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A patient information management system (PIMS) for health care: A Case of Kampala international university teaching hospital, Ishaka- Bushenyi, Uganda

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Abstract
The purpose of this research project was to investigate the current Patient records Management System in Kampala University Teaching Hospital and subsequently design and develop a Computerized Patient Information Management System that would support medical personnel to collect, process, stores, retrieve and disseminate patient information, and improve reporting for meaningful use by the managers in decision making. To achieve the objectives of this study, 55 respondents who comprised of doctors, records staff, nurses, patients, clinical officers and administrative staff. Information technology developments for health care providers have been seen for years as the perfect supporting tools to assist in the prevention and management of these conditions. Therefore, the study was designed to take lessons from health and information systems literature and existing experience in successful implementations at Kampala International University Teaching Hospital. Case study design was the methodology chosen for this study, interviews, and observation; primary data collection methods were used. Field findings showed that the current manual system in Kampala International University Teaching Hospital had short comings like subjecting patients to long queues, lack of privacy for patient information, lack of efficiency and security. As result, this study came up with a computerized patient information management system for health care that addresses the bottle necks is the manual system.

Keywords: kampala international university teaching hospital (KIUTH), private not-for-profit (PNFP)

Introduction
Many of the developing countries lack resources and good healthcare infrastructure to meet health care demands, (Knapp & Boulton, 2006) [3]. Most of these social service centers, hospitals, and clinics have large repositories of data/ information about patients and have hard time in keeping these records safely and properly, and to interpret the meaning of various figures that they keep in their records (Nicole, 2007). Most hospitals and other health centers in Uganda have a paper-based file system of records management (Alter, 1980) [1], a case in point is Mulago Hospital. As the national referral hospital, Mulago deals with the records of hundreds of patients from all over Uganda every day. Uganda is one of the developing countries affected by lack of personnel and good medical facilities. Hospitals and health centers in Uganda rely majorly on paper-based information systems to manage patient information. While government, legal, and healthcare entities have a strong historical records management discipline, general record-keeping of hospitals, health centers, dispensaries and clinics has been poorly standardized and implemented, (Polack, 2009) [5]. KIUTH is a private not-for-profit (PNFP) hospital established in 2004 and officially started in 2007. The hospital is located in Ishaka town, Bushenyi district and serves a population of about 1.5 million people. KIUTH was established in response to a need and it is the nation's first private teaching hospital, combining the principles of the philosophy of moral treatment, with a modern approach to the care of the less privileged. The hospital is committed to excellence in health and wellbeing for women, infants, and all within its care, by attaining and maintaining the high international standards in treatment, education, research and community outreach, (KIU Marketing Office, 2010).

Problem Statement
The importance of health care is to save lives of patients by improving on service delivery. Poor health care service delivery can lead to, long queues in hospitals, delayed decision making, patient, poor record keeping of patients' records and this can lead to patients turning away from the hospital due to inefficient services. This is due to manual methods of data gathering, storing and processing of patient information, and thus affects the speed at which health care services are offered. This was the case at KIUTH. The manual system lacked efficiency and effectiveness to gather, store, retrieve, analyze and disseminate patient information, for timely and effective decision making. Information flow was through many hands, patients' files which can easily get lost or destroyed. This information flow is not favorable to most of the processes that take place inside the hospital, like registration, retrieving patient information, generating reports, and ensuring security of information at all times. Patients spent a lot of time queuing up to register and to see a doctor; which is a loophole in the system. Integration and generating reports on patient activities take a lot of time and this in time affected the way decisions were made by management; mostly

at the time when informed decisions had to be made in time, (Isoke, 2011) [4]. The use of information systems will improve the quality, safety, and efficiency of health care, by allowing health care providers to collect, store, retrieve, and transfer information electronically. Therefore the patient information system will help in reducing on the problems faced by health care

Research Methods

To investigate the current Patient records Management System in Kampala University Teaching Hospital and subsequently design and develop a Computerized Patient Information Management System that would support medical personnel to collect, process, stores, retrieve and disseminate patient information, and improve reporting for meaningful use by the managers in decision making. Descriptive field survey and traditional water fall method of system development life cycle, (SDLC) was used in the design and construction of the system. Purposive and Random sampling technique was used to locate 44 respondents KIUTH. All the study respondents had equal chances of being included in the sample. The simple random sampling was used with a homogenous population, that is, one composed of members who all possess the same attributes that the researcher was interested in measuring.

System Development and Implementation

The diagram below shows a general view of how the new computerized system would work, depicting the major entities

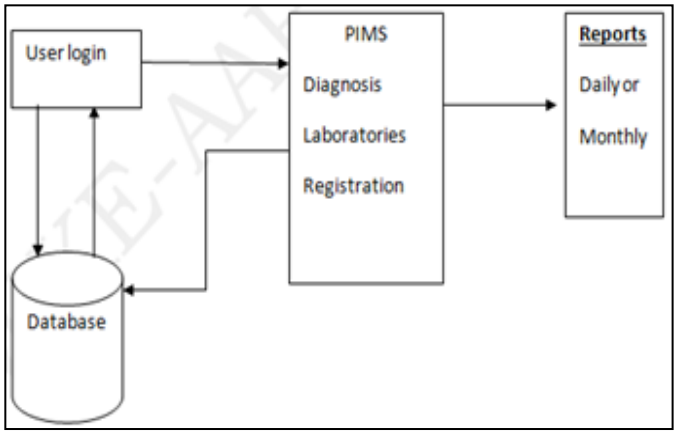

Fig 1: Architectural design of the new

System

The diagram below shows the flow of data through the proposed system. It depicts the flow of information and the transformations that are applied as data moves from input to output.

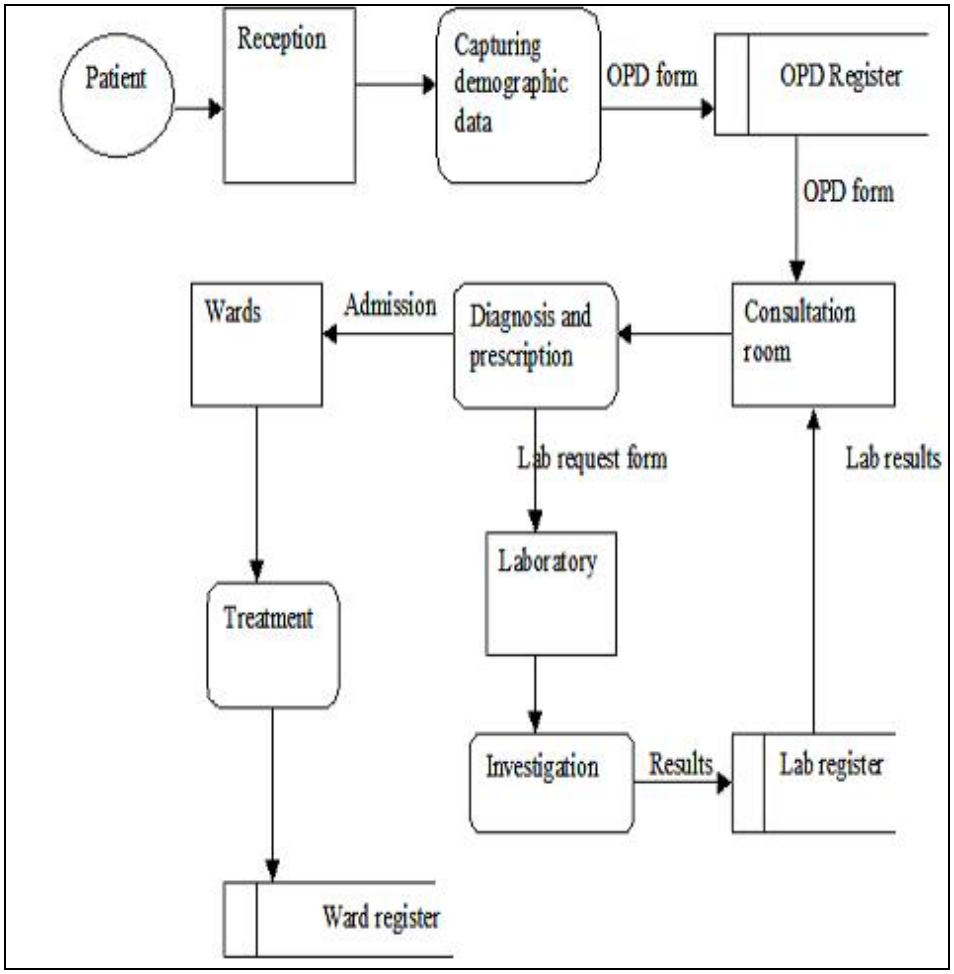

Fig 2: Logical design of the new computerized system

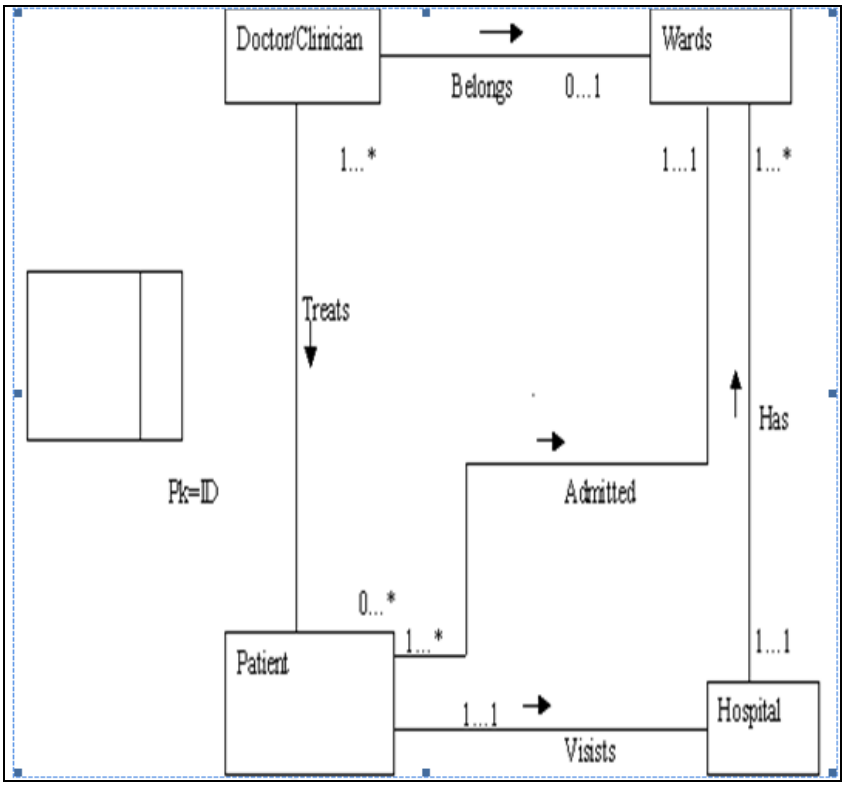

Fig 3: Database logical design with entity relational diagrams

Fig 4: The user interfaces

Fig 5: The Login Screens

Fig 6: The main menu window

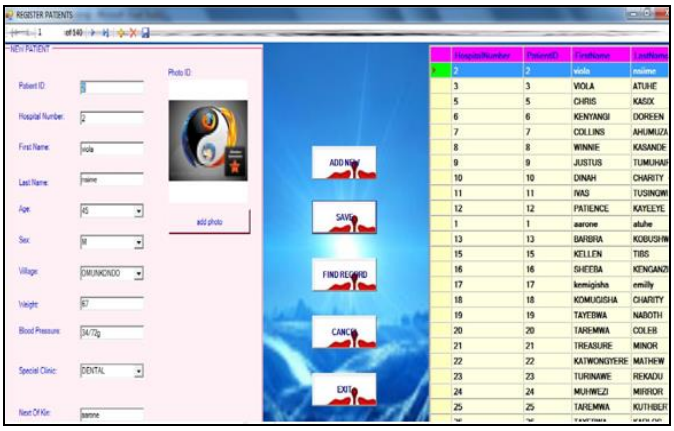

Fig 7: Patient registration window

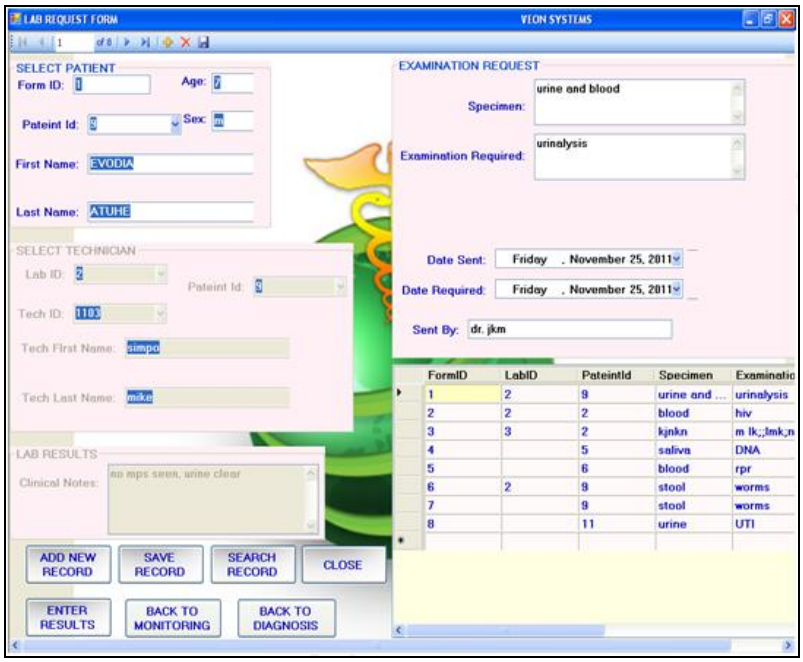

Fig 8: Laboratory request form and results window

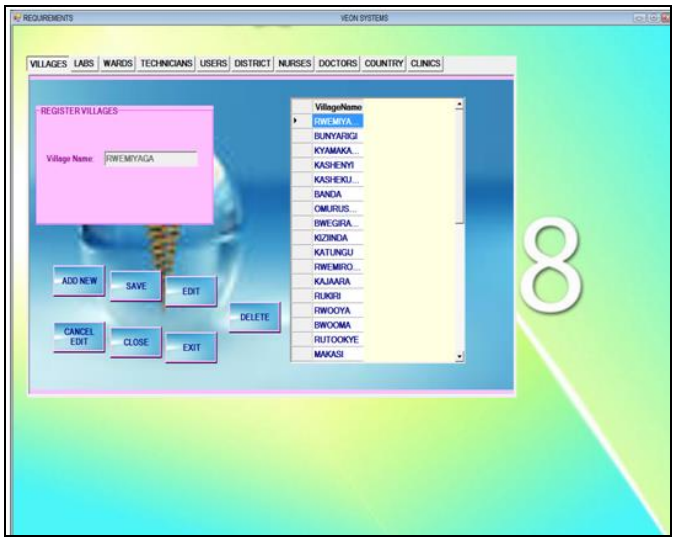

Fig 9: Database Requirements Windo

Conclusions

The study established that Electronic Health Record presents a great opportunity for the health services of developing countries in the enhancement of the quality of healthcare delivered, the opportunity for early detection of epidemics and clinical audits. This research project also sought to find the information infrastructure state in KIUTH, the challenges of introducing EHR in KIUTH, the benefits of EHR to KIUTH and what sort of data an implemented EHR system would capture. Some of the challenges of EHR implementation that I identified are the initial huge startup costs, poor computer skills of the healthcare professionals, poor maintenance culture, and people embedding political meaning (s) to the system. The weak state of information infrastructure at the hospital will be another challenge in an EHR implementation. EHR could potentially reduce waiting times for patients, reduce the cost of the hospital‘s operations, improve interdepartmental communication and collaboration, provide an opportunity for sharing best practices among physicians

within KIUTH, and enhance better resource allocation. The data an EHR will primarily capture will be patients' demographics, care plans, laboratory results, billing and NHIS claims information.

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