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Conceptual Framework on Overcoming the Challenges of Multiple Vehicle Registration in Nigeria: A Mobile Application Approach

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Abstract: *Mobile device can be seen as an effective tool to enhance the process of vehicle registration in Nigeria; this is due to its pervasive nature which allows work to be done at convenience. Mobile application (app) is a platform which works on mobile devices and enables vehicle owners to securely register their vehicles at anytime, anywhere. The tripartite body of vehicle registration is made up of the Federal Road Safety Commission (FRSC), the state Vehicle Inspection Office (VIO), and the State Board of Internal Revenue or the Motor Licensing Authority (SBIR or MLA). The State Board of Internal Revenue or the Motor Licensing Authority (SBIR or MLA) which is our major concern in this work collects revenues made from motor vehicle related activities like; first time registration, renewal etc. In the board of internal revenue, despite its functions, one of the existing problems associated with vehicle registration is multiple registrations. This is a situation where vehicle owners who are in possession of multiple vehicles manually repeat the entire phase of vehicle registration every year, when new vehicle is purchased and during vehicle renewal. To address this challenge, a vehicle registration system which works effectively with a mobile app platform is proposed.*

Keywords: *A Mobile Device, Multiple Vehicle Registration, Mobile Application approach*

I. Introduction

Vehicle registration system is a repository of data and information such as vehicle type, vehicle make, vehicle owner's data etc. while vehicle registration is the process of adding a vehicle to the Motor Vehicle Register (MVR) and issuing it registration plates. The purpose of vehicle registration is to establish clear ownership of vehicle(s) by vehicle owners, this process could be carried out manually or with the use of computers. At present, a number of software has been developed by software developers which allow the process of easy registrations but mobile technology would be seen as a better approach due to its pervasive nature.

The tripartite bodies of vehicle registration in Nigeria is made up of Federal Road Safety Commission (FRSC), who is responsible for designing, producing vehicle number plates and drivers' licenses and ensure credibility of the issuance process to the state governments, [3]. The State Vehicle Inspection Office (SVIO) has a specific role of testing of the drivers for licensing and issuance of certificate of road worthiness while the State Board of Internal Revenue or the Motor Licensing Authority (SBIR or MLA) collects revenue from motor vehicle related activities, [1]. The difference between the SBIR and MLA is that the MLA is a subset of the SBIR at the local government level and the MLA is a vital organ because all vehicles must be registered under a state or local government before it can be licensed. The State Board of Internal Revenue, which is responsible for the registration, collects the stipulated amount as payment through designated banks and also request additional documents like custom papers, proof of address, valid driver's license, engine and chassis number, etc. At the end of these processes, the proof of ownership certificate and plate number is issued [4] However, the registration process requires a visit to each of the three government agencies responsible for payments, data collection and documentation, and verifications.

One of the existing problems associated with existing vehicle registration system in Nigeria is multiple registrations (repeated registrations). This is a situation where vehicle owners who are in possession of multiple vehicles repeat the entire registration process. The repetition of entire registration process is also applicable to vehicle renewal process as well as newly purchased vehicles. It is envisage that this repeated process could lead to redundancy in the vehicle registration system's database. However, in order to overcome this challenge, the need to adopt mobile app technology is proposed. Mobile applications (apps) are platforms that are developed for mobile phones and to be used by mobile users thus providing a user friendly platform. The introduction of this technology into the vehicle registration system will not only allow vehicle owners or customers to have easy access to vehicle registration process as well as checking multiple registration, but it will be useful in data collection and, to offers a secured (e-payment) payment platform to the customers. The use of an app will also eliminate the stress and time spent during registration of a vehicle(s). The remaining part of this paper is

organized as follows: section 2 is the review of related literatures, in section 3, the description of the proposed system is presented while section 4 draws the conclusion.

II. Related works

The authors in [7] presented a framework for Client-Server Distributed Database System for Licensing and Registration of Automobiles in Nigeria. It is an intelligent system that is capable of checking and detecting a multiple registrations, registration of stolen automobiles, malicious registrations, registration of damaged or refurbished automobiles and fictitious registrations. The system is also capable of generating reports for decision makers to enable monitoring and enforcement. The system consists of a relational database of automobile decision variables which could be shared by the three level organizations; VIO, Federal Road Safety Commission and the Board of Internal Revenue. The limitation of this system is the overhead and cost in updating the different replicated and fragmented copies which were stored at different sites in different locations. Secondly, the work did not consider using mobile app during the registration process.

The authors in [6] researched on an "Automatic Vehicle Registration System"; they presented a model based on image processing which can be employed for real time automatic vehicle registration system.

A research work on using a Database Management System to develop and implement an Automated Motor Vehicle Management System was proposed in [2]. This work was intended to help manage the movement of vehicles in and out of an organization. The limitation of this work is; the system only registers vehicle for an organization and keep records of vehicles that move in and out of the organization. However, within the ambit of the reviewed literatures, it is observed that, even though automation of the vehicle registration process has been welcomed and implemented in some levels of government, there is still need to adopt a mobile application approach; this will minimize the time used for a registration process as well as address the problem associated with repeated registration, thus reducing redundancy in databases.

III. Description of the System architecture

In the existing system vehicle details provided by the vehicle owners in the Local Government Board of Internal Revenue (LGBIR) are subdivided into two sections: the Licensing office and the Tax office. In these two units, data is collected manually in paper forms and receipts. The officer in-charge further carries the information obtained by the two units to the State Board of Internal Revenue. At the state board of internal revenue, trained personnel documents information obtained from the manually completed documents by a vehicle owner into the database. The database in this can also be accessed by the personnel of Vehicle Inspection Office (VIO) as well as the personnel of Federal Road Safety Commission (FRSC) when situation arise.

3.1 Description of the proposed system

Figure 1 presents a client server architecture which allows a customer to carryout registration using a mobile device and the registration details are stored directly into the SBIR database. The web server serves as the point of entry to the website and any backend system (e.g. database) that it might interface with.

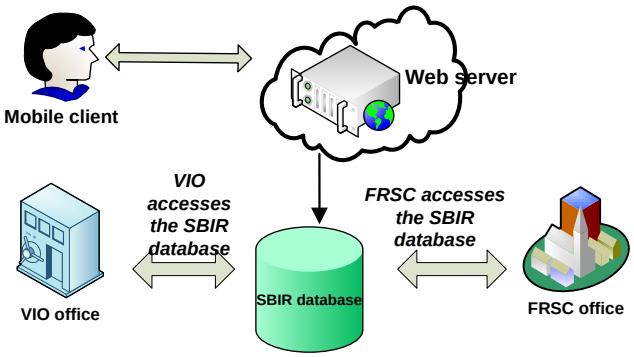

Figure 1: Proposed Approach

In Fig. 1 (proposed approach), vehicle owners (customers) will be able to supply their data and registration details at convenience provided they have internet access. At the end of completed registration, a unique pin will be generated and will serve as the only authority that can allow easy access to the customer's account as well as an authorized administrator. This will creates a platform for a one stop registration transaction. However, the proposed system is designed with Unified Modeling Language (UML) and presented in Figure 2 and 3 respectively.

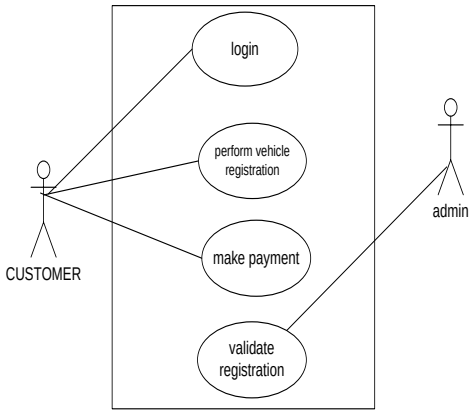

Figure 2: Use Case diagram of the proposed approach

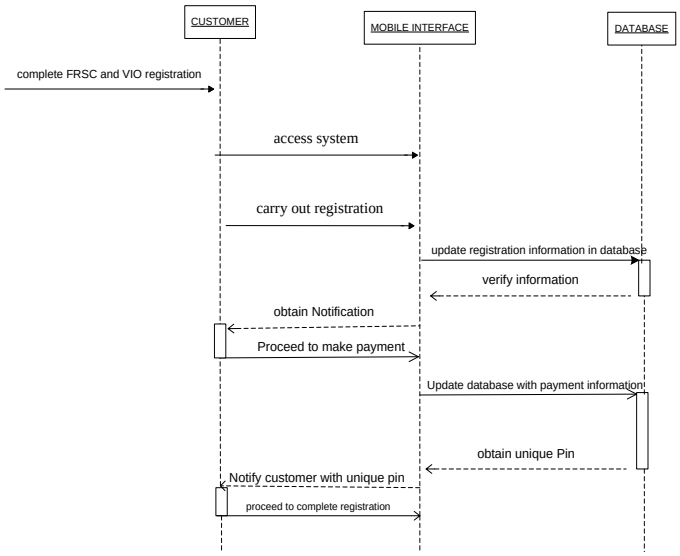

Figure 3: Sequence diagram of the proposed approach

IV. Conclusion

With the evolution of mobile technology sweeping across the globe, the proposed system will help fast-track the vehicle registration process. The deployment of the vehicle registration system via a mobile application will enhance easy and fast vehicle registration process as well as increasing productivity. Nevertheless, the proposed system will allow customers to register their vehicle (s) once, and the customer will also have the liberty to register as many vehicles as possible where each of these vehicles is linked to one account. The implementation of the proposed system is a work in progress.

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