

## Design and Implementation of an Analytical Software for Trado-Medical Patients' Data

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### ABSTRACT

In Africa, the adoption and use of ICT in the modern healthcare sectors has greatly transformed the process of health care delivery to patients. However, most Africans also consult health care services from Trado Medical Health sectors which predominantly still use the manual data processing method in dealing with their patients transactions. As such, information processing, retrieval and further data analysis is always difficult to carry out by the Trado-medical personnel's due to the ills associated with this manual method. This paper aimed at proffering an alternative approach by designing a framework with some level of knowledge management that can be implemented through system modeling and implementation. To this end, a simplified computerized analytical system to ease data processing and analysis as an alternative solution to the use of the manual approach was developed using UML Design tools and Visual Studio .Net framework. The developed software solution can carry out simplified data analysis on patient's data resulting in more effective diagnosis and report generations by the trado medical health care givers.

**Keywords:** Trado Medical, system design, analytical software, SDGs,

#### CISDI Journal Reference Format

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### 1. INTRODUCTION

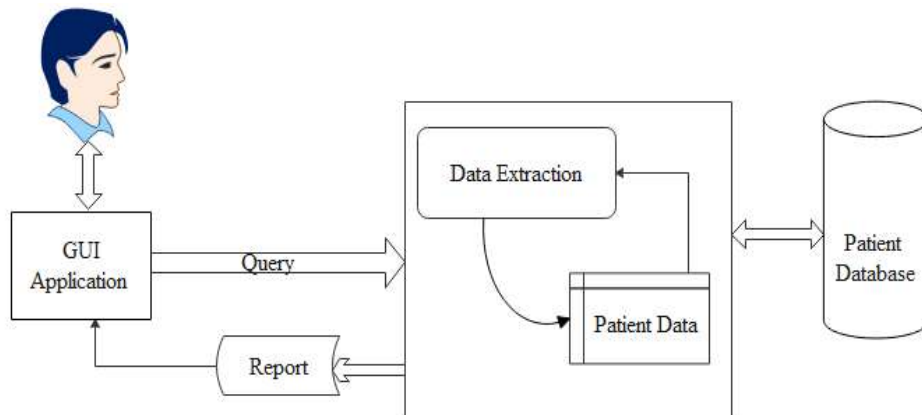
Countries worldwide are working to enhance quality health and wellbeing for their citizens. Achieving universal healthcare by meeting United Nations (UN) Sustainable Development Goal (SDG) 3 is the focus of many countries. The SDGs provide an ambitious and comprehensive plan of action for ending the injustices that underpin poor health and development outcomes (SDGF, 2020). In the spirit of sustainability and standardization, WHO (2019) has thrown the challenge to the global community to build knowledge bases for the management of traditional herbal medicine in its Traditional Medicine Strategy (WHA62.13) 2014 -2023 (WHO, 2019). Historically, several approaches have been adopted to assist in properly and sustainably securing, in addition to efficiently sharing knowledge. Current practices and the nature of the challenges presented point toward employing knowledge management approaches which largely is dominated by computer-based solutions. Therefore, a computing-based solution is advocated to be most suited to answer this call and novel approaches to help safeguard ATHMed knowledge (Devine et al., 2019). Traditional herbal medicine was the first method of healthcare practice in Africa (Appiah et al., 2019).

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Traditional herbal medicine with other complementary and alternative healthcare practices are widely prevalent in many regions in Africa (James et al, 2019, WHO, 2019). This prominence has encouraged WHO and other multilateral organizations to play “key roles in supporting capacity development in the traditional medicine sector, including the development of local manufacturing “ (WHO, 2021), leading to WHO, the African Union Commission and Africa CDC jointly launching the Regional Expert Advisory Committee on Traditional Medicine for Covid-19 Response (WHO, 2021). Literatures have shown that a lot of these herbal users are in developing countries due to the perceived potency, ease of use, convenience and low cost (James et al., 2018, Appiah et al., 2019, WHO, 2019). However, there are reported cases of misappropriation, misinformation and abuse of herbal knowledge in relation with traditional health information storage and processing due to poor documentation (Yeboah, 2000). The lack of proper documentation by trado medical experts ranging from selection of ingredients, preparation methods, and their administration has brought the quality, efficacy and safety of traditional medicine into distrust (Chikezie and Ojiako, 2015). The relevance of adequate herbal trado medical information storage and processing cannot be over emphasized as it holds strategic influence on the growth, sustenance, and competitive advantage of any environment, organization or people (Davenport and Prusak, 1998, Xue 2017). While the usage of application software is still dwindling in trado-medicine, modern medicine is already embracing more technologies to enhancing quality healthcare service delivery like the introduction of big data analytics in healthcare (Kornella and Andrzej, 2022).

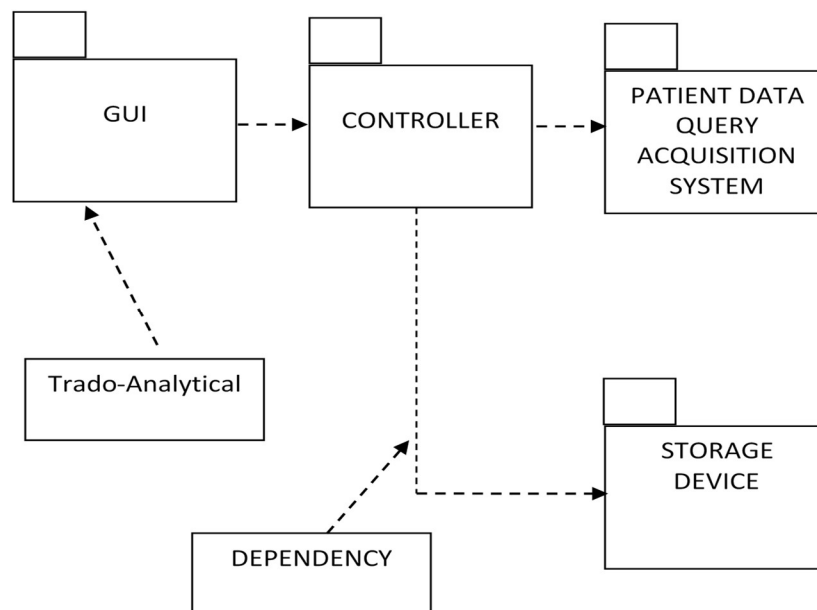
## 2. LITERATURE REVIEW

Literatures have suggested that across Africa most people make use of Trado Medical drugs and research outcomes have clearly shown that its usefulness far outweighs its demerits (Avendeno and Menendez, 2014; Elias et al., 2013; Gakunga et al., 2014; Jasamai et al., (2017). Therefore, there is the need to develop software applications in carrying data storage and data analysis of patients that patronize trado medicine. So far, generic software applications such as SPSS, Microsoft Excel etc have been used in carrying out data analysis (Ohemu et al., 2017; Pearson et al., 2018; Gurmu et al., 2017, Shreyas and Manonmant 2021). For example, Ohemu et al., (2017) examined the knowledge, attitude and practice of traditional medicine among people of Jos North Local Government Area of Plateau State, Nigeria. A descriptive cross sectional study was carried out on 300 residents of Jos North Local Government Area. A systematic random sampling was used to select households at intervals of six. Data was collected through the use of structured open and closed ended questionnaires and interview and the data were analysed using SPSS 20. 274 out of 300 questionnaires were valid. The architectural design is shown in Figure 1 which consists of the Graphical User Interface (GUI) where users can send their request or queries based on some specific parameters and receive reports from the system which operates on the internal components of the system performing some reasoning capabilities and extractions of data from the patient database.



**Figure 1: Architectural Design of Analytical Trado medical Patient Data**

Among the respondents, 56.9% are between 19-28 years. 100% of the participants have good knowledge of traditional medicine, 62.8% had no adverse effect from the use of traditional medicine, while 70.1% do not agree that traditional medicine is safer than modern medicine. 70.4% of the participants plan to use traditional medicine in the future. 29.9% of the respondent prefer traditional medicine, 31.8% prefer modern medicine while 38.3% prefer both. The population in Jos North has good knowledge with high acceptability and use of traditional medicine. The main reasons for the high acceptability are due to lesser cost, availability, effectiveness and efficacy. The use of this generic applications by herbal professional will require overheard cost in training them as most of their knowledge in the area of computation is at the naive stage. The aim of this research is to develop a more simplified application that will be easy to use and more convenient for the purpose of patient's trado medical data storage, processing and analysis.

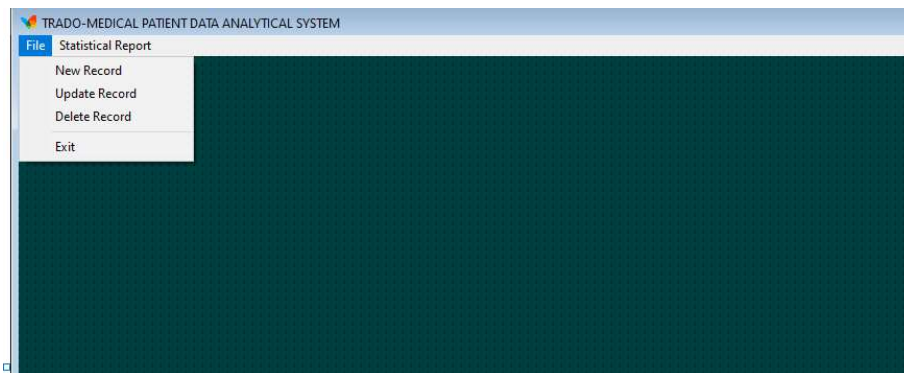


**Figure 2: Deployment Diagram for the Trado-Medical Patient Data Analytical System**

The deployment diagram for the Trado-Medical Patient Data Analytical System is given in figure 2.0. It consists of a 3-tier structure having the Trado Medical Analytical Graphical User Interface as the front end layer through which users query the database. The Controller and the Dependency is the middle layer where the data extraction is done from the patient dataset based on relational functional dependency of the various patients relations with regard to request issued from the user. The backend consist of the database of the patient information and storage for the entire application. Whatever data the user entered into the system, the data is passed to the patient data query acquisition system through the controller. The controller is the knowledge based component through which the users request is processed. Also the data passed by the controller to the patient data acquisition system is also stored in the storage device for reference purposes.

### 3. SYSTEM IMPLEMENTATION AND DISCUSSION

This is the stage of software development process where the system is fully implemented by the user. For the system to be implemented, the prototype system first needs to be accepted by the user. Once fully accepted by the user, the system is test-run with real life data and any other relevant data where appropriate and applicable. The system architecture was built into a functional system using the Microsoft Visual Studio.net and the backend using MYSQL. The developed software is platform independent and requires a minimum RAM size of at least 2GB and hard disk size of at least 65GB free space. The implementation of the system consist of two major menus; File Menu and Statistical Analysis Menu. When the File Menu is clicked, the sub-menu is displayed as in Figure 3.



**Figure 3: Main Menus with SubMenus – File Menu and Analytical Menu**

The New Record sub-menu is used to enter new patient's records into the system. The New Record window is shown in figure 4.

**Figure 4: NEW Trado –Medical Patient Record Entry Menu**

Next, the Update Record menu is used to modify the records in the database, while the Delete Record menu is used to remove records from the database. Samples of their respective screen designs are shown in Figure 5 and Figure 6 respectively.

**Figure 5: Update Trado Medical Patient Record Window UPDATE Record Screen Design**

**DELETE RECORD**

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Ref.No.:

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Surname:  First Name:  Other Name:

Age:  Sex:  Male  Female Phone Number:  Nationality:

Home Address:  State of Origin:

Local Government Area:  Ailment Type:  Date of Entry:  Treatment:

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**Figure 6: Delete Record Screen Design**

Clicking on the Statistical Analysis menu will display two sub menus “Frequency” and “Chart”. Clicking the “Frequency” sub menu will display a screen for the user to enter the date period for the report to be generated. Figure 7 (Frequency) and Figure 8 (Chart) shows sample data.

TRADO-MEDICAL PATIENT DATA ANALYTICAL SYSTEM	
ENTER START DATE: 09/12/2019	ENTER END DATE: 11/12/2019
AILMENT	NUMBER OF VISITS
Headache	4
<b>Feverish condition</b>	<b>6</b>
Hotness in the body	12
Pains in the chest,ribs,stomach and body	3
Itching in the body	4
Discharge	11
Weak erection	7
Quick ejaculation	5
Low sperm count	10
Low libido	9
No ovulation	21
High blood pressure	15
Irregular menstruation	8
Vaginal discharge	4
Hormonal imbalance	14
<b>TOTAL:</b>	<b>133</b>

**Figure 7: Sample Report Showing Frequency Of Ailments Cases To A Centre For A Specified Date Period**



**Figure 8: Sample Report Showing The Corresponding Chart For The Number Of Visits To A Centre By Patients On Ailment Basis**

#### 4. CONCLUSION

In this paper, an architectural design of an analytical Trado medical patient data was formulated leading to the design and implementation of a Trado-medical patient data analytical system. This system optimally create a simplified analytical menus required in analyzing of patient data in trado medical centre, resulting to improved record keeping, report generations and documentation. The developed system makes it possible for Trado medical owners to maintain and analyze patients' data in order to understand the importance, effectiveness of the various traditional medicines, applications and dosage.

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