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Design And Implementation of Secured Personal Data Servers of Patient Medical Records in Nigeria (A Case Study of General Hospital, Lagos Nigeria)

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Abstract

This research is based on the design and implementation of Secured Personal Data Server of Patient Medical Records in Nigeria. It is built upon the emergence of portable data server (PDS) with well secured devices that combines the security of smart cards with embedded software devices and storage capacity of NAND Flash Chips which is a novel model that is in compliance with healthcare standards in relation to data and service user-friendliness. In order to access a resource, users must meet the regulatory conditions of the policy class which is in conformity with organizational standards as stipulated by the Federal Ministry of Health in Nigeria that regularize healthcare policies. The system was designed to be flexible and adaptive in order to allow users pass on their rights of access to other users, permission given for right of access can be withdrawn based on the stipulated restrictions that have been defined in the program.

The problem of inadequate healthcare facilities in producing sustainable development in Nigeria, breaches of security, delivery, confidentiality, ethical risk issues and privacy risks incurred by centralization due to privacy violations that arise from negligence, abusive use, internal and external attacks. The PDS with current server-based approach, cryptography-based and server-side secured hardware is capable of dismissing these major problems. The research specific objectives are to provide the main functionalities of a database engine that will be interoperable with existing data sources and allow secured data sharing protocols by establishing control of how users personal data are shared with others and creating a way of harmonising patient's data from other hospitals in the country as well as beyond and also allow interoperability of clinical systems. This study adopts authentication and authorization method at inter / intra organizational levels for the security and delivery of patients' clinical data. A stratified database with indexing and hashing techniques that can change strata without incurring a dramatic number of alterations where precomputed, relational context and Queries are executed in a pure pipeline fashion.

The system will cut down substantially the cost of travelling abroad for medical consultations, which runs into billions of U.S. dollars or Naira (the Nigerian currency), especially given the poverty and related economic difficulties that Nigeria and other developing world countries face.
The PDS devices are expected to assist doctors and clinicians in reviewing patients' medical history and status prior to a consult or in reaching a diagnosis. It is also expected to provide support regarding timely referrals to and location of healthcare facilities for parallel care as needed.

Keywords: accessibility, authentication, authorization, confidentiality, electronic records, interoperability