Integrated System for Vehicle Clearance and Registration

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Abstract: Efficient management and control of government's cash resources rely on government banking arrangements. Nigeria, like many low income countries, employed fragmented systems in handling government receipts and payments. Later in 2016, Nigeria implemented a unified structure as recommended by the IMF, where all government funds are collected in one account would reduce borrowing costs, extend credit and improve government's fiscal policy among other benefits to government. This situation motivated us to embark on this research to design and implement an integrated system for vehicle clearance and registration. This system complies with the new Treasury Single Account policy to enable proper interaction and collaboration among five different level agencies (NCS, FRSC, SBIR, VIO and NPF) saddled with vehicular administration and activities in Nigeria. Since the system is web based, Object Oriented Hypermedia Design Methodology (OOHDM) is used. Tools such as Php, JavaScript, css, html, AJAX and other web development technologies were used. The result is a web based system that gives proper information about a vehicle starting from the exact date of importation to registration and renewal of licensing. Vehicle owner information, custom duty information, plate number registration details, etc. will also be efficiently retrieved from the system by any of the agencies without contacting the other agency at any point in time. Also number plate will no longer be the only means of vehicle identification as it is presently the case in Nigeria, because the unified system will automatically generate and assigned a Unique Vehicle Identification Pin Number (UVIPN) on payment of duty in the system to the vehicle and the UVIPN will be linked to the various agencies in the management information system.

Keywords: Vehicle Clearance, Vehicle Registration, Treasury Single Account

1. INTRODUCTION

1.1 Background to the Study

The International Monetary Fund (IMF), recommended a unified financial policy for funds flow in Nigeria. Treasury Single Account (TSA) is a financial policy in use in several countries all over the world. It was proposed and partially implemented by the federal government of Nigeria in 2012 under the Jonathan Administration - and fully implemented by the Buhari's Administration to consolidate all inflows from all agencies of government into a single account at the Central Bank of Nigeria. Efficient management and control of government's cash resources rely on government banking arrangements. Nigeria, like many low income countries, employed fragmented systems in handling government receipts and payments. Establishing a unified structure as recommended by the IMF, where

all government funds are collected in one account would reduce borrowing costs, extend credit and improve government's fiscal policy among other benefits to government. The IMF also recommends the establishment of a legal basis to ensure its robustness and stability. The introduction of the Treasury Single Account policy therefore was vital in reducing the proliferation of bank accounts operated by ministries, departments and agencies (MDAs) towards promoting financial accountability among governmental organs. The compliance of the policy in Nigeria created challenges for majority of the MDAs. Commercial banks in Nigeria remitted over 2 trillion Naira worth of idle and active governments deposits with full implementation of this policy in 2016. Meanwhile, the bankers' committee of the country has declared their support for the policy. Through Remita, the integrated electronic payments and collections has enabled the Federal Government of Nigeria to take full control of over 3 trillion Naira ($15 billion) of its cash assets as at the end of the first quarter of 2016. The ongoing motivated the design and implementation of an integrated system that will unify all payments and collections involved in vehicle clearance and registration. The growth in computer technology development is increasing as long as more research are performed on daily basis. Information technology improvement has gone versatile over the world on different application in every country. Advancement in technology comes with the need for individuals and organizations to harness the power of information technology to make their duties easier. In this research, attention is given to how information technology can be harnessed to automate vehicle clearing and registration in Nigeria. Vehicle and plate number registration in Nigeria has been in existence for the past decade ago and the document have been manually operated which in turn has not helped to raise the efficiency of general automotive services in recent years. additionally, there are multiple documents issued by many agencies to a particular vehicle. This situation opens more gap for fraud since an officer from one agency cannot

verify the authenticity of a document issued by another agency at any point in time. So, we propose an integrated system where proper interaction and collaborations will be created among the agencies saddled with vehicular administration and activities in Nigeria. These agencies are: Nigeria Customs Service (NCS), Federal Road Safety Commission (FRSC), Vehicle Inspection Office (VIO), States Boards of Internal Revenue (SBIR) and Nigeria Police Force (NPF). The system will also be required to give proper information about a vehicle starting from the exact date of importation to registration and renewal of licensing. Vehicle owner information will also be efficiently retrieved from the system by the Nigerian police when a crime is committed with such vehicle. Officers from any agency can verify vehicle documents issued by other agencies by visiting the unified web application. Also number plate will no longer be the only means of vehicle identification as it is presently the case in Nigeria, because the unified system will automatically generate and assigned a unique UVIPN (unique vehicle identification pin number) on prompt payment of duty in the system to the vehicle and the UVIPN will be linked to the various agencies in the management information system. Lastly, the system will also incorporate a vehicle maintenance alert menu which will regulate and timely alert vehicle owners when such vehicle is due for servicing to avoid vehicle breakdown. In this research work, a lot of observation have been conducted towards the existing application system in use that prompts various problems in processing data in order to identify the various problems that are been encountered in the registration of vehicles and plate number.

The proposed application system will allow automatic change of ownership when a vehicle is disposed through the vehicle and plate number registration code generated. The online registration site will also incorporate Nigeria Customs Service (NCS) for importation and clearing of the goods and direct it to Federal Road Safety Commission (FRSC). One unified web application is developed and all the

information about a vehicle can be found on the website irrespective of the agency that issued the command.

1.2   The Statement of the Problem

The existing vehicle registration and plate number issuance system were analyzed and the following problems were found. They are:

a. The agencies involved in vehicle certification operate independently with different software systems under separate domains and servers. This situation hinders fast verification of documents.
b. The existence of uncertainty regarding whether the treasury will have sufficient funds to finance programmed expenditures may lead to sub-optimal behavior by budget entities, such as exaggerating their estimates for cash needs or channeling expenditures through off-budget arrangements.
c. Participation of unauthorized officers in the vehicle clearance and registration process.
d. There is delay in verifying the authenticity of vehicle documents because there is no online system where the information is stored.
e. Wrong charging of fees and exploitation by registration of officers.
f. Difficulty in tracing a record/information concerning a vehicle owner due to improper information keeping as a result of carelessness or volume in the size of the record kept.
g. Car buyers have reportedly been victims of deceit because there is no way these ones can confirm whether a particular vehicle with a particular engine number has been cleared of custom duty.
h. Loss of files and human error have led to denial of payment by licensing agencies.
i. Illegal extortion of funds by agents who are also officials of vehicle registration agencies.
j. Improper accounting of registration transactions.

These problems among other have motivated the construction of the new system.

1.3   Aim and Objectives of the Study.

The aim of this research is to design and implement a multipurpose online vehicle clearing and registration system. The specific objectives of this research are:

a. To simplify vehicle clearance and registration by integrating the procedure on one platform.
b. To build an integrated web application that will host the functions of all agencies that are involved in vehicle registration and licensing. All information and procedures will be constructed on one website.
c. To build an integrated system that facilitates efficient payment mechanism for vehicle clearance and registration.
d. To create a system that improves operational control during budget execution. When the treasury has full information about cash resources, it can plan and implement budget execution in an efficient, transparent, and reliable manner.
e. To develop a notification system for vehicle owners using sms and email on every registration process.

1.4   Significance of the Study

The new system will be of great significance because it will expedite the efficiency of principal licensing officers in the processing of vehicle registration data and documents online processing. The proposed web application will also improve the confidence of Federal Road Safety Commission (FRSC) and Vehicle owners since it produces accurate information timely. The new system will also develop a method that will allow easy storage and retrieval of vehicle and owner's registration information and online assessment at any time in the future. A highly accurate method of generating and assigning plate numbers will be featured. This will determine the easiest and fastest way to access vehicle owner's plate number, registration information and missing vehicles through the code generated. Officers on duty will not require original documents anymore. Instead documents can be verified on the website with an internet enabled device. Integration and single account will improve appropriation control. The TSA attached to the

web application ensures that the government has full control over budget allocations, and strengthens the authority of the budget appropriation. When separate bank accounts are maintained, the result is often a fragmented system, where funds provided for budgetary appropriations are augmented by additional cash resources that become available through various creative, often extra-budgetary, measures.

2. LITERATURE REVIEW

2.1   Vehicle Clearance

The Comptroller-General of Customs, retired Col. Hameed Ali (2017), on Tuesday announced a code number for efficient and effective vehicle duty clearance verification. Ali disclosed this at a media stakeholders meeting in Abuja.

Ali (2017) said that the essence of the meeting was to have a roundtable with stakeholders to come up with solution to avoid causing hardship to Nigerians in regards to duty payment on old vehicles and verification. He said that customs had taken further step to ensure that Nigerians, who wanted to verify the authenticity of their customs duty clearance, could do so at the comfort of their homes with the use of their mobile phones.

"For effective and easy customs duty clearance verification, you can dial or send SMS to these numbers 094621597 with your vehicle C-number, the year you paid the duty and the port or location where the vehicle came through into the country. "Immediately all that information is given, just in five minutes you will get a response whether your vehicle duty clearance is genuine or not,'' Ali said. He said the essence of the numbers was to ensure stress free verification, to motor dealers and innocent Nigerian vehicle owners.

According to him, for easy traffic flow, the last number which is 7 in the digits 094621597 can be either changed to 8 or 9, to get response faster with different customs personnel on duty

at every point in time. Ali said that Nigerians misunderstood customs intention regarding duty payment on old vehicles, adding that the excise was actually meant for motor dealers.

He added that customs later decided to give innocent private vehicle owners, who after verification, might find out that their vehicles had no genuine duty clearance to take advantage of the 60 per cent rebate.

2.2   Vehicle Registration - AUTO REG

Auto-Reg. is an automated vehicle Licensing and Renewal system in Nigeria. It is a proprietary web based business solution developed by Coulterville Business Solutions PLC, to address the inefficiencies of the motor-vehicle administration system in Nigeria. However, Auto-Reg. succeeded in helping government generate accrued revenue by using a designated banking system for payment of tax and licensing fees but never solved the problem of security and inspection of vehicles. In Auto-reg., vehicle license is to be renewed annually and the system was designed to show the details of vehicle and expiration of licenses but has not addressed the issue of duty evasion, identification of theft vehicle by the police and above all the unification of all the agencies saddled with the responsibilities of vehicular activities in Nigeria for proper collaboration. Since the commencement of Auto-Reg., over one hundred thousand (100,000) cases of number plate duplications in the system have been discovered in Nigeria. (The nation newspaper, Nov. 2014) Auto Reg was deployed first in Lagos State in (February 2007), Oyo (June 2008), Delta (Jun, 2008), Anambra (Mar 2008), Abia (Dec 2008), Rivers (Jan 2009), Enugu (Sept, 2008), Niger (Oct, 2009), Kebbi (Nov, 2009), Borno (Jan, 2010) and Sokoto (Jan, 2010).

2.3   Federal Road Safety Commission.

 The FRSC responsibility is to design and produce vehicle number plates by virtue of Section 5(g) and Section 10 sub section 3(f) of

the Federal Road Safety Commission (Establishment) Act, 2007. After production, the number plates are handed over to the State through State Board of Internal Revenue (SBIRs) who now sell to the public. Nigerians have berated the FRSC for its handling of motor vehicle registration across the country, describing it as "cumbersome" and "exploitative." In July 2009, the FRSC planned to restore the integrity of Unified Licensing Scheme (ULS) and National Vehicle Identification Scheme (NVIS), they also planned to maintain a credible database of all drivers in Nigeria and to develop a robust Information and Communication Technology (ICT) network. Indeed, the FRSC was one of the earliest federal agencies to embrace ICT. The idea behind ULS was to unify vehicle and driver licensing in Nigeria in order to create a national database so that authority/personnel would have instant access to vehicle or motorist's records. Drivers sex, height, blood group, disability, health status etc. similar scheme has long operated in developed and even developing countries with positive implication for road safety management and crime control.

In 2011, The Federal Road Safety Commission in conjunction with the Joint Tax Board (JTB), commenced the issuance of new Number Plates in an attempt to harmonize all existing modes of licensing vehicles nationwide. This according to the Corps Marshall and Chief Executive is part of the commission's strategy towards restoring order and sanity in the nation's Motor Vehicle Administration Scheme. To this end FRSC introduced an Enterprise System called National Vehicle Identification System (NVIS) which is a unified system designed to automate the processes involved in the Number Plate Production and Vehicle Registration. NVIS is open to members of the public who are Vehicle Owners as well as representatives of States, Federal Ministries, Departments and Agencies. (http://nvis.frsc.gov.ng/). The NVIS incorporated only SBIR, VIO and FRSC.

Driver's license remains a huge racket for road safety officers, revenue officials and the touts that litter licensing offices. Adeniji, K. (2013), hitherto, urban transport problems are becoming more and more acute in the cities in Nigeria

(Badejo Dele, 2013) summarized Features of Urban Transport System in the Nigerian cities, 95% of urban trips are by road. Out of this, about 70% of the urban trips are made by public transport. Inter modality of trips is limited to public transport journey by road based public transport. Ownership and organization of road public transport systems are characterized by haphazard and uncoordinated operators. Complete absence of comprehensive and integration of urban mass transit public transportation system. According to Torres Martinez, A. J (2001) due to poor condition of city roads which in turn shortens life span of motor vehicles and high cost of maintenance. Filani (2002) noted that the country has the lowest level of motorization in West Africa with four vehicles per 1000 inhabitants. To compound the problem further, the rate of vehicle growth is much lower than the population growth rate. Resulting from this mismatch is a general fall in the level of motorization in all parts of the country. Since 1982 and up till 1989/1990 there was a substantial reduction in new vehicle registration in all parts of the country. Olanrenwaju (2013) classified transportation infrastructure as one of the hard infrastructure that are basic, physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function effectively.

2.4   The Need for Technologies for Collecting Vehicle Registration Data.

Hogan, J.O. (2015) in a study conducted in discussing the effectiveness of police computer use and the problems that exist with the use. It was found in that study that the respondents in forty-four cities across the United States view computers as a major force in the fight against crime. This too could be applied in Nigeria if properly established and managed. According to the Minister of Finance, Mrs. Kemi

Adeosun, who disclosed this in a workshop in Abuja titled "FG TO USE TECHNOLOGY TO TACKLE SMUGGLING" noted that the country was losing billions of naira annually to the activities of smugglers and described the technology system as a powerful tool against the illicit and dangerous practice. She also said that there is a need to introduce technology as a platform that provides a form of identity for each vehicle that will be linked to proof of ownership and connected to a centralized database. She added that the programme was also expected to significantly boost vehicle security and ease of transfer of vehicles from one owner to the other. (The Punch Newspaper, 2017).

A variety of technologies have been tested and used by many law enforcement agencies in Nigeria. The technologies used in data collection and processing include a variety of systems such as Mobile Phones, optical storage disks, portable computers, and digital cameras. The current computer technologies allow shareholders to pay their collection/renewal bills at the designated banks or existing offices, electronically transfer the payment to the state agency account and provide deposit slips for the collection of receipts at the state agencies. The use of online error checks, and subsequently the needs for reentering Vehicle detailed data are not inevitable. At the beginning, these devices seem to be the best solution to all the registration problems because it tackles the issues of payment of vehicles registration dues into the government's account. However, it still has its limitation, as they have not met up with the demands to the masses that spend endless time anxiously waiting for their demands to be met at the Licensing/Commission offices. Hence, the full computerization has not been effected as expected while technology and software programming has advanced in other countries. Shall we continue to wait for the criminals to get away with our stolen vehicles? Shall we keep spending endless time waiting on queues in which have been divulged are corrupt practices of officials based on personalities? Shall we spend endless time searching for owners of whose vehicles have been recovered when software can be developed to tackle such problem like these? The merit of automation is far reacting more than just saving time and holding down persons cost, automating gives vehicle management the means to truly streamline the vehicle registration processes. Automating manual processing tasks allow registration officers eliminate duplicate data entry, move towards a completely paperless environment and process multi - day function, emphasizing the use of technology in vehicle registration. Zhang, Y., Zhang, J., and Chen, J. (2016), opinion was that "in developing computerized system which can help vehicle licensing officers and offices to automatically register with ease, so that the process becomes an automatic day – to – day operation. The solution can help motor licensing officers and offices to improve registration by automating the manual based process, error caused by manual interventions can be reduced and electronic process support enables faster processing time. Meet regulatory demands Archive, email and documentation so that it is easily accessible, usable and quickly retrievable for legal demands. By reducing the administrative burden of paper management and error prone and repetitive data entry in the existing system. For a computerized system to work efficiently and effectively, a strong and reliable database is needed. According to Microsoft encyclopedia, database is a structured format for organizing and maintaining information that can be easily retrieved. Data is stored in a computer in such a way that the computer can easily retrieve and manipulate the data. A collecting of records describing information resources usually computerized. According to Ahmed Suleiman T. (2006), "there are many reason for vehicle registration, take for instance, if you just bought a vehicle and completed all the registration requirement and you are given your vehicle license, then on your way back from the village, you were attacked at gun point and the vehicle snatched from you, you

reported to the nearest police station and if you are lucky, your vehicle will be found". It would be difficult for you to get your vehicle within a short period because of the existing system. According to Balogun, Segun A. (2006), states that in his Road Safety Practice in Nigeria that "the method of vehicle and plate number registration and identification has caused a lot of people pains, a pregnant woman died on the queue in her quest for vehicle registration." According to Dr. Ikechukwu David N. (1995), states that "our vehicle registration offices today are faced with potential rise and inefficiencies associated with manual i.e. paper based processes which are costly, prone to error and require mental and manual labor. Heightened regulation in the country is also placing these vehicle owners under pressure to meet litigation needs".

According to Oyeyemi, B O. (2003), states in his Stand in Road Traffic Administration states "the level of tediousness the system of vehicle registration and administration in Nigeria is so alarming that requires a new modified method that will be easy and simple." According to Manager E T. (2000), "most vehicle owner finds it difficult to register their vehicle on time due to the manual process which consumes time. For you to register your vehicle within a short period, you need to know one or two persons in the licensing office. This factor is peculiar to most Nigerian offices". According to Bishop, M (2003), vehicle crime accounts for a quarter of all recorded crime; it costs over £3 billion a year and causes immense distress and inconvenience to its victims to track their records. That is why there is need to setup a national target of reducing vehicle crime by 30% over the next five years in Nigeria. According to Dr. Marcellina Hembadoon A. (2006), "the vehicle plate number is very important because it is an identification mark that distinguishes vehicle from each other. It shows the country a vehicle belongs".

2.6 The Importance of Computer Usage in the Registration.

Computer plays vital role in the development of any company it also saves some of its complex problem that is been faced by man and processes voluminous data within a short period of time or at an incredible speed. Recent emphasis on information and data processing in most of our business has grown adversely as in the case of motor vehicle license and plate registration. In as much as motor vehicle registration has been in existent for ages now, the old system of registration has been in adoption which did not play a significant role on highway safety until the development of the new system of vehicle registration where a reflective sheeting which is more visible to read even in the dark. This new system of motor vehicle and plate number registration, which is the main focus of this project, came into existent on the 19th March 1997 and handled by the motor licensing officer. It was introduced to enforce strict compliance to traffic rules and regulation as well as providing a proper data as to the behavior of road users. The roles, which the introduction of computer system will play in this function, will about more efficiency, effectiveness and improve competence. "The FRSC responsibility is to design and produce vehicle number plates by virtue of Section 5(g) and Section 10 sub section 3(f) of the Federal Road Safety Commission (Establishment) Act, 2007. After production, the number plates are handed over to the States through States Boards of Internal Revenue (SBIRs) who now sell to the public." Nigerians have berated the FRSC for its handling of motor vehicle registration across the country, describing it as "cumbersome" and "exploitative."

"To register a vehicle, an applicant is expected to go to the Motor Licensing Office of the State Board of Internal Revenue (SBIR) where he would be guided on the process and procedure of vehicle registration. Alternatively, the applicants can apply online by visiting www.nvisng.org and fill form, submit the form, after which an item number will be automatically generated which will be taken to SBIR for necessary payment. The applicant will then be issued with necessary

vehicle documents. These are Vehicle License, Certificate of Road Worthiness, Valid Insurance Certificate and Proof of Ownership Certificate. Binding classification advice can only be given by the Office of Regulations and Rulings. The importer submits a letter describing the product in detail and provides a sample to the CBP Information Exchange, National Commodity Specialist for a ruling. The importer generally receives a response within 30 days. While tariff classifications are binding, duty rates are not. The object is to promote import compliance, uniformity and accuracy in classification of products. The importer should keep in mind that the Binding Ruling Program is just that- binding. Once CBP issues their decision, it is legally binding and enforceable by law. While the initial ruling may be protested, once a decision is finalized it must be incorporated into the importing process. When submitting a ruling request, include the names, address and other identifying information of all interested parties including the manufacturer. Identify the ports in which the merchandise will be entered and provide a detailed description of the transaction. It always helps to submit a sample of the product when practical. Transport system represents a major interface between the location of activities and the general movement of people in an urban system (Ayeni, 1998).

Hitherto, urban transport problems are becoming more and more acute in the cities in Nigeria (Ogunsanya, 2002; Oyesiku, 2002; etc.) World Health Organization (2000) recently articulated that health concerns related to traffic and transportation have become a worldwide phenomenon and will likely become more of an issue in the future. Findings from other recent studies suggest that stress from transportation may represent an important factor that influences the well - being of urban population (Asiyanbola, 2004; Gee and Takeuchi, 2004). The trend of urbanization and city growth in developing countries are characterized by rapidity of urban increase, urbanization outpacing industrialization, and a high rate of urban

population growth by natural increase and migration (Oyesiku, 2002). In Nigeria, urbanization has a fairly long history in its growth and development. Historical account shows that extensive urban development in Nigeria predates the British colonial administration. Early explorers, missionaries and merchants estimates of population of towns show the existence of substantial human settlements in this part of the world in the 19th century (Mabogunje, 1968). During this period, the major factors crucial to the growth and development of cities were trading, marketing and administration.

3. THE PROPOSED SYSTEM

3.1 Analysis of the New System

The purpose of the new system is to create a multipurpose platform that will facilitatet all the procedures by all the agencies in one web application. The new system is a client–server computer program in which the client (including the user interface and client-side logic) runs in a web browser. On importation, the vehicle owner registers the vehicle engine number and chassis on the web application. Other details that will be provided on the registration page for custom duty requires, personal details, Certificate of Entry, Payment Schedule, Engine Number, Receipt of Purchase, Terminal Delivery Order, Vehicle Releasing Invoice, passport photograph and photo of the vehicle. The custom officers at the administrative side of the web application will review the application and also check the vehicle information registered during importation. If verifications are successful, payment gateway will be generated for the user to pay online. Once payment is confirmed, payment confirmation documents will be printed from the website. These documents will acknowledge that the payment was actually made. The user can also request that the document be delivered at home with little additional charges. With the custom duty paid, the applicant can proceed to the SBIR page on the same website. On the SBIR section, the user will input the chassis number

of the vehicle and then the system will verify if custom duty has been duly paid. If paid, the applicant can proceed, else the system will redirect the applicant to the custom duty page. After successful payment of the custom duty, an applicant must visit SBIR section. Here he applicant will be required to provide details of his driver's license. The name on the driver's license must be name that will be used in the registration. The picture of the driver's license (front and back sides) will be uploaded too. If the verification is successful, then the user can proceed to SBIR else, the user will be redirected to FRSC section to obtains a driver's license. To obtain a driver's license, the applicant must register at the FRSC section and pay online through the web application. After payment, the application proceeds to FRSC office for driving testing. If the applicant's driving ability is satisfactory, biometric data is captured and temporary driver's license will be issued. After some weeks, the applicant will be contacted for the permanent copy. If the applicant already has a driver's license, the application can proceed with registration on the SBIR section on the web application. On the SBIR section, the applicant will provide custom duty serial number, driver's license number and also fill the allocation of plate number form online. After completion of the form, the applicant will make payment online through the web application. After payment, the applicant must take the vehicle and the payment details to any Vehicle Inspection Office (VIO) so that the vehicle will be physically inspected. After successful inspection, the Vehicle Inspection Office (VIO), will issue verification code that will be used to finish registration on the website. Once verified, all documents and information will be forwarded to Nigerian Police section. The Nigerian Police will stamp and conduct a final verification. After the final verification, Proof of Ownership Certificate (POC), Vehicle Identification Tag (VIT), Vehicle Number Plate and other documents are sent to the nearest SBIR office from the address the applicant provided.

The system also allows an applicant to pay for registrations all at once. To do bulk registration, the applicant will visit 'Bulk Registration' Section. The applicant will select registrations desired and web payment page will be displayed. After payment, a payment code with chassis number will be generated. The applicant will use this printout to visit FRSC, VIO, and finally SBIR for collection of Proof of Ownership Certificate (POC), Vehicle Identification Tag (VIT), Vehicle Number Plate and other documents. Additionally, these documents can be renewed online.

The new system will be used to retrieve information about a particular vehicle using only the chassis number of the vehicle. An officer on the road can check from the web application if a vehicle has been cleared by all other agencies: NCS, FRSC, VIO, NPC and SBIR.

3.2 Description of Input and Output Documents

Since the computer will require data to produce output, input and output format is described. To register a vehicle, the user will to input details such as: full names, date of birth, gender, vehicle engine number, vehicle chassis number, driver license number, state of plate allocation, name of car, model of car, color of car, brand of car, scanned copy of driver's license, engine capacity of vehicle, year of manufacture, etc. After registration, the user will be given an identification number which will be used to track the progress of the registration. On return, the applicant will input the ID number issues to him on registration. The system has input specification for checking registration status, a separate link has been provided for officials in the respective agencies to verify a registration. The system has login for administrative entry to each agency.

3.3 Overview Description of the New System

The new system, which is web based has many benefits and it is designed to solve the problems noted in the existing system. The new system is a web application designed to

enable vehicle owners to register their vehicles with government authorities in Nigeria. The purpose of motor vehicle registration is to establish a link between a vehicle and an owner or user of the vehicle. This link might be used for taxation or crime detection purposes. In Nigeria, vehicle registration procedure is conducted by five agencies namely: Nigeria Customs Service (NCS), Federal Road Safety Commission (FRSC), Vehicle Inspection Office (VIO), States Boards of Internal Revenue (SBIR) and Nigeria Police Force (NPF). These agencies have parts to play in vehicle registration and there are procedures too in the registration.

The new system is subdivided into several sub-programs called modules which can be debugged independently. The modules in the new system are:

a. NCS Module
b. FRSC Module
c. NPC Module
d. VIO Module
e. Vehicle registration module
f. Payment module
g. About module

3.4   High Level Model of the New System

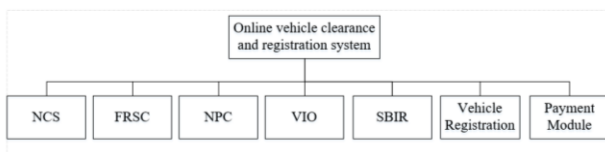The high level model of the new system is shown in figure 3.8.

Figure 3.1: High Level Model of the New System
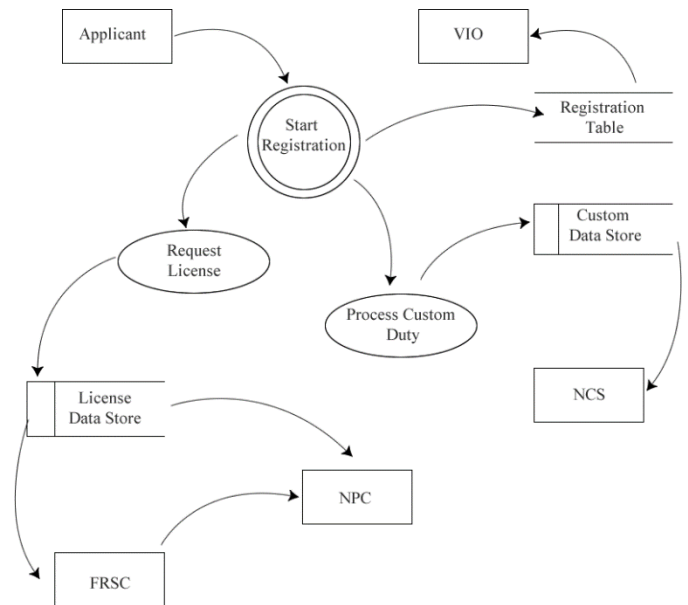
3.5   Overall Data Flow Algorithm

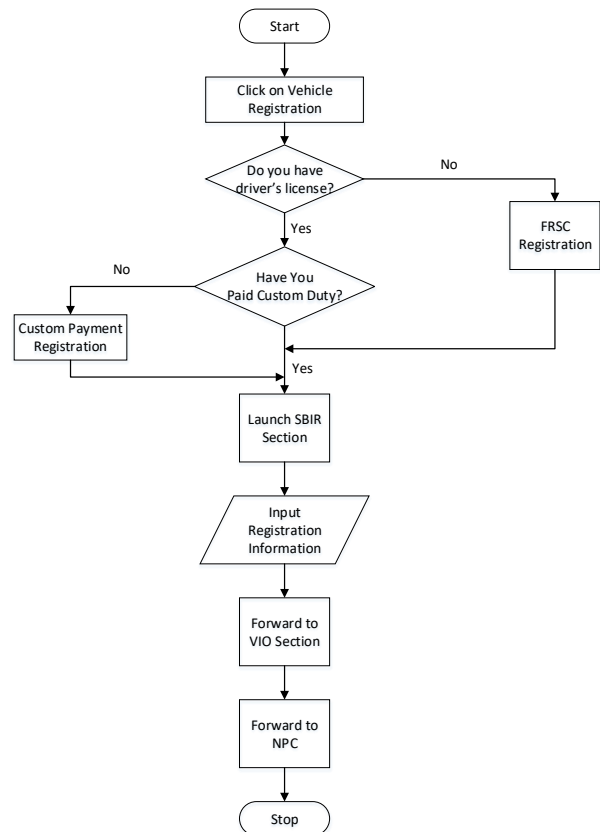Figure 3.2: Data flow diagram of the new system

3.6   System Flowchart

Figure 3.3: system flowchart of the new system

3.7 Summary

Vehicle registration and plate number are performed casually via online and recording of vehicles information, which ranges from cars to buses and later to truck and heavy duty equipment. Vehicle registration in Nigeria began some years ago and the records have been essentially via net which in turn is not helped to raise the efficiency of general automotive services in recent years and voluminous load on Federal Road Safety Commission. A unified registration software was developed which collaborate with other agency involved in the Vehicle registration and management.

The federal government of Nigeria has identified economic development as a major for achieving the 2020 socio-economic development. The vehicle registration system is a must for any country that wants to be information and communication technology inclined and ready to reduce the vehicle crime rate and corruption in her system.

3.8 Recommendations

The following recommendations are made of the unified online vehicle clearance and registration system:

a. It is recommended that this system be used in vehicle registration in Nigeria.
b. The new system is recommended for officers on duty for checking of authenticity of vehicle documents and registration.
c. The new system can be used by the government and other stake holders in Nigeria to monitor the generation of revenue in the country.
d. The system is recommended for the general public for confirmation of services rendered by to them by public officers.
e. For further research, it is recommended that the researcher develop a mobile application for unified online vehicle clearance and registration system.
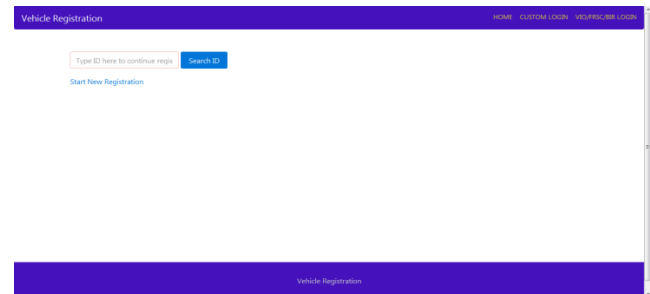
3.9 Contribution to Knowledge

This research will change the way vehicle registration is done in Nigeria. It provides the facility for making vehicle registrations online.
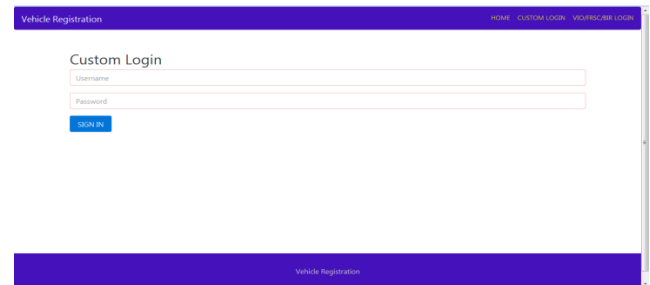
The system allows the applicant to select whether the payment is to be made once for all the registrations. The system can accept online payments which will forester faster registrations since the applicant can pay from home. The new system can be used on the road by officers on duty as a replacement for checking of papers. The general public will not be victims of fraud since they have the privilege of verifying vehicle registration made for them by another person.
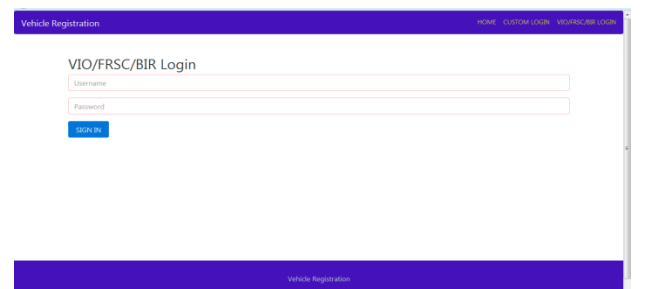
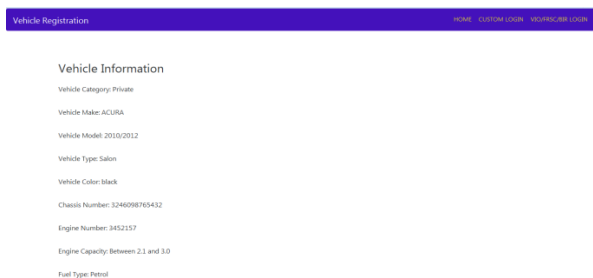## 3.10 Sample Outputs of the Proposed System

New Registration Page

Custom Registration Page

Federal Road Safety Commission Registration Page

Vehicle Information Reregistered

Glossary

Treasury Single Account (TSA) is a financial policy in use to consolidate all inflows from all agencies of government into a single account at the Central Bank of Nigeria.

Application System: It is a collection of procedures, method, instructions and equipment to produce information in a useful form.

Instructional Rules: Information can be defined as the process of gathering, transmitting, receiving, storing and retrieving data or several items put together to convey a desired message.

Vehicle Plate Number: This is a metallic or plastic plate attached to a motor vehicle for official identification purposes. The number is made up of alphanumeric characters or numbers.

Vehicle Registration: is the process where we add a vehicle's details to the motor vehicle register and issue its registration plates. You have to license your vehicle regularly at least annually and you must display a current license label on your vehicle windscreen.

Vehicle Licensing: A regular fee paid to permit the use of one's vehicle on the public roads. The fee helps to pay for road projects and road safety programs. Your vehicle must be both registered and licensed for you to legally drive it on the road.

Vehicle owner: is a person who has met up with the entire necessary requirement for owning a vehicle and has the right to drive it on public roads.

Vehicle Registration and Enquiry Software (VehRES) System: This is an application software that is a customizable data collection system, which can be used by law enforcement and motor vehicle agencies (i.e. Liaison Offices) nationwide.

Licensing office: A place where vehicle registration, licenses and other vehicle related documents are performed.

Licensing officers: Is a person who registers vehicles in the licensing office.

Vehicle: A mechanically propelled and wheeled object used for conveyance.

Computerization: Introduction of the use of computer in an application area by writing a program that will suit the work.
ICT: This is an acronym for Information and Communication Technology.

Federal Road Safety Commission (FRSC): They serve as law enforcement agency charged with responsibilities for, among others, policymaking, organization and administration of road safety in Nigeria.

E-Government: E – Government is a technology exercise, integrating individual database and websites of government.

Driver's license or **driving license** is an official document, which states that a person may operate a motorized vehicle, such as a motorcycle, car, truck or a bus, on a public roadway.

AutoReg Vehicle license: Is the automated vehicle license registration and renewal system, which is for all vehicle owners to

register or renew their vehicle license with the state government. It is renewed annually; it shows the details of the vehicle owner and Vehicle details.

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