

Managing vehicle information for revenue driving and crime management in a developing country – (a computer based approach)

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Abstract - In everyday fast insecure world, the need to maintain a well secured vehicle information management system is increasingly significant and increasingly complicated. Presently, terrorism attacks are being spread from states to states, from countries to countries and thus, a proper security approach needs to be adopted by the government in order to protect vehicles and their owners. The perpetrators of this act make use of stolen vehicles and abandon them after using them. Most of these terrorists make use of stolen vehicles (government or individual owned) to perpetuate their acts. Sometimes, when these vehicles are stolen, their plate numbers are changed and later abandon these vehicles or even sell them to unknown persons, which in most cases cause problems to the buyer of such vehicles. In developing countries, Nigeria for instance, vehicle information management is posed with problems of fake particulars issued to unsuspecting motorists by fake licensing officers; improper checking procedures by the law enforcement agencies due to weak information management mechanism system put in place. These exercises lead to confrontation between the citizen and the law enforcement officers. The current system sabotages the effort of government in revenue driving, as most vehicles are not duly registered. This cannot even be detected during inspection. Managing Vehicle crime related cases are difficult due to weak information management mechanism in place. Therefore, a vehicle information management system which is based on a centralized database for Vehicle Registration using MYSQL database engine technology on computer that effectively allows law enforcement officers to access vehicle information from a remote area or from any desired location provided that there is network connectivity is apt.

INTRODUCTION

Recently, it has become more evident that law enforcement agencies are spending money and efforts in computerizing their activities and examining current information systems. Existing systems are being considered for revision in the light of modern business practices. Unlike other businesses, however, the bottom line in policing is not profit, but public order and safety. For the most part, vehicle inspection unit information systems have functioned as little more than expensive electronic file cabinets. While they have improved the efficiency of filing and retrieving a single file or piece of information, these systems have not helped to answer the question of how to best use the data collected and how to track the progress of

crime cases starting from the incident scene through arrest and investigation process to the court. (Oladimeji, Onyesolu & Yusuf 2018).

The aim of this study is to design a framework for Vehicle Management Information System, which will serve as roadmap or guide for law enforcement agencies in managing information related to vehicle security and to help government in revenue driving. The specific objectives are:-

- To develop a computer based access system that will give detailed information relating to a vehicle and help in tracking process for investigation purposes.
- To develop a centralized database for Vehicle Registration using MYSQL database engine.
- To use the Object Oriented Analysis and Design method to achieve a system that is broken down into modules for future modification

Previous Work on Information Management System

Nwobodo and Inyiama (2013) proposed a GSM-Based Vehicle Inspection and Verification System. This system tends to overcome the problems of vehicle stealing and vehicle verification. It is a means by which an authorized agent accesses the company's database to view information about any type of vehicle anytime, anywhere, even in remote areas that has GSM network coverage. The data or code which can be used to view the Vehicles details could be the chassis number or the engine number; this is a number that no two vehicles can have. With this new system, a company that deploys it will be able to have an easy and fast way to detect unauthorized vehicle users, enhance effectiveness and efficiency in the work by avoiding the use of papers and files. There will be consistency and enhanced security of data and easy access to data in terms of update, retrieval and accessing of records. Nwobodo and Inyiama study tend to protect the vehicle recovery in case of it get stolen, be the study did not proffer solution in term of crime control and revenue driving by the government, this is the area in which this study differs and tend to address.

Analysis of the Existing System

The current Vehicle Information Management System is done manually (flat file system). The payment and

insurance of payment receipt is done manually which give room for fraud and sharp practices. Sabotaging government effort in revenue driving. Most times identifying fake from genuine vehicle documents becomes problem as there is no any security measure put in place to checkmate the authenticity, rather than official stamp and government logo(coat of army) which can be counterfeited. The existing system is characterized but not limited to the following inefficiencies.

- i. Law enforcement duties overlapping.
- ii. Both law enforcement agency and citizen in confrontation during vehicle inspection exercise, as citizen most times doesn't even know exact vehicle particular to be collected.
- iii. Authentications of vehicles registration particulars become difficult in current system.
- iv. The current system makes retrieval of information very difficult because of the large volume of file one has to sort through to retrieve or have access to one's file.
- v. Lot of time is devoted to the filing of duplicates in logical way. For easy retrieval of information.
- vi. The current system lacks a database for the storage of files which make those files to occupy physical storage space. (Oladimeji, 2015).

The Proposed System of Vehicle Information Management System

This article aim to design a framework for Vehicle Management Information System, which will serve as roadmap or guide for law enforcement agencies in

managing information related to vehicle security and to help government in revenue driving. The system involves the design of an application that seats on the server and this housed all information and data been collected from the vehicle owner during registration. The system registers all vehicles and captures all information about the vehicle and stores them in the database for future reference. To achieve this using the object oriented design methodology, we analyzed all the functional requirements, described them. Meanwhile, the functional requirements and their analysis are presented below:

Functional Requirement

Functional Requirement describes the use cases and actors that are found in the Vehicle Management and Information System. Each use case is described in details with diagrams and tables in their respective module section. These use case diagrams model the desired behavior of the system. The Functional requirement is categorized in two main modules:

1. User Module
2. Administrator Module

User Module

System user with user role is those users with user role as assigned by system administrator. As the name given, this group of user will act as user/staff in the system. Users can:

- Run check on vehicles
- Report vehicle (suspicious, stolen, etc vehicles)
- Log out of the system

The requirement analysis for user module can be transformed into the following use case diagram as shown figure 1.

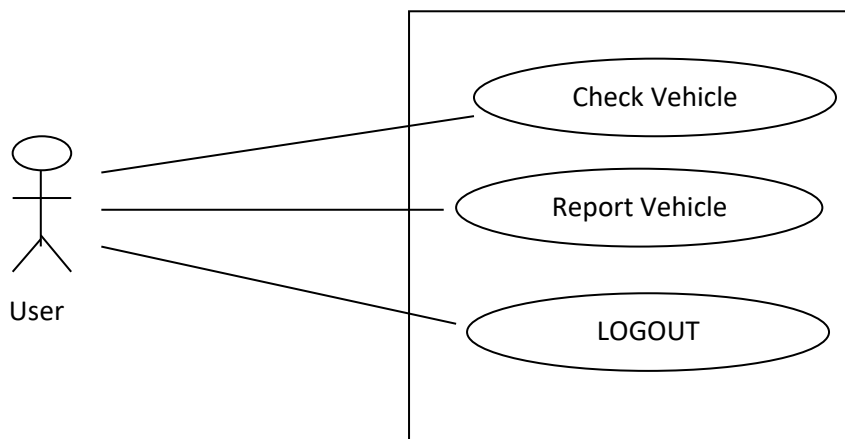


Figure 1: User Module Use Case Diagram

Table .1 – User Module Actor Description

Actor	Description
User:	The user is responsible for checking vehicle, reporting vehicle, etc.

Table 2 – User Module Use Case Description

Use Case	Description
Check Vehicle	In the field, user can check for vehicle details from central database.
Report Vehicle	Users can report suspected vehicle(s) to the admin or appropriate channel
Logout	Logging out of the system

Administrator Module

Administrator module is the module that enables administrators to configure and maintain various variables in the system. This module will allow administrators to configure general information and assign user role to other users.

System user with administrator role is the user with super user role to the system. This category of user will have the

full administrative access rights to each module in the system. The administrator is the "gatekeeper" of the new system who creates user profiles for the system and is responsible for restricting the access to other users. The administrator can add as many users as needed and he is the key person who will assign user to different role of the system. The Administrator Module requirements analysis can be transformed into the use case diagram as shown in figure 2.

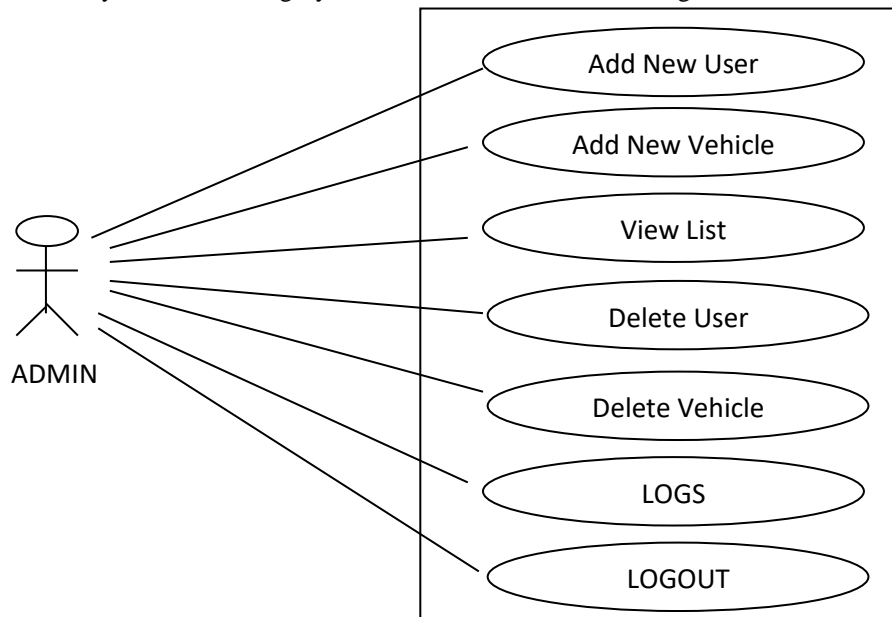


Figure 2: Administrator Module Use Case Diagram

Table 3 – Administrator Module Actor Description

Actor	Description
Administrator:	The system administrator who is super user of the system and is responsible for creating new user, vehicle registration, view list, etc.

Table 4 – Administrator Module Use Case Description

Use Case	Description
Add new user	When there is need for new user(s), their details are recorded into database.
Add new Vehicle	When there is request for new vehicle registration, its are recorded into database.
View List	When there is need to view list of users, vehicles, etc.
Delete User	When staff leaves the institution their details will be deleted from database.
Delete Vehicle	When vehicle leaves the country or the vehicle has been destroyed its details will be deleted from database.
Log	When this is need to view all users that are logged on.
Logout	Logging out of the system

Advantages of the New System

- i. The new system automates the vehicle information management system process thereby eliminating the loopholes associated with the current system.
- ii. Linking up with relevant law enforcement agencies database will help in easy retrieval of vehicle information and control data concurrency.
- iii. The use of password is incorporated to maintain and ensure data security and integrity.
- iv. Window workflow foundation will keep track of the movement of information online in case of delay in the information retrieval.
- v. The new system will improve revenue generation and collection of the government and reduce corruption.
- vi. The new system is cost effective because information can be accessed through cell phone. Then maintaining physical document which will help to save money on printing. Duplicating of document as well document maintenance over head.
- vii. The new system will eradicate most confrontation usually experience between law enforcement agency and vehicle owners.

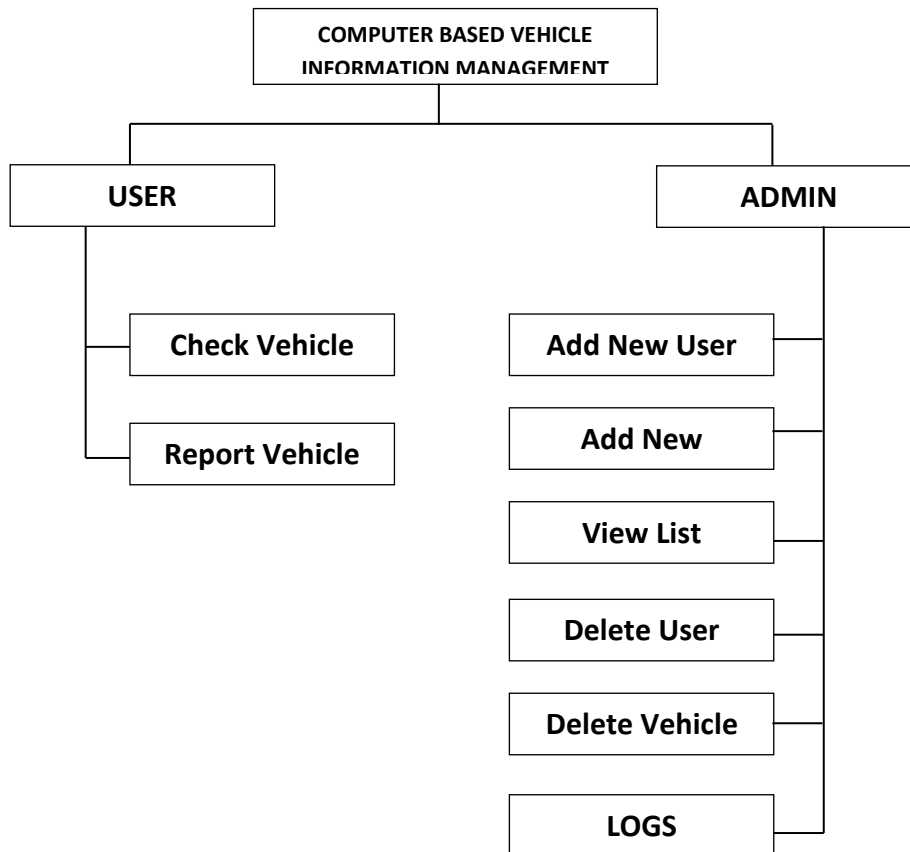
Justification of the New System

After a thorough analysis of the existing system and a careful feasibility study to find out if there is need for

automation of the existing system. The adoption and implementation of the new system will in no doubt be of great benefit to the both law enforcement agency and citizen which will help in overhauling the current system which is characterized by in consistency, data security lack of data integrity, concurrency problem and assist in fast vehicle verification exercise. The new system which will run on a server with its robust database which will prevent ineligible law enforcement officer from accessing vehicle information, ensure data integrity by eliminating duplicity of information, keep track of information in the system and above all interconnect all those involved in the registration and vehicle inspection process.

High Level Model (HLM) of the New System

The high level model for the new system is presented in figure 3. This depicts the menus and submenus of the system. The models for structuring a system are concerned with how a system is decomposed subsystems. To work as system, sub-systems must be controlled so that their services are delivered to the right place at the right time. The call – return model of the centralized control style was adopted. This is familiar top – down subroutine model where control starts at the top of a subroutine and through subroutine calls, passes to lower levels in the three.



SUMMARY AND CONCLUSION

It is a well-known fact that insecurity is what most of the developing nation spend their affluence on. Many researchers have tried to have a lasting solution to these problems by try to profound solution in different ways in like manner of this study. Computer - Based Vehicle

Information Management System is widely available means of vehicle inspection for most laws enforcement agency. The Computer - Based Vehicle Information Management System tries to approach vehicle inspection from the point of social interaction between the vehicle users and inspection officers to improve the security to a certain level.

The existing system needs the vehicle user to produce the registration documents, while in the new system the plate number is only required. With the used of this system the issues of vehicle be stolen or collect at gunshot will be reduced if not totally eradicated and boost revenue driving.

RECOMMENDATION

This study will go a long way to eliminate fraud associated in vehicle registration if well applied. It is therefore recommended that the government should adopt the system in vehicle registration information access exercise and extend Autoreg registration to Local Government liaison offices to maintain a central database of all registered vehicles in Nigeria. The Nigerian Police and the Road Safety Commission should as well adopt the system in tracking vehicle crime related offences.

AREAS OF APPLICATION

The need for good record-keeping and information-sharing practices has taken on added significance in today's global environment. Not only do good records provide crucial internal information (i.e., business operations and case management support—not to mention the official memory of an agency's investigations), law enforcement agencies now need to communicate agency-to-agency and across continents in order to protect the Nation's citizens. Nothing is more important to accomplishing that mission than having accessibility to accurate and timely records. Consequently, this study will be suitable and appropriate for the law enforcement agency saddle with responsibility of vehicle inspection and investigation.

REFERENCE

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