Realtime Drug Interaction, Verification and Authentication System

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ABSTRACT

This research was centered on real time druginteraction, verification and authentication system. It is a research work geared towards establishing the means of identifying authentic drugs in Nigeria with emphasis on identifying the manufacturing date and expiration date, side effects, using web based system.This research aims at providing an effective solution for patients and health professionals to establish drug authentication, allergic reactions and interactions and protect the patients' health and life safety. The result of this research work was to develop a Web based database to enable the patients to check the interactions of the drugs online from any location and time. The methodology adopted was Object oriented Analysis and Design Method because of its ability to create different modules and reuses it. The system implementation is achieved using My SQL as the backend database, and object oriented PHP programming language, this language was chosen because of its easy syntax and features for developing web based applications with HTML for the application programming interface.
Keywords: DBMS, Menu, Drug, Management information system.

INTRODUCTION

This research paper isemphasizingon therole of real time in drug interaction, verification and authentication system [1]. A real time system is any information processing system which has to respond to externally generated input stimuli within a finite and specified period, the correctness depends not only on the logical result but also the time it was delivered, failure to respond is as bad as the wrong response.A real-time computer system must react to stimuli from the controlled object (or the operator) within time intervals dictated by its environment. The instant at which a result is produced is called a deadline. If the result has utility even after the deadline has passed, the deadline is classified as soft, otherwise it is firm. If a catastrophe could result if a firm deadline is missed, the deadline is hard [2]. Verification is the confirmation, through the provision of objective evidence, that specified requirements have been fulfilled. Authentication is the process of recognizing a user's identity. It is the mechanism of associating an incoming request with a set of identifying credentials [3]. The credentials provided are compared to those on a file in a database of the authorized user's information on a local operating system or within an authentication server [4]. The system will be used to as certain the authenticity of drugs at any point in time [5]. This is because patient have been having difficulties in buy genuine drugs from drug market. The result of this research work is to develop areal time system that can verify, authenticate drug and give detailsofdrug Interaction [6,7]. This research paper is organised as follows; section I contains the introduction of real time drug interaction, verification and authentication system, section ii contains the related work of real time drug interaction, verification and authentication system, section III contains material and method of real time drug interaction verification and authentication system, section IV contains design and implementation, section V contains result and discussion while section VI contains the reference [8,9].

Related work

Over the years, drug verification and authentication have been a challenging task which different solutions have been proferedstill counterfeit drugs are still in circulation in the Nigeria market. These are the existing product that has been used to ensure drug authentication [10]. NAFDAC Automated Product Administration and Monitoring System (NAPAMS), is software solution for the regulation and control of the importation, exportation, manufacture, distribution, advertisement, sale and use of Foods, Drugs, Cosmetics, Medical Devices, Chemicals, Detergents and bottled water in Nigeria. It is a web based enterprise software solution which is accessible via two modes. Online using a laptop through the web interface and A Mobile phone for product validation and enforcement. In May 2007, NAFDAC Green page was introduced, a comprehensive multimedia publication that contain particulars of all NAFDAC registered product [11]. Recently, NAFDAC has a Mobile Authentication Service (MAS) that enables people to verify whether a drug is original or fake with their mobile phones. Adverse reactions to medications are common, yet everyone responds differently. One person may develop a rash or other reactions when taking a certain medication, while another person on the same drug may have no adverse reaction at all. Only about 5% to 10% of these reactionsare due to an allergy to the medication. Real time system of ten part of an embedded or cyber-physical system which the Computer system performs a specific task (not general purpose). Tight interaction with physical environment (sensors, actuators), Dependability, Resource efficiency (costarecritical), Increasing importance of security [12]. In this research, the role of a real time system cannot be over emphasized, knowing full well that so many lives are at stake when handling issues related to health and also considering the well-being of Nigeria citizens at large. This project therefore seeks to develop an online verification system to help drug consumers know the authenticity of a drug and find out if a particular drug has side effects or not.

Benefits of Management Information System

According to [5], the disintegration of record management program in organizations has led to the inefficiency in administration and loss of vital information needed for decision making in hospitals. Therefore to ensure proper records of drug interactions, information management system should be integrated into the pharmacy such that; Database is developed and is seen as a warehouse of information, where large amount of data can be stored to help users search on the interaction of drugs [10].

III MATERIALS AND METHODS

MATERIAL USED

PHP: Hypertext Preprocessor (PHP) is a server-side scripting language designed for Web development, also used as a general-purpose programming language. PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management systems, and web frameworks. Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web a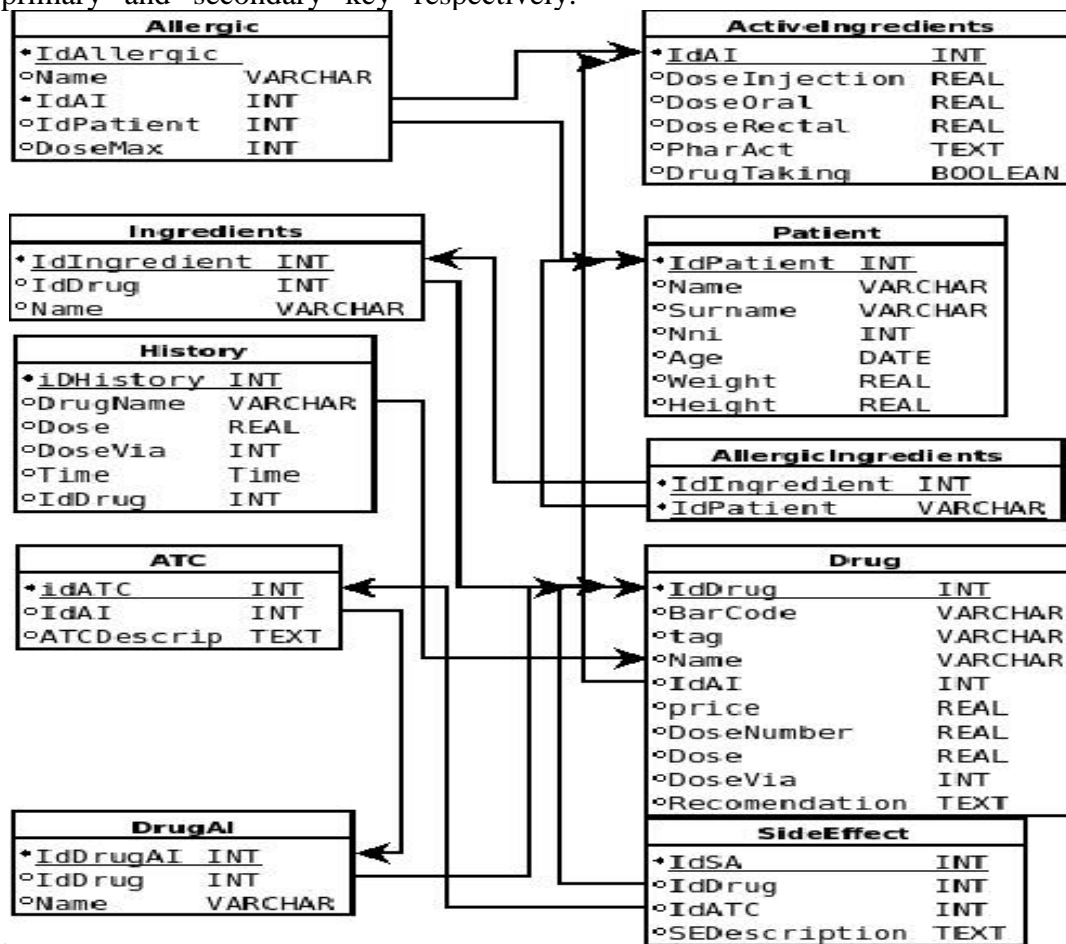pplications. It forms a harmony of cornerstone technologies for the World Wide Web with Cascading Style Sheets (CSS) and JavaScript. HTML elements are the building blocks of HTML pages. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document. Cascading Style Sheets (CSS) is a style sheet

language used for describing the presentation of a document written in a markup language like HTML. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate css file, and reduce complexity and repetition in the structural content. XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. XAMPP is a free and open source cross-platform web server solution stack package consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. Everything needed to set up a web server – server application (Apache), database (MariaDB), and scripting language (PHP) – is included in an extractablefile. Adobe Dreamweaver is a web design and development application that combines a visual design surface known as Live View and a code editor with standard features such as syntax highlighting, code completion, and code collapsing as well as more sophisticated features such as real-time syntax checking and code introspection for generating code hints to assist the user in writing code. Combined with an array of site management tools, Dreamweaver lets its users design, code and manage websites, as well as mobile content. Dreamweaver is an IntegratedDevelopment Environment (IDE) tool [4].

Drug Database architecture

The drug ID and drug name is used as the primary and secondary key respectively.

Allergic
- IdAllergic
- Name — VARCHAR
- IdAI — INT
- IdPatient — INT
- DoseMax — INT

ActiveIngredients
- IdAI — INT
- DoseInjection — REAL
- DoseOral — REAL
- DoseRectal — REAL
- PharAct — TEXT
- DrugTaking — BOOLEAN

Ingredients
- IdIngredient — INT
- IdDrug — INT
- Name — VARCHAR

Patient
- IdPatient — INT
- Name — VARCHAR
- Surname — VARCHAR
- Nni — INT
- Age — DATE
- Weight — REAL
- Height — REAL

History
- iDHistory — INT
- DrugName — VARCHAR
- Dose — REAL
- DoseVia — INT
- Time — Time
- IdDrug — INT

AllergicIngredients
- IdIngredient — INT
- IdPatient — VARCHAR

ATC
- idATC — INT
- IdAI — INT
- ATCDescrip — TEXT

Drug
- IdDrug — INT
- BarCode — VARCHAR
- tag — VARCHAR
- Name — VARCHAR
- IdAI — INT
- price — REAL
- DoseNumber — REAL
- Dose — REAL
- DoseVia — INT
- Recomendation — TEXT

DrugAI
- IdDrugAI — INT
- IdDrug — INT
- Name — VARCHAR

SideEffect
- IdSA — INT
- IdDrug — INT
- IdATC — INT
- SEDescription — TEXT

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Methodology Adopted

A system development methodology refers to the framework that is used to structure, plan, and control the process of developing an information system. A wide variety of such frameworks have evolved over the years, each with its own recognized strengths and weaknesses. One system development methodology is not necessarily suitable for use by all projects. Each of the available methodologies is best suited to specific kinds of projects, based on various technical, organizational, project and team considerations. The methodology considered by the researchers is Object-Oriented Analysis and Design.

Object-Oriented Analysis and Design Method (OOADM)

The methodology to be used in this project is Object-Oriented Analysis and Design Method (OOADM). It is a technical approach used in the analysis and design of an application or system through the application of the object-oriented paradigm and concepts including visual modeling. This is applied throughout the development life cycle of this application or system, fostering better product quality and even encouraging stakeholder participation and communication. OOAD is best applied iteratively since there is no clear process involved, but each aspect where OOAD is applied is refined as it is reused. This is because major portions of the designs are based on the entire aspects of the system and on the entities rather than on individual functions and code. This enforces the modular approach

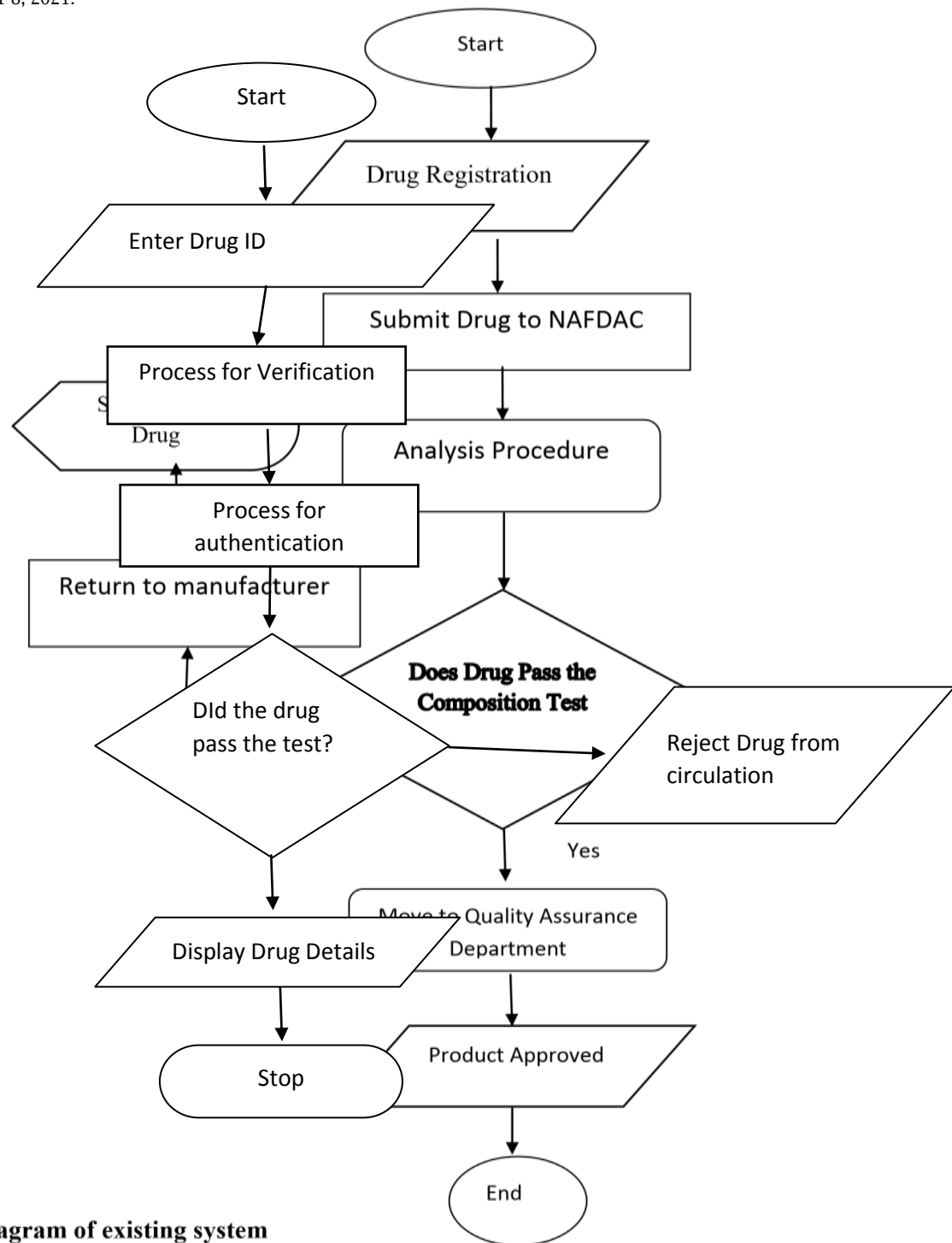of OOAD whose goal is to break down the problem or the system into smaller units, called objects that can stand on their own and be changed without affecting the ones around them too much. This makes it easy to add functionality and behavior and allow the system to gracefully accept change.

DESIGN AND IMPLEMENTATION
DESIGN

The system was designed using object oriented programming language due to its unique features in carrying out this research work such as creating of different classes of object example POST(Where different drugs can be published and updates be made.), MEDIA (collection of different pictures associated with each drugs are stored.), PAGES (Collection of different functionalities associated with the system), etc. the above feature works in other to provide necessary information about a particular drug that will help the consumer / patient in identifying an authentic drugs for consumption. The research aims at providing an effective solution for patients and health professionals to establish drug authentication, allergic reactions and interactions and protect the patients' health and life safety. In achieving the objective, following objectives have been set: Develop a Web based database to enable the patients to check the interactions of the drugs online from any location and time. Develop a centralized location where side effects of drugs can be verified. Provide information on drugs that can serve as (antidotes) neutralizer to other drugs.Verifying 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.Provide necessary support to the regulatory agencies in controlling drug reactions and mass mobilization.

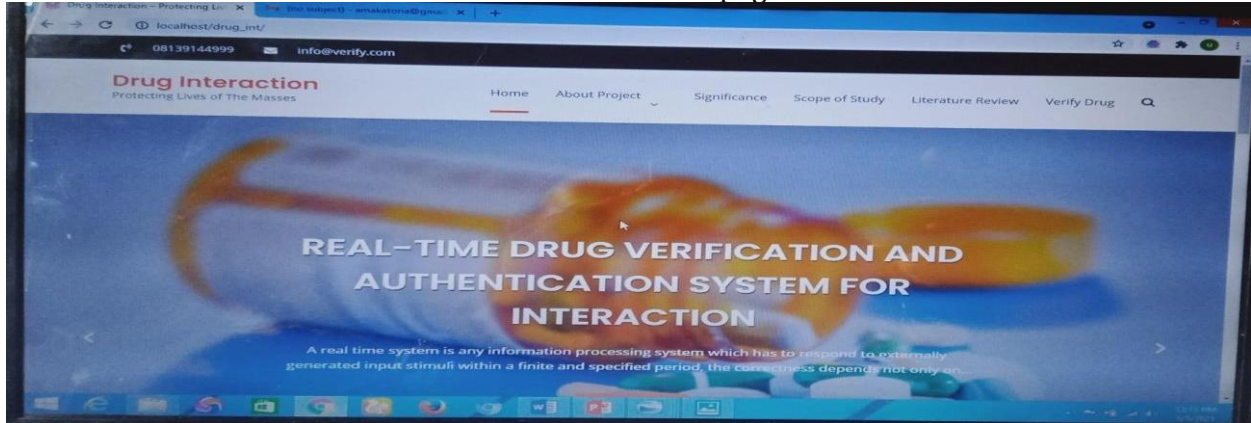**Fig 3.1 Dataflow Diagram of existing system**

Program flowchart

IMPLEMENTATION

Systems implementation is the process of defining how the information system should be built (i.e., physical system design) confirming that the information system is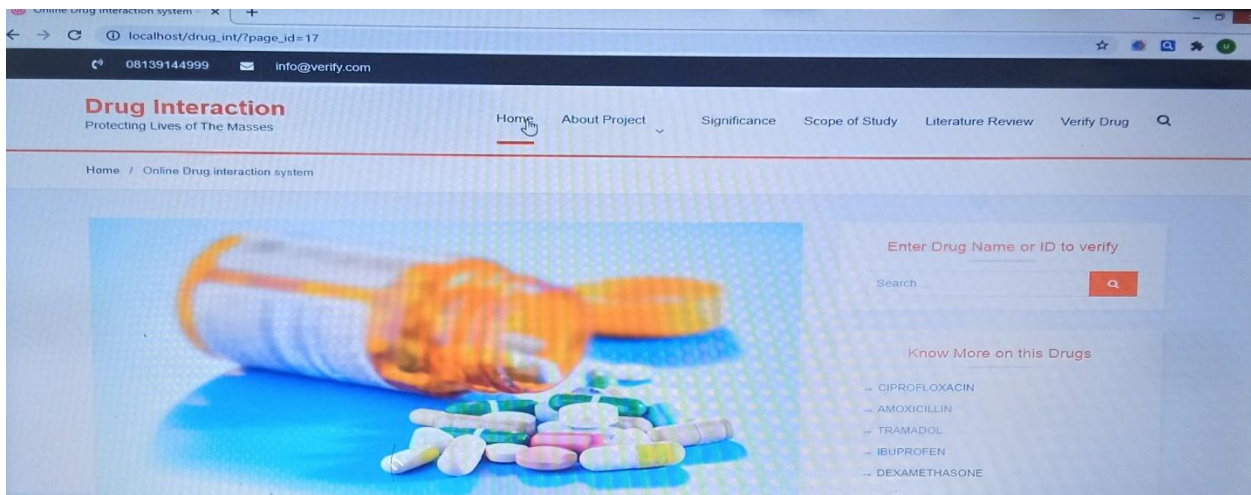 operational and used, ensuring that the information system meets quality standard (i.e., quality assurance). Therefore, the system was successfully implemented after the researchers confirm that modules are in good working condition (i.e. operational).
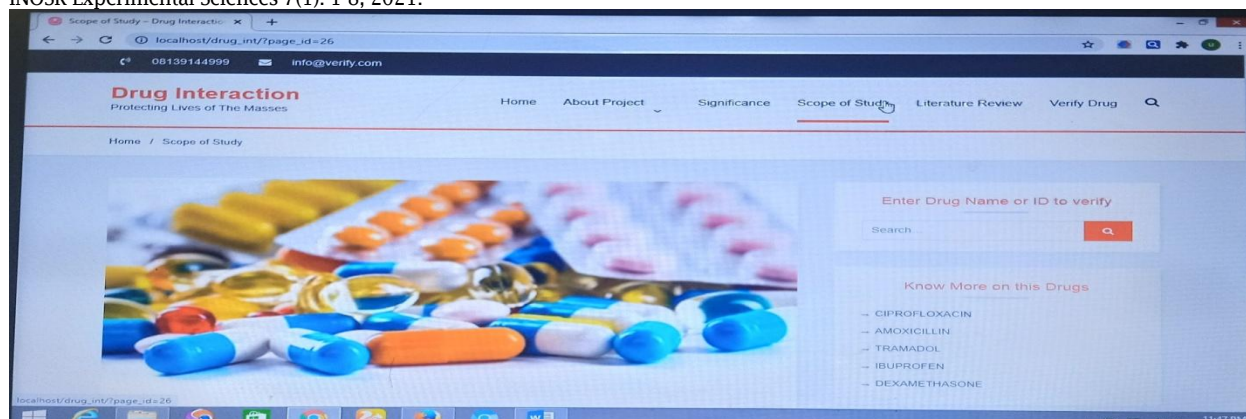
The front end page

Home page: the home page contain all the necessary information about the research, i.e. different sub menus are found in the page.

Authentication page: In this page, the verification process takes place here, drugs can be verified using drug name or drug ID as the case maybe.

RESULT AND DISCUSSION

The results gotten from this project presents in a precise manner, the importance of knowing drug authentication, and reactions/side effects to health. It is believed that if this research wok is fully implemented will help reduce the rate at which people die due to drug counterfeiting and side effects. 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 drugs that have less effects on them. The software developed from this study will be useful to the end users or the patients in helping them to verify the drugs they buy for medication.

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