Electronic Health Record (Ehr) Security And Implications For Cybersecurity

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Abstract: The central purpose of the current investigation is to develop an effectivemedication management system to control antibioticdrugselling in Nigeria, which will be transparent, accurate andensure quality with efficacy. Besides, the eMM system will beimplemented in such a way so that it can be easily accessed bygeneral users from smart devices while ensuring all securityperspectives. Although improving medicationmanagement in Nigeria is the crucial objective of the Nationaldrug policy-2016, there is no effective administration system foreffective regulatory control. Our proposed e-Medication Managementsystem (eMM) seeks to support policies and objectivesby improving the access and quality of medicines information. here, malpractice by doctors, over-counter drug availability, and irrational medications can be controlled entirely through our system. Also, through this project implementation, a substantial nexus among patients, physicians, and drug sellers will be established, and promote the fair exercise of digital medical practice.

1. INTRODUCTION

Generally, the success of e-administration depends on howusers of the system accept it as a service [1]. Implementationof an eMM will require changes in workflow. Since e-Medication Management system is an entirely new idea inthe perspective of Nigeria, it is essential to understand theservices needed, degree of acceptance, prospect and challengesto implementing the system. To understand the necessity of e-medicationsystem, we run a paper-based end-to-end surveythat covers three basic entity of the system (i.e. doctors,patients and Medicine sellers) [2]. From Patients survey,it is marked that 40% take antibiotic medicine by takingprescription from doctors and 60% take antibiotic medicationwithout taking prescription from doctors due to sufferingcough and fever most of the time [3]. Every aspect requires efficient management (Abdul Jalil et al., 2021; Mohd Noh et al., 2021; Mustafa et al., 2021; Roszi et al., 2021; Tumisah et al., 2021). If it is managed well, various problems can be avoided (Irma et al., 2021; Suzana et al., 2021; Rohanida et al., 2021; Nazrah et al., 2021; Shahrulliza et al., 2021)
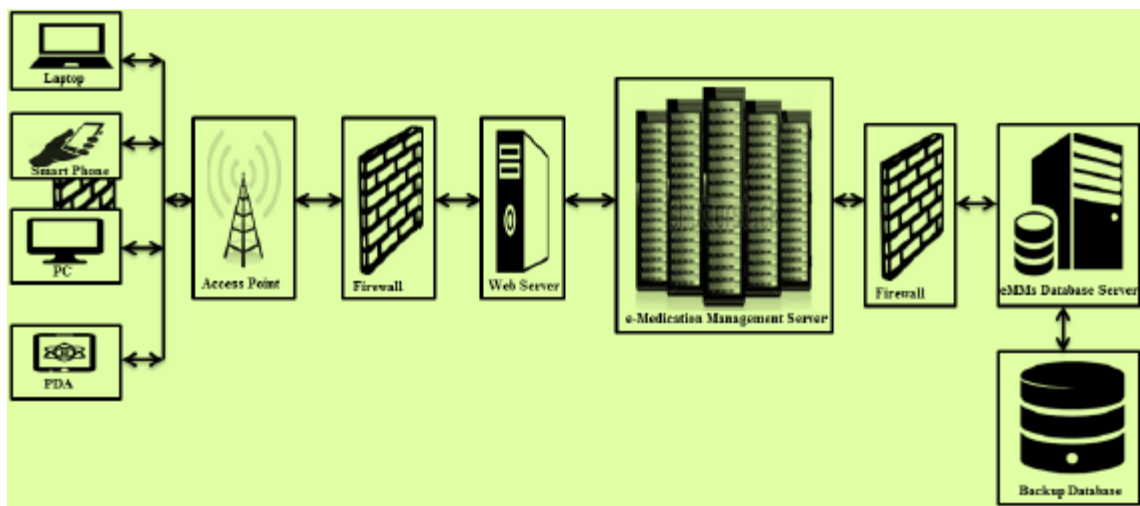
Besides, from doctorssurvey, it is evident that 55% prescribe antibiotic medicine insuspected cases and 45% prescribe medicine after confirmingdisease, which is a clear indication of irrational medication.Most of the doctors, patients, sellers opine that in order toavoid serious health hazard, patients should stop antibioticdrug self-medication, and they also blame that over the counteravailability of the antibiotic drug is also a major reason ofirrational medication [4, 5]. At the end of the survey,we observed that most of them (patients, doctors, medicinesellers) feel to use an antibiotic e-administration system thatwill ensure fair antibiotic medication practice. All aspects require effective leadership and management

(Mohd Arafat et al., 2021; Sumaiyah et al., 2021; Hifzan et al., 2021; Shahrul et al., 2021; Helme et al., 2021)

2. METHODOLOGY

The proposed system is based on forcing the user except the patientto register the real identity to ensure transparency in medicalpractice. This system has Databases, managed by the systemauthority as well as Database Manager. The whole system comprises of two types of users: 1) Who usethe system 2) Database Management Authority. Through thisprocess, the eMM system will help fair medical practice.

To communicate and present findings of clinical research, scientific writing has been used. However, the approach is time-consuming on the part of the researcher. Notably, Web applications seeking to steer improvements in the writing process in a systematic way are limited. In this study, an application seeking to separate various tasks concerning scientific writing to obtain smaller components is proposed. The study's specific objective is to offer a mechanism in which sections of any given text book could be assigned to various specialists. Therefore, a classic lifecycle development technique and Java language aided in manuscript architect building. To achieve the economy and simplicity of movements, there was the design of an interface. Through formal field observations and usability tests, there was the evaluation of system usability. Every organization values perfect management in ensuring success (Farah et al., 2021; Syahrul et al., 2021; Quah et al., 2021; Ahmad Syarifuddin et al., 2021; Jumiah et al., 2021). In the findings, it was discovered that the proposed system yields excellent integration and usability with other experienced researchers' writing habits. In summary, the proposed manuscript architect was found to be promising in terms of scientific text preparation. The eventual conclusion was that in situations requiring interdisciplinary work, scientific writing through virtual writing is effective.

In scientific medical literature, most readers acknowledge the highly specialized nature of research prose [1]. In particular, scientific writing seeks to ensure that the explicitly stated ideas and exact information are transferred [2]. The intention of scientific report writers can be seen to lie in the quest to ensure that the most precise meanings are conveyed in a manner that is logically coherent, seeking further to achieve the function in the fewest words possible [3, 4]. However, even as scientific writing is distinct and important, software solutions that

strive to facilitate manuscript writing processes are yet to receive in-depth analyses [5], especially in situations involving the presence of virtual interdisciplinary groups. In this study, a Web application Manuscript Architect is proposed. The proposed system is that which is out to aid in scientific manuscript writing among virtual interdisciplinary groups.The success of something depends on good and efficient management (Mohd Ali et al., 2021; Parimala et al., 2021; SitiJamilah et al., 2021; Nor Fauziyana et al., 2021; Noel et al., 2021).

3. RESULTS AND DISCUSSION

In our system, there are threetypes of user. They are medical practitioners (i.e. doctor,Medical technicians), patient and seller. In our system, thePatients registration process is optional keeping in mind aboutemergency medical service, but the doctor and medicine sellermust be registered user to interact with the whole process ofprescription service. Our system will force users to use realidentifications. There will be a verification technique in oursystem to check whether the user account holder uses theproper identity or not. Then the system will automatically notify them to useproper identity to prevent from being suspended. After completingthe registration process, successfully doctor can viewmedical history (i.e. disease history, previous prescriptions,etc.) and prescribe medicine to the patient through our drugadministration system. The best way is to do efficient management (Ahmad Shafarin et al., 2021; Junaidah et al., 2021; Farah Adibah et al., 2021; Ahmad Shakani et al., 2021; Muhamad Amin et al., 2021).

In order to ensurefair practice, the system will be under proper authority.The authority will periodically check the user's activity. If auser of the system wants to complain about any illegal activity,then he/she will enter into our proposed system and paste thatid of the illegal practitioner in the mentioned box. Then hehas to write a description of why he complains against the ID.Then he has to click the report button. Finally, the reportedcomplains will be saved in the system Database. Here onething should be mentioned that only registered and valid IDholder can report their complaints in our system model.

Authorizations to manufacture, import, distributeor sell antibiotic drugs in Nigeria are only being grantedfor registered antibiotic drugs which are included in the Nationalhealth database. In our system, there will be an updatedlist of an antibiotic drug authorized by the ministry of healthNigeria. Though our system only registered antibiotic drugcan be prescribed and sold. For special reasons and afterreceiving the opinion of the health ministry, the Minister mayauthorize the distribution of un-registered antibiotic drugs notyet included in the database. Our system contains the facilityto update the antibiotic drug list.This demonstrates that the importance of something being managed well (Santibuana et al., 2021; Nor Diana et al., 2021; Zarina et al., 2021; Khairul et al., 2021; Rohani et al., 2021; Badaruddin et al. , 2021, Abdul Rasid et al., 2021).

In the e-Medication Management (eMM) system scenario,each asset has huge importance as long as the system mustprovide services with high reliability and guarantee the confidentialityof the data. We have secured the eMM system byapplying security mechanism I) Availability II) Authenticationand Access control III) Confidentiality IV) Non-repudiation atdifferent layers.

Availability: Since this system is an emergency serviceportal, it must be available to the users at all time fromeverywhere. System availability is ensured by a robust setof servers. Besides load balancer technology is integratedto ensure availability of service as per user request. Inaddition, a firewall is implemented to filter out un-usualtraffic in and out from the system.

Authentication and Access Control: In order to provideauthentication and access control, we divide this scenariointo two cases.

General user case: Our System will force the usersto use real identifications. There is proper verificationtechnique using National ID, Birth registrationnumber, driver license number, passport number forthe general user, BMDC number for doctors and drug license number for medicine sellers to check whetherthe user account holder use the proper identity ornot.Then the system will automaticallynotify them to use proper identity to prevent frombeing suspended. Thus fake account holder will befiltered and reduce misuse of our system. If a patientand doctors activity related to medical service seemsunusual in their account then they can complainagainst them(doctor and patient vice versa) in oursystem Besides access control is another securityapproach science our system database contains sensitivedata of users. In our system, we use a role-basedaccess control mechanism for users.

From the topic and industry selection, this study focuses on cybersecurity (as the technology) and the software industry (as a sector of interest). Thus, the study seeks to give insight into several aspects concerning the presence, operation, and functionality of the cybersecurity technology in the software industry. According to Al-shukri, Lavanya, Sumesh and Krishnan (2019), cybersecurity refers to a state in which systems are protected against electronic data use by unauthorized individuals, groups, or criminals. On the other hand, Farris, Taleb, Khettab and Song (2019) stated that the software industry constitutes businesses for the publication, maintenance, and development of software via various business frameworks, including cloud-based systems (such as AaaS, MaaS, IaaS, PaaS, and SaaS) and maintenance or license-based systems (such as on-premise platforms). In this study, the motivation is to unearth the interplay between the selected technology and the selected summary – relative to various parameters that are explained in the sub-sections that follow.

Indeed, one of the key components entails a secure email gateway (SEG). According to Al-shukri, Lavanya, Sumesh and Krishnan (2019), SEG as a cybersecurity appliance is responsible for the provision of anti-malware and anti-spam protection. For corporations, there is the incorporation of SEG on top of Email Servers and aids in the pre-screening of all outbound and inbound data, averting any malware-infected attachments, annoying marketing emails, and spear-phishing campaigns (Farris, Taleb, Khettab and Song, 2019). Furthermore, SEG offers email encryption to ensure that all outbound emails are delivered securely (Giannakas, Papasalouros, Kambourakis and Gritzalis, 2019).

Emergency User case: In case of emergency use,if a user has no account he/she can take medicalservice using his any unique ID(Ex: national ID,Birth certificate number, Passport number, driverlicense, student ID etc.). In this case, the doctor willgenerate a prescription ID for the patient to prescribemedicine and print a prescription with a unique ID.Using this prescription ID, the patient/ relative of thepatient can take medicine from registered medicinestore. In order to handle misuse of the emergencyservice, the system will contain the facility to checkthe frequency of taking medicine by the patient from the different doctor in the same day using the same ID. Using emergency medical service, apatient can take medicine from doctors not more thann (n=2 or 3 or 4) times for the same purpose. Ifhe/she requires medicine further, he/she must haveto register as a valid user of our system through theproper registration process and must require specialauthorization from doctors.

4. CONCLUSION

In summary, the main objective of our research is to develop an effectivemedication management system to control antibiotic drugselling in Nigeria, which will be transparent,

accurate andensure quality with efficacy. Our proposed electronic medication management (eMM)system can help to achieve higher standards of care with betterpatient safety. We have developed a centralized eMM systemwith all medical entities(Doctors, Patients, and MedicineSellers) to give faster service to the patients by replacingpaper-based medical records through eMM where the privacyof all entities have been ensured by role-based access.Malpractice by doctors, over-counter drug availability, andirrational medications can be controlled entirely through oursystem. Also, through this project implementation, a substantialnexus among patients, physicians, and drug sellers will beestablished, and promote the fair exercise of digital medicalpractice.

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