Radio Frequency Identification based Drug Management and Monitoring System: A Case of Public Hospitals in Tanzania,

Review Paper

Prisila Ishabakaki
Department of Communicational Science and Engineering
Nelson Mandela AIST
Arusha, Tanzania

Shubi Kaijage
Department of Communicational Science and Engineering
Nelson Mandela AIST
Arusha, Tanzania

***Abstract*— RFID is an automatic identification technology that enables tracking of people and objects. Recently, the RFID technology has been deployed in hospitals for patient and equipment tracking, surgical equipment monitoring, medication monitoring, and improving health record access in emergency cases. The pharmacy department in public hospitals faces challenges due to manual record keeping and inventory management, which result in theft and diversion of the drugs by unfaithful workers. This work identifies the potentials behind use of the RFID technology in addressing these challenges. The paper focuses on reviewing the current situation at the hospitals to identify loopholes causing these problems and later suggests the solution based on RFID to counteract the challenges. The case study methodology is used where 5 public hospitals in Tanzania were visited to obtain data based on real situation. It was discovered that the drug management and monitoring process is done manually, involves paper based record keeping, manual counting of stock during each staff shifting time, which is hard to track in case of any loss. Therefore, there is need to develop a technological solution to manage the process and secure the drugs.**

Keywords: RFID, UHF Radio Frequency, Drug management and monitoring, public hospital

I. INTRODUCTION

The health sector uses different technologies in healthcare services delivery, including the Radio Frequency Identification (RFID). The RFID is an automatic identification technology that enables tracking of people and objects [1]. It utilizes electromagnetic waves for transmitting and receiving information stored in a tag to or from a reader [2]. A typical RFID system is made of at least three components: the radio frequency transponder (tag), the reader, which is basically a transceiver controlled by a microprocessor used to inquire a tag, and client software to communicate with a reader through a reader protocol, collecting, storing and/or processing codes retrieved from the tags.

Public hospitals are all healthcare service providers owned and operated by the government to serve the citizenry. Pharmacy departments at hospitals coordinate drug orders from suppliers and distribute the drugs to patients and other hospital units. In Tanzania, all public hospitals receive or purchase drugs/medications from the Medical Stores Department (MSD) and few drugs from other suppliers or distributors. The pharmacists in healthcare institutions are increasingly burdened with handling complex manual work involving record keeping and inventory management as hospitals serve a large number of patients every day [3].

The pharmacists in hospitals are responsible for a range of work activities including filling in patients' medical prescriptions, daily maintenance of drug inventories making sure that the hospital has enough quantity for each drug for administering to patients, accounting for the hospital's purchase and usage of drugs and for provision of drugs to individual patients, and distributing the drugs to the appropriate nursing stations and wards within the hospital to suit each station's daily demands. Hospital pharmacists are also responsible for tracking of drug lot numbers and expiration dates to get rid of expired drugs, and reporting to the hospital management on all matters concerning drug ordering, dispensing and delivery.

However, there have been several instances reported on theft and loss of drugs in hospitals. For instance, the MSD's Internal Audit investigation report of October 2007 indicated that medicines valued at USD 133,000 (163.2 million TZS) were missing or stolen [4]. Another reported case [4] revealed that some medicines meant for public hospitals have been diverted to private hospitals and pharmacies. Our preliminary survey of the drugs market discovered that medicines intended for free dispensing in public health facilities are sold at varying market rates in the private sector. These drugs may have been acquired through donations by countries or manufacturers as part of aid programs, or sold at very good discounts to support public health service delivery in Tanzania [5]. Our study revealed loopholes in the information management system in relation to pharmacists' duties and responsibilities of purchasing, distribution and dispensing of medicines, which result into some medicines being channeled from the public

http://sites.google.com/site/ijcsis/
ISSN 1947-5500