects.Both under- and overdoses can also happen when the formulation of the drug is altered by the counterfeiters, e.g. the originator has a slow release formulation whereas the counterfeit is immediately released.

**No API**

If no API is used therapeutic failure will be the result and the medical condition of the patient might not improve or even get worse.

**Switch to another API**

If APIs are exchanged by counterfeiters not only the risks for under- and overdosed medicines apply, furthermore the 'new' API can have unexpected serious side effects.

**Toxic substances**

If toxic substances are included as fake APIs of course the toxic effects are the most apparent problem. Furthermore they will have no therapeutic effect. Inferior Production of counterfeit production most counterfeits, even if they contain the correct amount of the correct API, are not produced according to pharmaceutical standards. Therefore all problems associated with insecure production like contamination with unwanted substances, microbial contaminations etc. are possible.

A successful penetration of the legal supply chain also undermines the credibility of national health and enforcement authorities.

In the following sections some examples should be given for concrete health threats that happened in different parts of the world.

## 2.5 Important of the Study

**Safety:** Drug use can impair a person’s judgment and increase safety risks. This is especially concerning in certain industries, such as construction, in which using drugs or alcohol at work could cause an injury or even a fatality. As employee drug abuse causes as much as 50% of all on-the-job accidents this is not a matter

to be taken lightly. Plus, drug testing can improve the quality of life of employees and their families.

**Performance:** Workers under the influence of drugs may struggle to stay on task, letting their minds drift toward problems that aren't related to their work. Drug testing allows employers to target those employees who aren't reaching their full potential due to illicit drug use, removing weak links and improving their company's performance overall.

**Productivity & Profits:** Substance abuse or addiction can lead to missed deadlines and decreased attendance. Dwindling productivity will result in lower profits as well—after all, if your company isn't producing work at a steady rate, how can you expect to maintain consistent profits? Finally, it's important to note that drug abuse also causes up to 40% of employee theft an additional drain on profits.

**Turnover Rates:** Pre-employment drug testing is a great way to find employees who fit your company's goals and standards. In addition, it reduces the likelihood that you will have to fire a new employee down the road, allowing you to retain valuable workers and decrease your turnover rate.

**Medical Costs:** Substance abuse can dramatically increase a person's medical costs. In fact, business owners lose an estimated $140 billion annually due to drug use Workplace drug testing allows employers to decrease their health insurance premiums and health costs by reducing on-the-job accidents and drug-related illnesses. It's a win-win situation, improving the health of employees and reducing costs for employers.

## 2.6 Problems of the Existing System

The major issues with the existing system is due to the stress under gone for the verification of drugs, which at times do not reply the user request for verification. The existing system did not implement the authentication of all the drugs but a few, which gave room for the counterfeit of drugs of those that are not verified. Hence the original cannot be verified, the fake will not be identified. And the existing system is not user friendly as per say. This total made the existing system needs an upgrade or the development of a complete system to replace and solve the issues the previous system cannot solve.

## 2.7 Prospects of the Existing System

- The existing problem has a future prospects since Information communication technology has been introduce to the Nigeria system thereby making records and testing to be done using system instead of manually
- Another prospect leads to this research work that is, the introduction of drug verification using mobile phone rather than going to the laboratory.

# CHAPTER THREE

# SYSTEM ANALYSIS AND DESIGN

## 3.1 Introduction

In this chapter, the outline of the analysis of the existing and proposed system and a guideline for solving the problem, with specific component such as phases, tasks, methods, techniques and tools, problem of the existing system and justification for the new system is presented in this chapter.

## 3.2 Proposed System Methodology

The methodology we applied in this research was an Expert Systems Methodology – ESM

This method is best for security system and network solution software development. The steps are followed are:

1. Identify the problem and design the task.
2. Acquisition of knowledge and problem solving strategies. It involves the knowledge engineer, the domain knowledge expert, the knowledge base and inference rule and then interference engine.
3. Design the inference rules, natural language interferences, rule editor, heuristic search strategies, forward and backward reasoning with rules decision trees.
4. Build and test the proto type expert system operate.

This method is used in the development scheme of the proposed system which we will be model in chapter four of this research work and also implemented in the chapter.

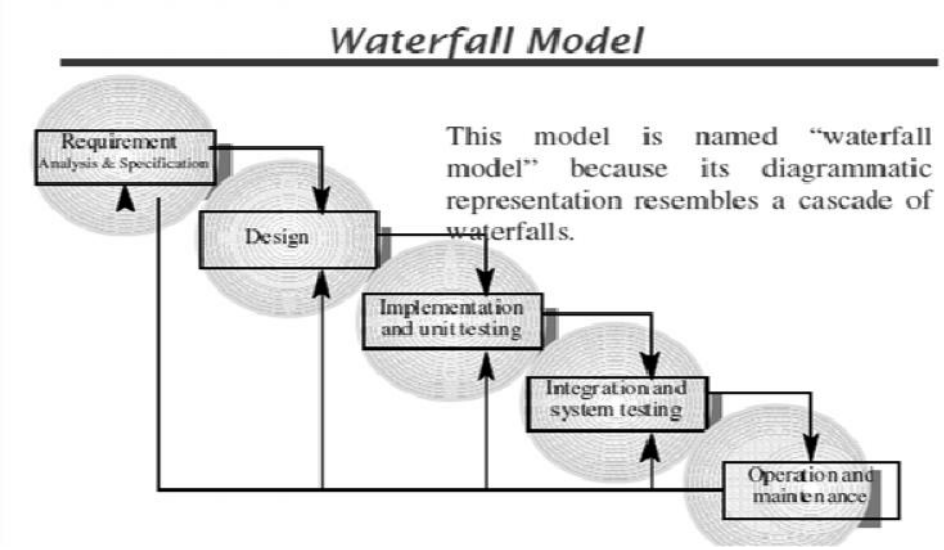



Fig 3.1: A diagram showing the Waterfall Model process

(Source: K.K Aggarwal &Yogesh, 2007. Software Engineering (3rd ed.))

**Design Methodology**

Object-oriented analysis and design methodology (OOADM) is still in its growing phase and continues to evolve. There are more than a dozen popular OOADMs that have been widely circulated, but no single one of them has gained a wide acceptance. The technique we use to construct the formal representation of an OOADM is meta-modeling. Meta modeling has been used to develop theoretical foundations for information systems.

Meta-models are conceptual models of modeling methodologies or techniques. There are two aspects of a systems development methodology: the processes that are the steps with corresponding input and output products and the concepts that are used to construct the representation of the intermediate and final products of the methodology. In structured analysis, for example, the processes correspond to the steps that lead an analyst to build data flow diagrams from requirements specification, and the input and output products are the results of

each analysis step, such as data flow diagrams at different levels. These two aspects, processes and concepts, are analogous to the well-known dichotomy of control and data of software systems.

### 3.3 Benefits of Proposed Over Existing System

- Reduction of record-keeping burden: A software solution that maintains consistency and persistence of entered data can go a long way in reducing the burden of record keeping on laboratory staff.
- Reduced waiting time and more reliable results for patients: When bulk of data maintenance is done by the Laboratory Information System, laboratory technicians can focus on their main task of performing and interpreting tests. This leads to lesser reduced times for patients and to more accurate test results.
- Ability to trace patient and drug history: The manners in which drugs are tested does not ease method of tracing drug. Onthe other hand, an mobile verification enables fast and precise lookup/retrieval of existing data record in the system

### 3.4 Method of Data Collection

In this project research work, there are two main type of data collection, which include primary collection and secondary collection. These two categories of data collection type were used in this research work.

**Primary Sources of Data**

The primary collection which is also known as interview method are the original collection of material or study unit from which information is to be collected on first hand basis through interview, measurement, observation and questionnaire completion. But here the researcher only interviews the director of

NAFDAC and various staffs in reviewing and sharing their experience about the problem of the existing system. Through this; useful information is collected, analysed and recorded.

**Secondary Sources of Data**

The secondary collection is a method whereby the data are collected or obtained indirectly unlike the primary collection. Here the researcher reviews the existing document and forms. Also make use of existing literature, research report, internet downloads, textbooks, magazines, and newspapers in both private and academic libraries including café in order to understand the diagnosis system.

## 3.5 Justification for the New System

The new system justification is on the base that the issues and unhandled situation of the existing system can be achieved in the new system design.

1. Verification of drugs is done at easy with a user friendly interface.
2. All drugs can be verified through the new system.
3. Verification process is secured than ever.
4. Feedbacks and reply is on the fly and go (No delay at all).

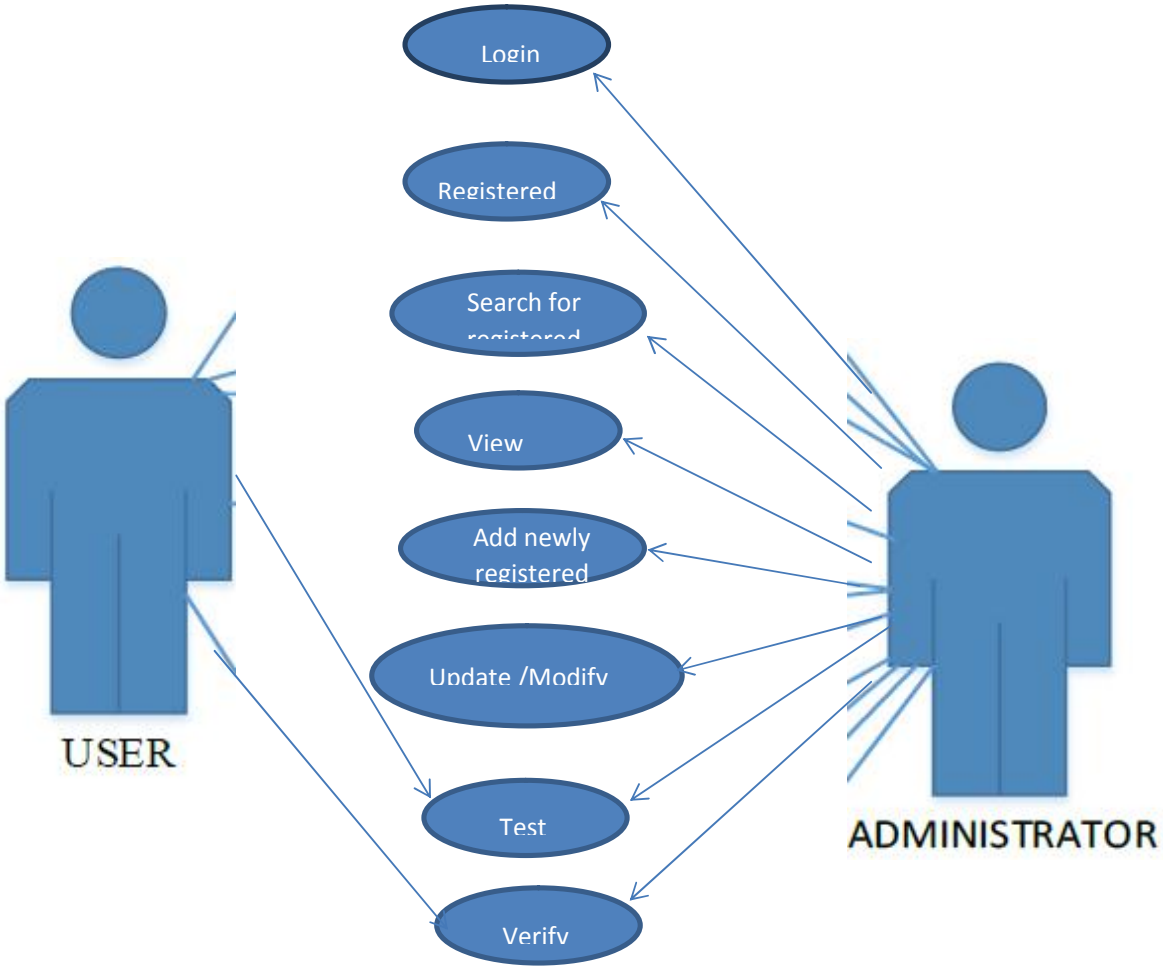
Hence the new system meets with all this demand it was accepted as a replacement to the existing system.

## 3.6 System Modeling/UML Diagram

The new system architectural structure and prototype will be analyzed and demonstrated in graphical layout.

| Use Case | Description |
|---|---|
| Login | The admin enters an assigned user name and a password to have access to the system |
| Logout | An admin who has logged in successfully exits the system at his/her own convenience by pressing the log out button. |
| Search for Registered Drug | The external user can easily search for the registered drugs in the system. |

**Fig. 3.2 Use Case Diagram**



### 3.6.1 System Architectural Model

The system architectural model encompasses different components of the system, technologies and concepts employed, which include, web services technology used to implement other service principles. SDLC principles and software project management techniques were engaged in the development process. Rapid Application Development (RAD) was used the software building process.

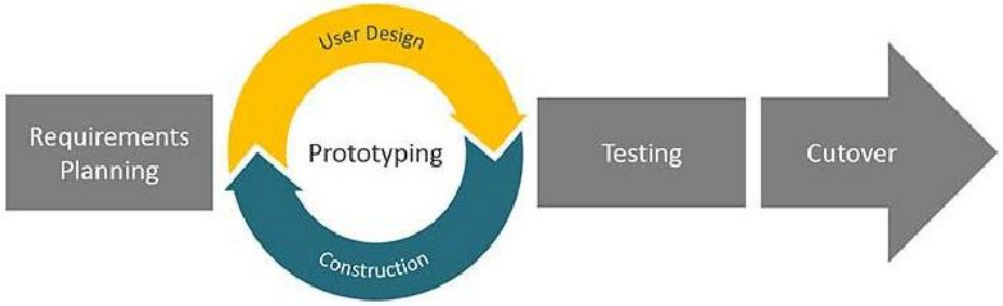



**Fig. 3.3 Stages of the Rapid Application Development**

With the RAD we considered the following:

- Requirements planning phase – we combined elements of the system planning and systems analysis at this phase of the Systems Development Life Cycle (SDLC) as it is a generic standardized approach at this level.
- Discussions and approvals were made on business needs, constraints, project scope, and system requirements.
- User design phase –interactions were made to users so as to meet their needs and also with systems analysts and we develop models and prototypes that represent all system processes, inputs, and outputs.
- Construction phase – We built the application at this phase with more focus on program and application. This covered programming and application development, coding, unit-integration and system testing.

- Cutover phase – A delivery of the built system was made at this phase.

The requirement specification entails adequately defining the functionality of a system and the functionality of the system however was placed in two categories:

- Functional requirements
- Non-functional requirements

• The functional requirements of the system include the following modules:

• UI Layer (HTML5/CSS3/JS/PHP)

• Domain Logic (VB/MySQL)

• Native Implementation

• WAMP / XAMPP: software that serves as a host server on a local machine.

### 3.6.2 System Flowchart

The diagram below demonstrates how data or information runs through the system. The programs accepts input data through the user interface form from the keyboard and send to the control unit where the data is processed by validating it with the central database or the disk and return the record found to the screen also with a print functionality.

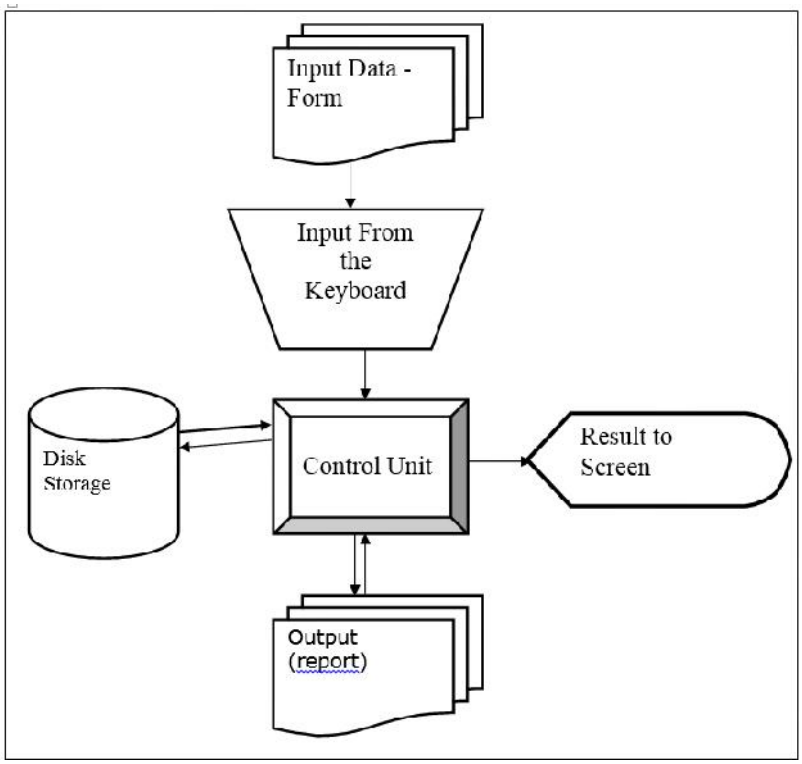



Fig 3.4 System flow diagram

### 3.6.3 System Diagram

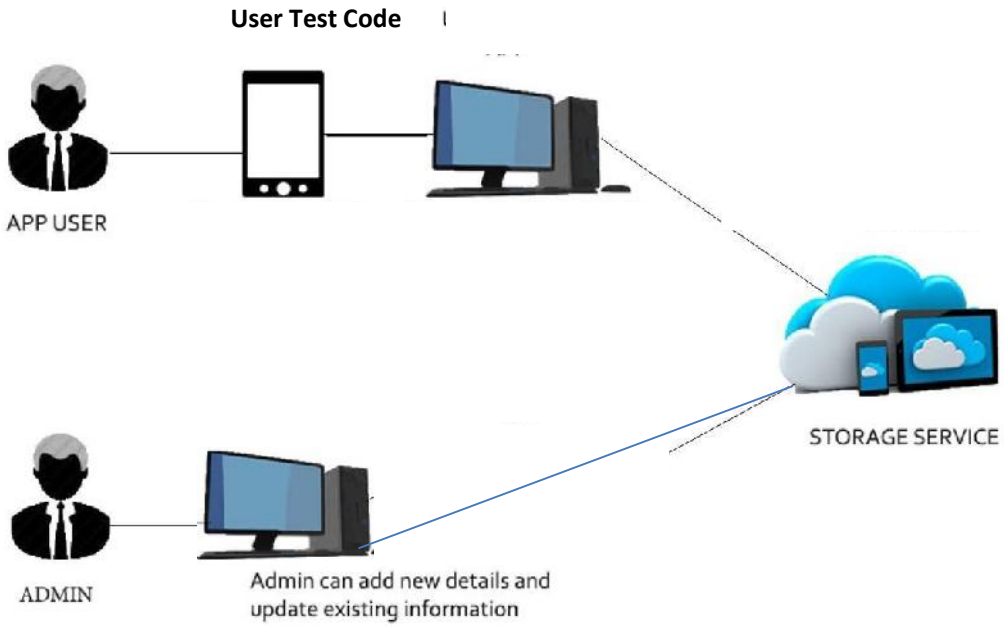



**Fig. 3.5 The System diagram**

- From the above diagram, a user tests the genuineity of the drug on Smartphone or tablet running any mobile operating system. The user can then send the short code of the drug to the database to check pharmaceutical drugs and also verify if the drug is legit to be sold on the pharmaceutical market or not. The user can equally access the application over a desktop computer connected to the internet which then connects to a server for exchange of data and information. The administrator also has a controller application as well as the admin application to sign in to the back end (database).

### 3.6.4 Data Flow Diagram

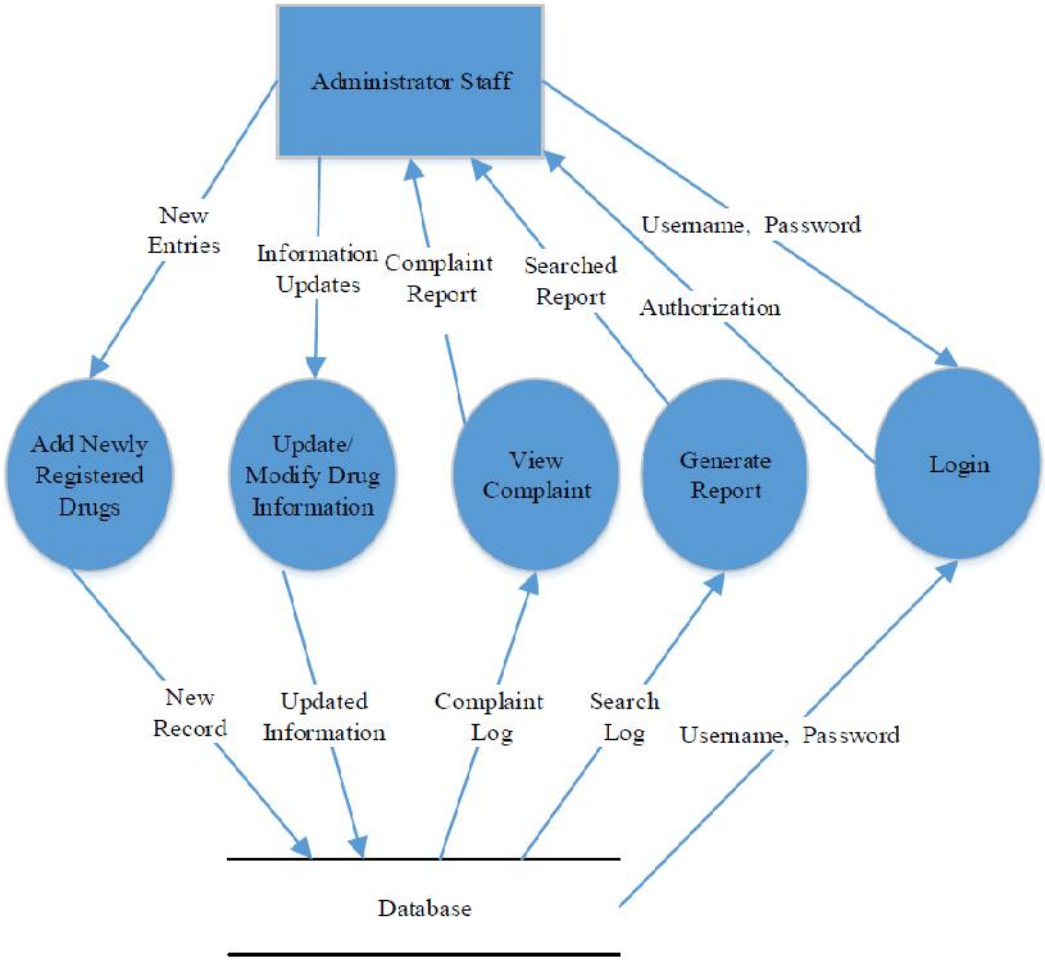



**Fig. 3.6 Data Flow Diagram for Administrator**

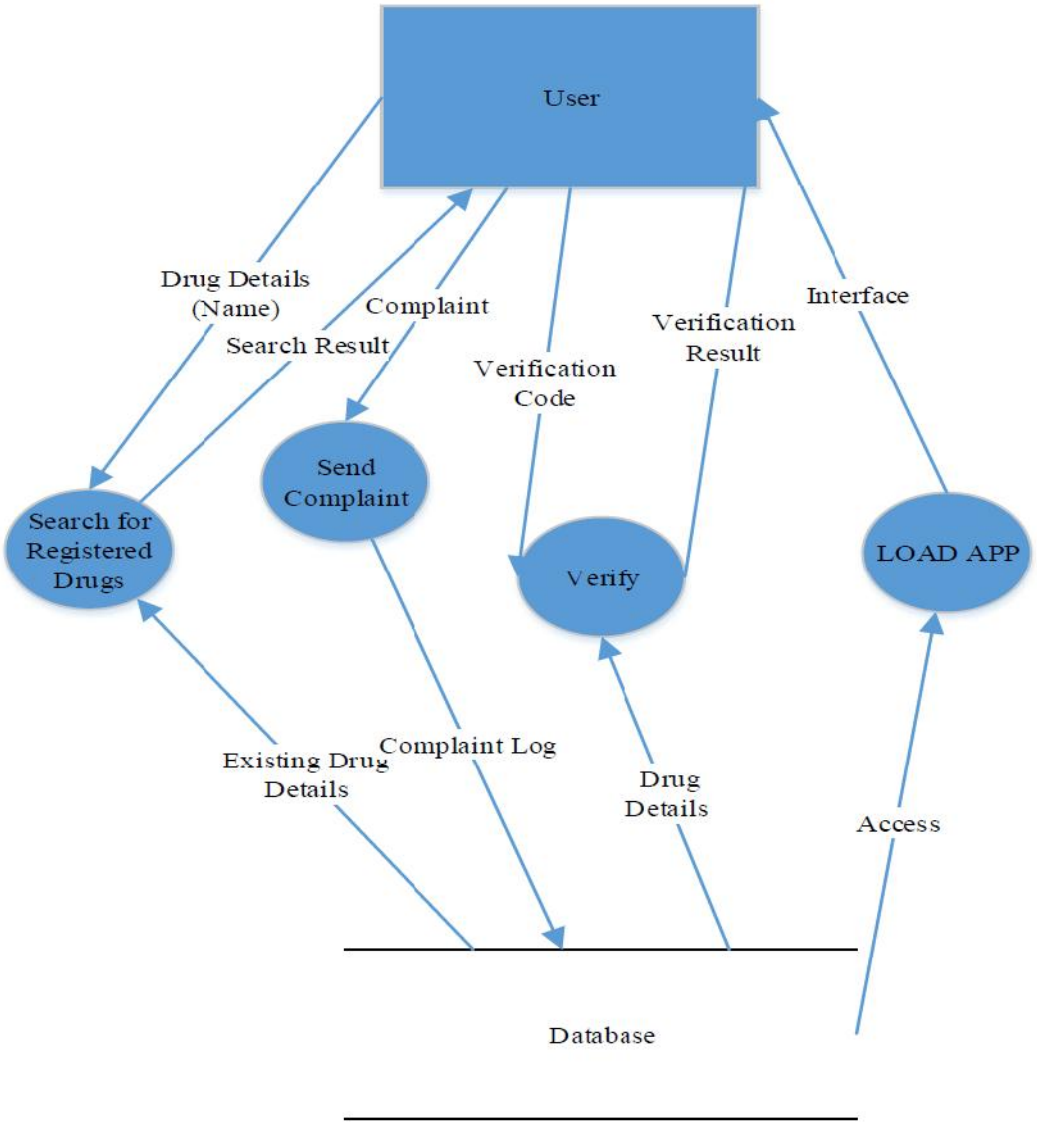



**Fig. 3.7 Data Flow Diagram for User**

The data flow diagram described and analyzed the movement of data in a system. The transformation of data from input, through processing, to output, may be described logically and independently of physical components associated with the system.

**Sequence Diagram**

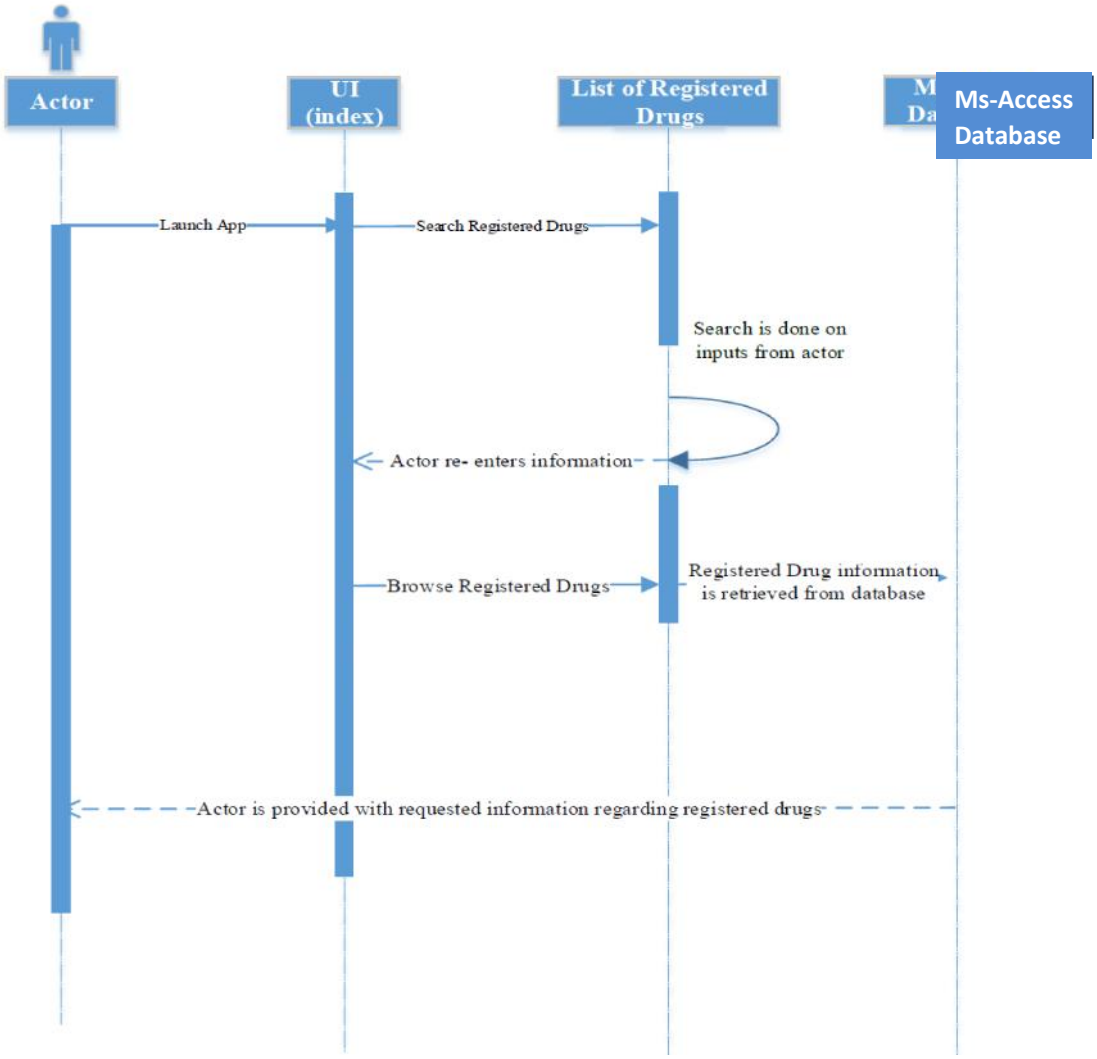
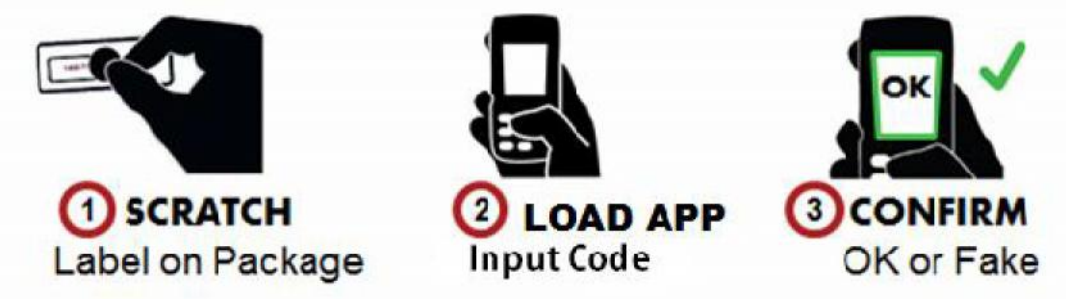



**Fig. 3.8 The sequence diagram**

The sequence diagram modeled the collaboration of objects in this project based on a time sequence. The sequence diagram is a UML standard for presenting objects interacting with one another and it shows how each process interacts with the other and the order in which they interact. This illustrates how a user interacts with the system. An actor represents the system user. When the actor opens the application, the actor is taken to the landing page of the

application, which is the index.html page, basically, the Home page of the application. The actor can then navigate to other pages to retrieve required information.

**Information Flow Diagram**




The diagram above shows how to confirm a drug validity using our application. It's just three steps operation and your verification is completed and reply will be given on drugs authenticity.

**Database Specification And Design**

The database for the new system is design as follows.

| Field name | Data type | Description |
|---|---|---|
| ID | Integer | Holds the identification number of the drugs |
| Code | Char | This field holds the drug code number, and it is unique. This code will be used for verification purposes |
| Production date | Date/time | This fields holds the date at which this drug is produce by the manufacturer |
| Product Name | Char | This field holds the name of the drug |
| Manufacturer | Char | It hold the name of the industry or company that produced the drug |

**Table 3.2:** Drugs Table

# CHAPTER FOUR

# SYSTEM TESTING, IMPLEENTATION& EVALUATION

## 4.1 Introduction

This chapter deals with the system implementation and testing, the new system will be implemented and tested on different platform to evaluate its test or working performance, the new system will be tested using the mobile device the GSM devices. The implementation process and testing will be discussed here; program choice and system requirement too will be discussed.

Ajav AT (2011), implementation is the final phase in the SD2C is the implementation phase, during which the system is actually built (or perched, in the cause of the packaged software design). This is the phase that usually gets the most attention, because for most system it is the longest and most expansive single part of the development process.

## 4.2 Implementation Details

This is where all the result of this of project work is implemented; this phase consists of source code (see Appendix II), together with documentation to make the code more readable. The software does not only have to be considered from the point of view of logistics functionality but from the technical perspective.

The programme was implemented on a laptop with window 7 operating system, and run over the network to check its connectivity and functionality.

The whole of the system was tested and found proven to be of the expectation required, and every other units were also tested, the compatibility was tested, the platform on which it runs, the system connectivity and system security

## 4.3 Program Language Justification

Visual programming language is used for the implementation of the application and this is because that's the only program language that can be used to develop GSM device application and its reach features and these including the following.

1. It is a high level programming language
2. It also support procedural and objects or enters programming language.
3. Have many in built functions.
4. Easy manipulation.
5. Flexibility.
6. It supports network application.
7. It supports mute programming.
8. Its functions and controls are designed to easily fascinate programming.
9. It runes almost on all android device in the market place.

Likewise, the development environment used for this work is eclipse Suna version which happens to be the latest version of the eclipse.

## 4.4 Systems Requirement

After the development of the required application and test running it the, the application have some basic requirement and feature which must be meet before the application can run on such device, this requirement are in two group.

### 4.4.1 Hardware Requirement

This is the aspect concerned with the physical component of the mobile device needed for the effective operation of the new system designed. The software will run well with a mobile device with the under listed hardware specification:

- Dual cord 100 MHZ or compatible or higher
- 100MB phone memory disk space minimum
- 152MB RAM (recommended minimum)
- 0.5GB MB RAM (recommended)
- 1GB Memory space (recommended)

### 4.4.2 Software Requirement

This aspect specifies the various events the proposed system would be able to perform the user's perspective in order to ensure a good and working system.

The following are the software needed for the smooth running of the package

- Microsoft office2003 and above
- Visual Basic 6.0
- Internet Access.

## 4.5 Procedure Testing Plan

Below are the descriptions and testing phase of each from (model) and dialogs (sub modules) in the DVI System class as contained in the program:

### 4.5.1 Welcome Module

The welcome module is just a splash screen that appears while the applications initializes or load its content before starting the main activity of the application.


**Fig 4.1**: Welcome module

### 4.5.2 The Verification Module

This module allows the user to enter the code of the drug which is the production code number and send by clicking the verify button and a reply back on the product authentication will be returned immediately.


**Fig 4.2:** Verification Module

### 4.5.3 Verified Module

This module handles the entire return query from the DATABASE, which is the verification of the requested drugs. If verified it returns the information about the drug and production details but if not returns a feedback that tell you the drug is not valid therefore, it is fake.

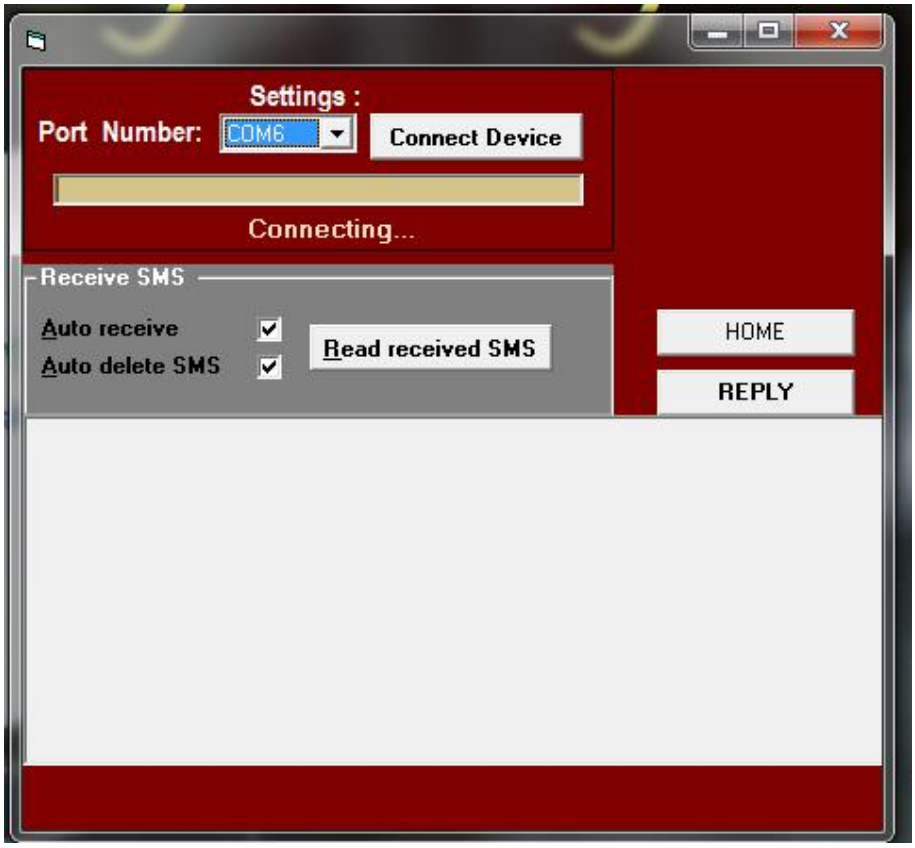



**Fig 4.3**: Verified module

**Technical Issues Encountered**

Some of the technical issues and questions we encountered were with the following:

- How the program saves data
- How errors are detected and the error messages that should appear
- Is the software user friendly?
- Is the Graphic User Interface elegant?

We were able to answer and resolve these issues after a careful study and research and discussions with the drug verification agency.

## 4.6 Results Evaluation

The 2022 statistics from ITU indicates that has mobile penetration rate is on the increase. This increase has been made possible by mobile usage; the increase rate now shows that more people are getting access to the internet through their mobile devices. This shows that the market is ready for the type of product that the group has been developed.

Prototyping was extensively used by the team in developing the client application. The first iteration of the prototype which is called "mVerify Alpha" builds. Subsequent prototyping iterations is called “mVerify Beta" builds was used to resolve the issues and to bring performers closer to the final build. The second prototype that was designed for consumers to verify their pharmaceutical drugs whether is registered was based on Mobile SMS.(This build allowed users with smart phones running any mobile operating system verify if a pharmaceutical drug package attached with a sticker unique code is keyed into the field given will show the results after a click.

### 4.6.1 Adequacy and Coverage

The DVI system software can perform the following functions

1. Verify Drugs validity information
2. Search for drugs and see their validity
3. Print report on each search or operation

### 4.6.2 Efficiency and Effectiveness

1. The DVI system software verifies drug directly from the server, the manufacturer's database and return search results.
2. The end users can make a search for other related drugs for its validity using the app search button.

## 4.7 Limitation of the Study

The challenges of implementing this system and its cost are details below.

**a) Diversity of Pharmaceutical Industry**

Nigerian Pharmaceutical drugs comes mostly from the Indian Pharma industry, having more than 20,000 registered units which are highly fragmented with severe price competition and government price control. There are approximately 250 large units and more than 8,000 small and medium scale units, which form the core of the Pharmaceutical industry in India. The large units are highly qualified technically as well as professionally. On the other hand, the medium and small manufacturers will not afford to implement this system a drug verification information system (DVI system). So this will be a core challenge to the implementation of this system.

**b) Implementation of method for unique identification of the product**

Here are various active and passive technologies available like RFID, 1D or 2D Bar Codes, Hologram, Forensic taggants - Optical taggants , Micro-particle

taggants (nanotaggants) etc. To implement a robust and effective solution to achieve both objectives 'Drug Authentication' and 'Verification', there was a need of globally accepted solution for uniquely identification of the product which is easily accessible, less space consuming for printing and cost effective for its all three levels of packaging namely Primary, Secondary and Tertiary. Primary is the package which is in direct physical contact with the active ingredient, Secondary is the carton containing one or more primary packs including a mono carton containing one primary pack and Tertiary means a shipper containing one or more secondary packs.

**c) Financial Implications and over heads for the manufacturers**

The financial implications and investment for the implementation of the system was major concern of the Pharma Industry especially for small and medium scale manufacturers in the country.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Summary

The Drug Verification was developed to be tested on any phones and implemented successfully.

We identified two key factors and these are:

- Easy to use user interface design on both server and mobile application.
- Fast and seamless application feedback.

These systems underpin all the activities of drug toasting system by providing good health care and safety. It also provides fast access to drug information and the current status of the drug can be obtained from the database files unlike the manual system.

This can be applied by using mobile phone to determine the effectiveness of drug stock control, it helps in making quick decision by users whether to use the drug or not.

Furthermore enhancement should be made on drug testing by developing on a mobile application for easy testing.

## 5.2 Conclusion

The global counterfeit problem is still on the rise. It was discovered that, when a good relationship is developed between drug product manufacturers, consumers and the government, it would lead to a successful implementation drug verification systems. The system is designed to be beneficial to all stakeholders and there is a need for it to be standardized for identifying drug products. Drug labels are supposed to be tagged or coded with standardized IDs in centralized and open system systems that are made easily available for different devices such as Mobile Phones, SMS Gateway, Laptop and Desktop Computer.

## 5.3 Recommendations

Recommendations of this application to all the manufacturers in any production line as to help their clients and patronize verify their product upon usage. This will give confidence to the customer that the product brand he is using is actually the original from the expected manufacturers.

The main aim of this project was to put what we learnt in our Software engineering class into practice. The DVI system designated to me was to fully exercise the techniques of XP. The final deliverable was a simple operating DVIsystem and was able to learn a new programming languages, Visual Basic 6.0, ASP.NET. In addition, I was able to apply the knowledge of OOP learnt in our Visual Basic classes to another language thereby giving us a better understanding of OOP, so I want to use this medium and say to all my fellow computer science and engineering student to put their efforts in programming or other related and meaningful aspect of computation in computer science.

## REFERENCES


Akunyili, Dora (2004): "Fake and counterfeit drugs in the health sector: The role of medical doctors." Annals of Ibadan Postgraduate Medicine 2.2 19-23.Counterfeit Trade: Assessing Customs Support for UN.

Bate, Roger. (2008):"The Deadly Implications of the Counterfeit Drug Trade".s.l The AEI Press, 2008.

Cockburn, Robert; et al. (2005): "The Global Threat of Counterfeit Drugs: Why Industry and Governments Must Communicate the Dangers." PLOS Medicine. Bd. 2, 4, S. 302-308.

Gaudiano, Maria Cristina, et al., et al. (2007): "Medicines informal market in Congo, Burundi and Angola, counterfeit and sub-standard antimalarial." Malaria Journal. Bd. 6, 22.

Gostin, Lawrence O., and Gillian J. Buckley, eds. (2013): "countering the problem of falsified and substandard drugs". National Academies Press.

Home, W. H. O. "12.3 RECOMMENDATIONS FOR EFFECTIVE DRUG

http://de.wikipedia.org/wiki/Pedanios_Dioscurides

http://www.smithsonianmag.com/people-places/the-fatal-consequences-

Jack, Andrew. (2007): "BITTER PILLS" BMJ. Bd. 335, S. 1120-1121.

John Irish, June 10, (2010):"Customs group to fight $200 bln bogus drug industry," Reuters, Andrew Marshall, Smithsonian Magazine,

Kogan, Vladimir, et al., et al. (Feb 2008): "Detection of counterfeit drugs in blister packs by angle dispersive X-ray diffraction." EP 2 090 883 B1. European Patent DE FR GB NL, 15.

Nelson, Maria, Vizuragga, Michelle und Chang, David. (2006): “Counterfeit Pharmaceuticals: A Worldwide Problem”. The Trademark Reporter. Bd. 96, 5, S. 1068-1100.

Newton, PN, Green, MD und Fernandez, FM (Feb 2010): “Impact of poor- quality medicines in the ’developing’ world.” Trends Pharmacol Sci.

of-counterfeit-drugs-139422027/#ixzz2thLfEyxu

REGULATION. http://www.changemakers.com/system/files/mPedigreeOnePager.pdf

Ruparelia, Nayan B. (2010): “Software development lifecycle models”. ACM SIGSOFT Software Engineering Notes 35.3 (2010): 8-13.

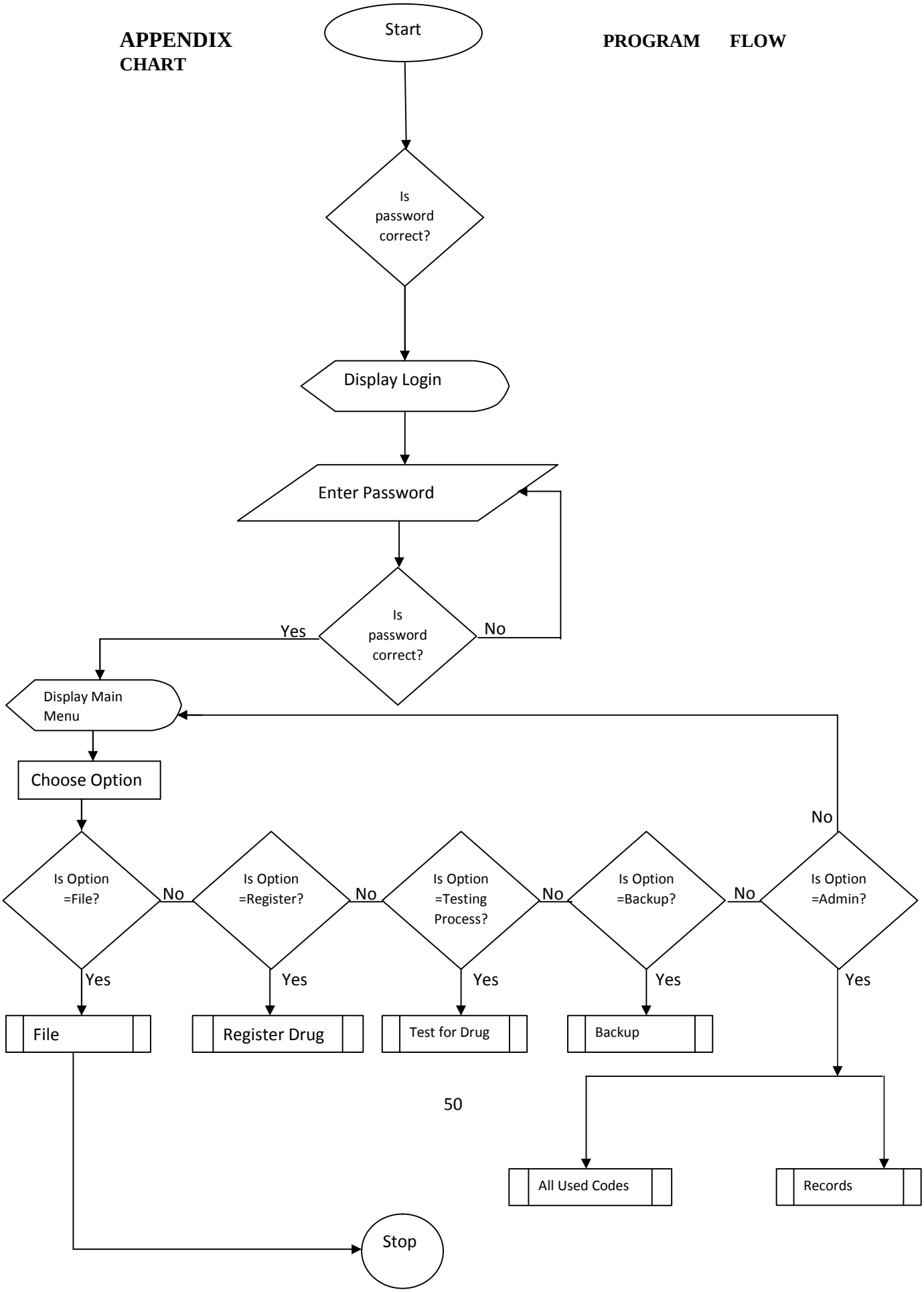
W.H.O. (2010): “Preliminary draft survey on national legislation Counterfeit Medicines”.

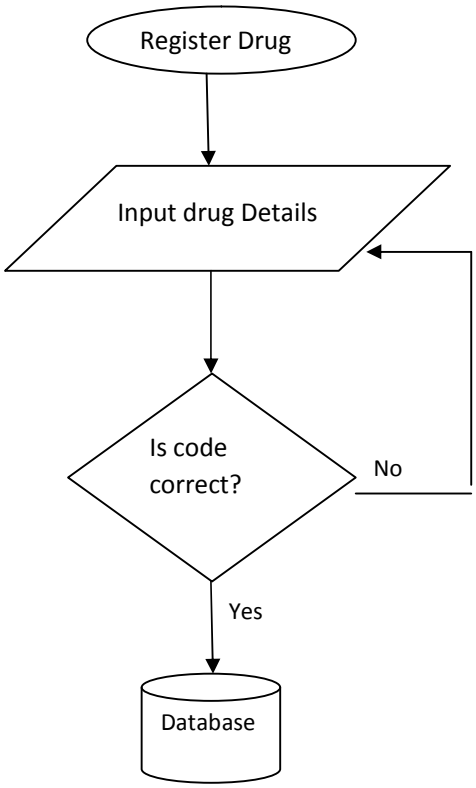
W.H.O. Counterfeit Drugs (1999):“Guidelines for the development of measures to combat counterfeit drugs.” Geneva, Switzerland.

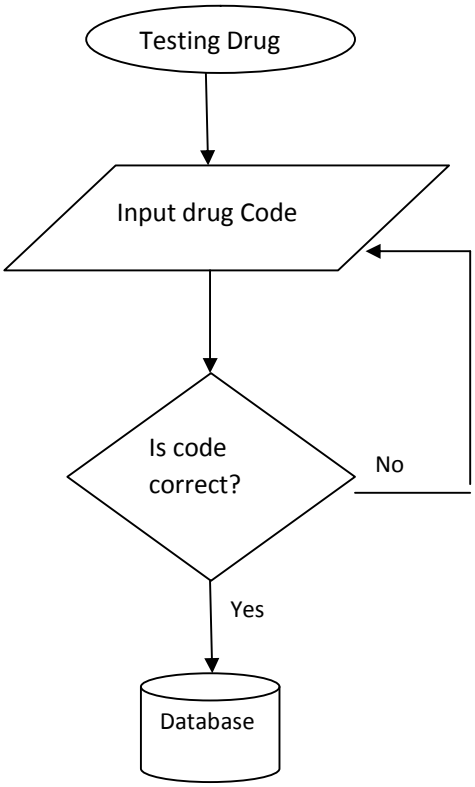
Wikipedia.PedaniosDioscurides. [Online] [Cited: 18 March 2011.]

Yen, David C., and William S. Davis (1999): "Rapid application development (RAD)." The Information Consultant’s System Handbook: System Analysis.

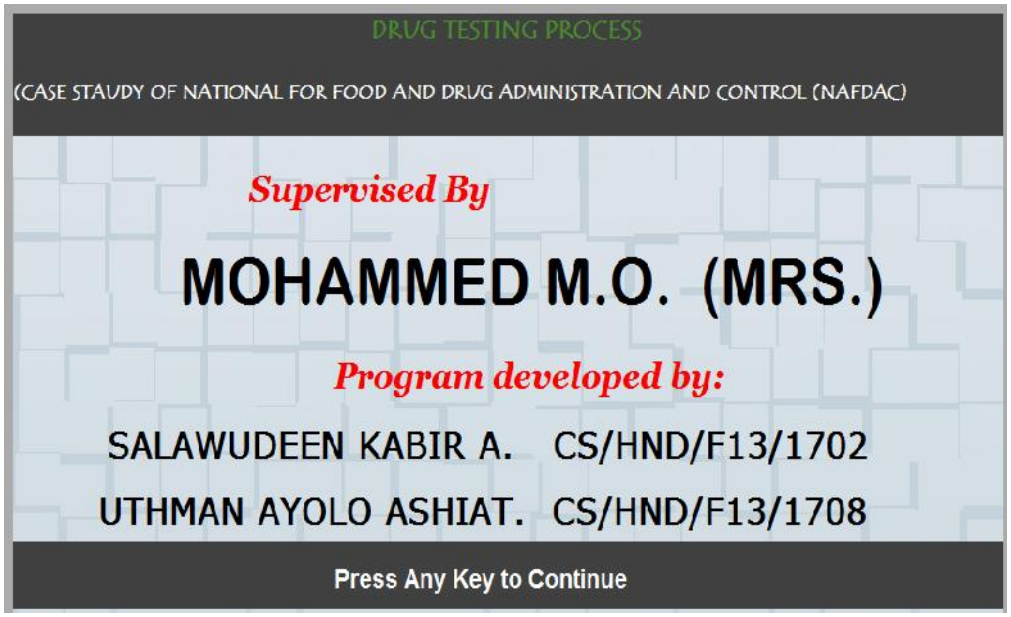
**APPENDIX** **PROGRAM FLOW CHART**



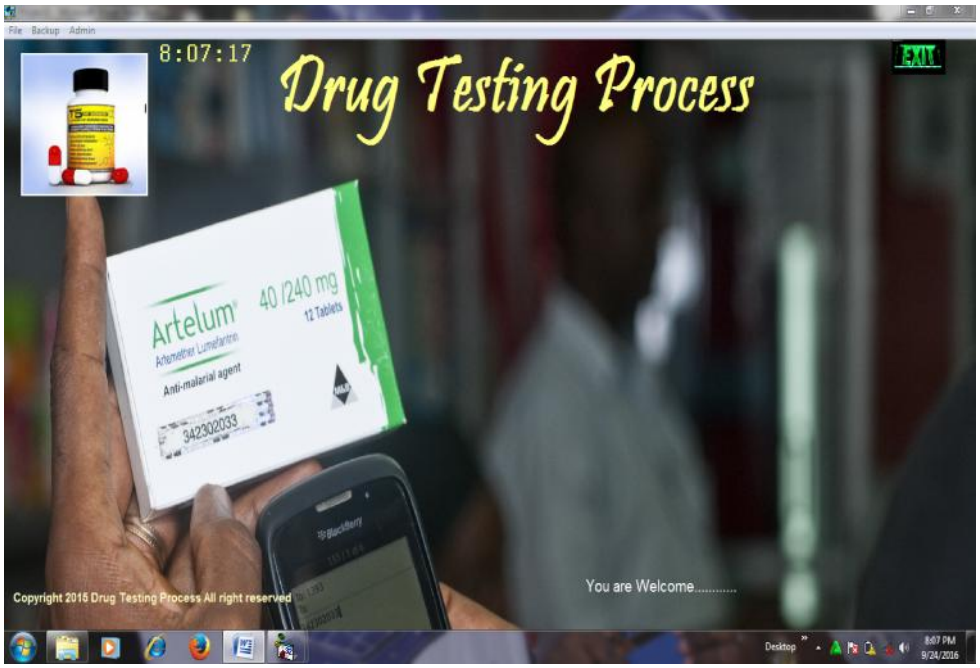

Register Drug
Input drug Details
Is code correct?
No
Yes
Database

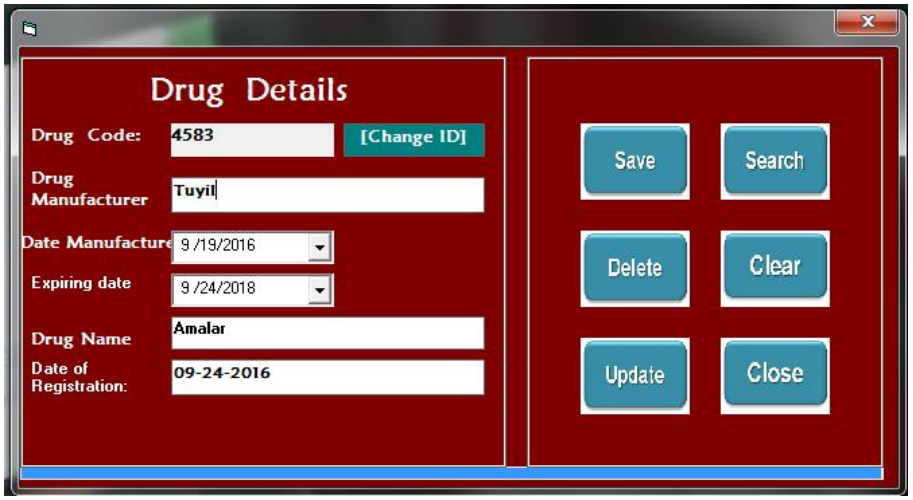

Testing Drug
Input drug Code
Is code correct?
No
Yes
Database

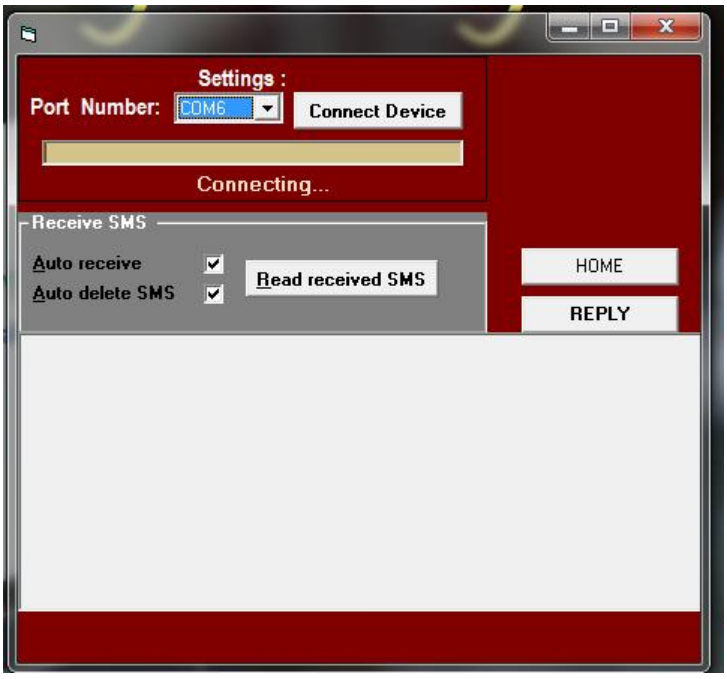
**PROGRAM INTERFACE**

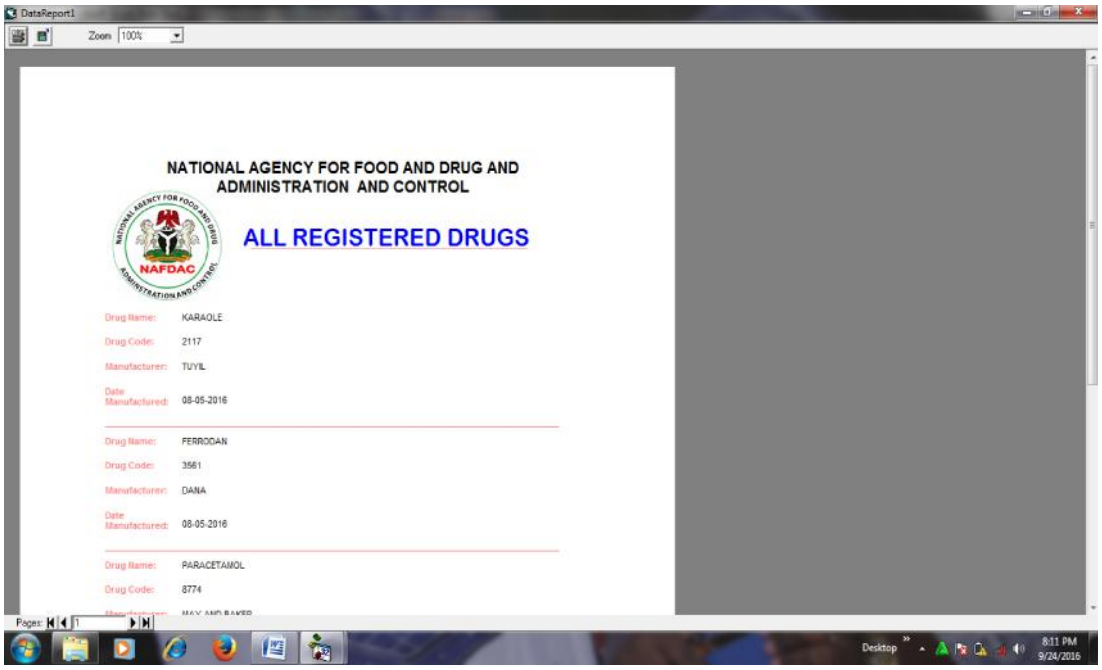

Enter Password:


8:07:17
Drug Testing Process
EXIT
Artelum
40 /240 mg
12 Tablets
Anti-malarial agent
342302033
You are Welcome.....
Copyright 2016 Drug Testing Process All right reserved


Drug Details
Drug Code:
4583
[Change ID]
Drug Manufacturer
Tuyil
Date Manufacture
9 /19/2016
Expiring date
9 /24/2018
Drug Name
Amalar
Date of Registration:
09-24-2016
Save
Search
Delete
Clear
Update
Close


Settings :
Port Number:
COM6
Connect Device
Connecting...
Receive SMS
Auto receive
Auto delete SMS
Read received SMS
HOME
REPLY


Back up Database
Back up Destination
C:\
Destination
Backup
Cancel


DataReport1
Zoom 100%
NATIONAL AGENCY FOR FOOD AND DRUG AND ADMINISTRATION AND CONTROL
NAFDAC
ALL REGISTERED DRUGS
Drug Name: KARAOLE
Drug Code: 2117
Manufacturer: TUYIL
Date Manufactured: 08-05-2016
Drug Name: FERRODAN
Drug Code: 3561
Manufacturer: DANA
Date Manufactured: 08-05-2016
Drug Name: PARACETAMOL
Drug Code: 8774
Pages: 1
Desktop
8:11 PM
9/24/2016

# SOURCE CODES

```
Option Explicit
Dim logcount As Integer
Dim countertitle As Integer
Dim title As String
Dim titledance As String
Dim CounselorID As Long
Dim dbasize As Long
Dim Pathfulname As String
Private Sub cmdbackup_Click()
If txtdestination <> "" Then
DoBackup Pathfulname, txtdestination
 MsgBox "Backup Successfuly ", vbInformation
ElseIf txtdestination = "" Then
  MsgBox "You must specify a distination for the backup", vbCritical
End If
End Sub
Private Sub cmdCancel_Click()
    Me.Hide
   FrmSplashScreen.Show
End Sub
Private Sub cmddestination_Click()
Dim strTemp As String
strTemp = fBrowseForFolder(Me.hwnd, "Select backup path")
If strTemp <> "" Then
    txtdestination = strTemp
End If
End Sub
Private Sub Form_Load()
```

```
title = "Welcome to Drug Testing Procedure System"
Pathfulname = App.Path & "\code.MDB"
dbasize = FileLen(Pathfulname)
End Sub
Private Sub SetRegion()
   On Error Resume Next
   If hRgn Then DeleteObject hRgn
   hRgn = GetBitmapRegion(Me.Picture, RGB(255, 0, 255))
   SetWindowRgn Me.hwnd, hRgn, True
End Sub
Private Sub Form_Unload(Cancel As Integer)
  End
End Sub
Private Sub Timer1_Timer()
titledance = Left(title, countertitle)
Me.Caption = titledance
countertitle = countertitle + 1
If countertitle >= Len(title) + 3 Then
   countertitle = 1
   titledance = ""
End If
End Sub
Private WithEvents Modem As SMSModem 'use WithEvents for detecting events raised
by the modem
Dim msgRef As Integer
Dim SentCount As Integer
Dim dbs As Database
Dim rss As Recordset
'=================data==============
```

```
Dim mycon As ADODB.Connection
Dim myrec As ADODB.Recordset
Dim myrec1 As ADODB.Recordset
Dim STATMM, constr As String
'=============================================
Private Sub connecting()
constr = "provider = microsoft.jet.oledb.4.0; Data Source =" & App.Path & "\code.mdb"
End Sub

Private Sub chkAutoDelete_Click()
Modem.AutoDelete = True
End Sub
Private Sub chkAutoReceive_Click()
If chkAutoReceive.Value = vbChecked Then
If Modem.Status <> smsModemClosed Then Call cmdOpenModem_Click
Else
End If
End Sub
Private Sub CMDLO_Click()
Unload Me
FrmSplashScreen.Show
End Sub
Private Sub cmdOpenModem_Click()
'On Error GoTo DonsolErr:
If cmbPort.Text = "" Then
MsgBox "Please Select Modem Port Number", vbInformation, "No Port Selected"
Exit Sub
End If
Dim Portno As String
```

```
Dim Pcount As Integer
Portno = cmbPort.ListIndex + 1
'MsgBox Portno
  CommPort = Portno  ' COM1:
   Set Modem = New SMSModem
     Call Modem.OpenComm(gsmModemHuawei, CommPort, , smsNotifyAll)
   cmdOpenModem.Caption = "Connected"
   While Pb.Width < 4215
Pb.Width = Pb.Width + 1
DoEvents
Wend
   lblNotify.Caption = "Connected"
   tmr.Enabled = True
DonsolErr:
End Sub
Private Sub cmdReceive_Click()
Dim messages As Collection, msg As SMSDeliver
   Set messages = Modem.ReadReceivedMessages(False, (chkAutoDelete = vbChecked))
   '// Print to report
   If messages.Count = 0 Then
      'lstReport.AddItem "No messages received"
   Else
      For Each msg In messages
         Modem_MessageReceived msg
         chkAutoDelete_Click
      Next msg
   End If
End Sub
Private Sub Command1_Click()
```

```
TmrSaveInfo.Enabled = True
Timer1.Enabled = True
End Sub
Private Sub Command2_Click()
'On Error Resume Next

If lstReport.ListCount = 0 Then
'MsgBox "invalid"
Exit Sub
End If
'================================
Dim ReplyMsg As String
Dim ReplyNo As String
Dim ReceiveCode As String
lstReport.Selected(0) = True
ReplyNo = lstReport.List(lstReport.ListIndex)
ReceiveCode = lstReport.List(lstReport.ListIndex)
ReplyNo = "0" & Right$(ReplyNo, 10)
ReceiveCode = Left$(ReceiveCode, 4)
MsgBox ReplyNo & "  Code :" & ReceiveCode
Dim mat As String
With rss
.FindFirst "ID='" + ReceiveCode + "'"
If .NoMatch = True Then
ReplyMsg = "WARNING!!! THIS DRUG IS NOT A GENUINE DRUG REPORT TO THE
NEAREST NAFDAC OFFICE."
MsgBox "NOT FOUND >>>FAKE DRUG<<<", vbCritical
End If
If .NoMatch = False Then
```

```
ReplyMsg = ("THE DRUG" + "  " + !Drug_name + " WILL EXPIRE ON " + !Date1 + " IS
GENUINE DRUG YOU CAN USE IT (NAFDAC)")

MsgBox "YOU CAN USE THE DRUG", vbInformation

End If

End With

'================================================

  msgRef = Modem.SendTextMessage(Trim(ReplyNo), ReplyMsg, True)

  ' MsgBox txtMessage, , "Message #" & CStr(msgRef) & " sent to " & txtDest

'Sleep 300

SentCount = SentCount + 1

lstReport.RemoveItem (0)

'lblCount.Caption = SentCount

'lblNumber.Caption = SentCount

Call Command2_Click

'=========delete from database===========

'Call connecting

'Set mycon = New ADODB.Connection

'mycon.Open (constr)

'mycon.Execute sql

'STATMM = "DELETE* FROM Drug_reg WHERE ID='" & lstReport.Text & "'"

'mycon.Execute STATMM

'mycon.Close

End Sub

Private Sub Form_Load()

Dim i As Integer

'Set Cnn1 = New ADODB.Connection

'Set Rs1 = New ADODB.Recordset

Set dbs = OpenDatabase(App.Path & "\code.mdb")

Set rss = dbs.OpenRecordset("drug_reg", 2)
```

```
SentCount = 0
For i = 1 To 60
cmbPort.AddItem "COM" & i
Next i
End Sub
Private Sub Form_Unload(Cancel As Integer)
On Error Resume Next
Call Modem.CloseComm
  Set Modem = Nothing
End Sub
Private Sub Modem_MessageReceived(message As SMSDeliver)
lstReport.Clear
lstReport.AddItem message.Body & " " & message.Originator
  'MsgBox message.Body, , "New message from " & message.Originator
End Sub
Private Sub Modem_StatusReport(statusRpt As SMSStatusReport)
lstReport.AddItem "Status report for message #" & CStr(statusRpt.MessageRef) _
    & " sent to " & statusRpt.Destination _
    & ": " & statusRpt.MessageStatusName
End Sub
Private Sub Timer1_Timer()
Command2_Click
End Sub
Private Sub tmr_Timer()
cmdReceive_Click
End Sub
Private Sub TmrSaveInfo_Timer()
CmdProcess_Click
End Sub
```