**MAKERERE UNIVERSITY BUSINESS SCHOOL**

**DEVELOPING A COMPUTERIZED HOSPITAL MANAGEMENT SYSTEM FOR ZION HOSPITAL IN NATEETE, KAMPALA**

**BY:**

|  |  |  |
| --- | --- | --- |
| **NAME:** | **REG NUMBER:** | **PHONE NUMBER** |
| **KALUNGI DANIEL** | **18/U/1028/PS** | **0753178630** |
| **BABU FEISAL** | **17/U/12216/EVE** | **0755227940** |
| **CHEMUTAI GLORIA** | **19/U/1903/PS** | **0751674783** |
| **NALYAKA BRENDA** | **19/U/2311/EVE** | **0783731266** |
| **NUWATEKATEKA SYLIVIA** | **18/U/3613/EVE** | **0784902737** |
|  |  |  |

**SUPERVISED BY:**

**MS. FATINAH NAKABONGE**

**A Research Proposal submitted to Makerere University Business School in partial fulfilment for the Award of the Degree of Bachelors of Business Computing of Makerere University**

**DECLARATION**

We as group 35, declare that to the best of our knowledge this proposal is our original piece of work and has never been published or submitted for any award at any University or higher learning institution.

|  |  |  |
| --- | --- | --- |
| **NAME** | **REGISTRATION NUMBER** | **SIGNATURE** |
| **KALUNGI DANIEL** | **18/U/1028/PS** |  |
| **BABU FEISAL** | **17/U/12216/EVE** |  |
| **CHEMUTAI GLORIA** | **19/U/1903/PS** |  |
| **NALYAKA BRENDA** | **19/U/2311/EVE** |  |
| **NUWATEKATEKA SYLIVIA** | **18/U/3613/EVE** |  |

**DATE**………………………………………………………………………………

**APPROVAL**

This proposal has been submitted with my approval as supervisor and my signature is here appendix:

Signed………………………………………………………. Date………………………………………………………………….

Ms Fatinah Nakibonge

Makerere University Business School

# **Table of Contents**

[**1.** **Table of Contents** 4](#_Toc115273956)

[**1.** **INTRODUCTIONS** 6](#_Toc115273957)

[**1.1.** **Background to the study** 6](#_Toc115273958)

[**1.2.** **Problem statement** 6](#_Toc115273959)

[**1.3.** **Purpose of the study/General objective** 7](#_Toc115273960)

[**1.4.** **Specific objectives of the study** 7](#_Toc115273961)

[**2.** **LITERATURE REVIEW** 9](#_Toc115273962)

[**2.1.** **Manual Hospital Management System** 9](#_Toc115273964)

[**2.2.** **Computerised Hospital Management system** 10](#_Toc115273965)

[**2.3.** **Designing a Hospital Management System (HMS)** 10](#_Toc115273966)

[**2.4.** **Developing and testing a Hospital Management System** 11](#_Toc115273967)

[**3.** **RESEARCH METHODOLOGY** 12](#_Toc115273968)

[**3.1 Introduction** 12](#_Toc115273969)

[**3.2 Research Design** 12](#_Toc115273970)

[**3.3.** **Study Population.** 12](#_Toc115273973)

[3.4 **Sources of data** 12](#_Toc115273978)

[**3.5** **Requirements elicitation techniques** 12](#_Toc115273979)

[**3.5.1** **Interviews** 12](#_Toc115273980)

[**3.5.2** **Prototyping** 13](#_Toc115273981)

[**3.6** **Systems analysis and design** 13](#_Toc115273982)

[**3.6.1** **Planning and Analysis phase:** 13](#_Toc115273983)

[**3.6.2** **Design phase:** 13](#_Toc115273984)

[**3.6.3** **Implementation phase:** 13](#_Toc115273985)

[**3.6.4** **Testing phase:** 14](#_Toc115273986)

[**3.7** **System design Approach** 14](#_Toc115273987)

[**3.8** **Limitations of the project** 14](#_Toc115273988)

[**3.9** **Ethical Consideration:** 14](#_Toc115273989)

[**APPENDICES** 14](#_Toc115273990)

[Proposed Research Budget. 14](#_Toc115273991)

[**Appendixes ii: Interview Guide.** 15](#_Toc115273992)

[**References** 17](#_Toc115273993)

# **INTRODUCTIONS**

## **Background to the study**

A computerized Hospital management system is a computer system that helps manage the information related to health care and aid in the job completion of health care providers effectively. (Sanjana 2018). The computerized Hospital management System allows the ability to optimize and digitize all the processes within the hospital, which helps to improve customer service, reduce process costs, streamline the search of medical records, bills, patients, doctors among others, thus having a database of each module implemented (Rupp, 2019).

Zion Hospital is a small hospital located in one of the highly populated areas of Kampala which is Nateete in Rubaga Division. The Hospital has been in existence for the last 14 years and it serves a big population in the area as it is one of two hospitals that are immediate for a big number of the residents in the zone where it is located. The hospital has a small number of staff members which includes eight nurses, six doctors, two laboratory technicians and two administrators which gives a total of eighteen members of staff and an average number of 120 patients a month. Zion Hospital has a manual system of hospital management and faces the following problems; misplacement of hardcopy files which contain patient information, a hectic and long process of processing patient documents, miscount of drugs and equipment and difficulty in tracking payment invoices.

This study seeks to design and implement a Hospital management system that will help reduce the problems faced at Zion hospital

## **Problem statement**

Hospital management system is a computer system that helps manage the information related to health care and aids in the job completion of health care providers effectively (Sanjana, 2018). Currently however, Zion Hospital has a manual system of hospital management and faces the following problems; misplacement of hardcopy files which contain patient information, a hectic and long process of processing patient documents, miscount of drugs and equipment and difficulty in tracking payment invoices. Zion Hospital risks losing patients documents, making wrong accountability of drugs and equipment, and making mistakes in patient documents. A computerised hospital management system has potential to automate the entry of patients information into a database which keeps the patient documents together, make the entry of information of patients easy and fast and easily track inventory (drugs and equipment).

## **Purpose of the study/General objective**

The main objective of the study is to develop a Hospital Management system that will enhance internal operations and data e.g., making online appointments, admission of new patients, discharge of patients, assigning a doctor to the patient and computing the bills.

## **Specific objectives of the study**

* To examine and analyse the existing hospital management system at Zion Hospital so as to identify the existing weaknesses and establish the requirements necessary to develop a new computerised hospital management system.
* To review literature about computerised hospital management systems.
* To design and develop a high level new computerised Hospital management system.
* To test the Computerised system that has been developed to ensure that it meets the requirements.
* To implement the computerised hospital management system.
  1. **Scope of study**
     1. **Subject scope.**

This research study will concentrate on the fields of healthcare management and Information systems. It will seek to examine how a Computerised Hospital management system can best enhance the internal operations within the organization.

* + 1. **Geographical scope**

The study will take place at Zion Hospital Nateete and it was chosen due to its ease of access, enabling the acquisition of reliable information. Additionally, the area in which its located is one of the highest populated areas in Kampala which amounts to a high recorded number of visits per day compared to other low populated areas.

* + 1. **Time scope**The study will be carried out from July 2022 to September 2022
  1. **Significance of the study**
* It will reduce problems faced by Zions manual system.
* It will be of significance to the researchers as they will gain knowledge of conducting research.
* The study will be used as a source of literature for future studies about Hospital Management Systems.
* Upon completing the computerised hospital management system, it will ensure easy and reliable access to patient data.
* It will ensure cost efficiency by cutting down on manual labour by automating the processes as well as saving on storage and related costs.

# **LITERATURE REVIEW**



## **Manual Hospital Management System**

Records-keeping is the process of making an entry or storing of information on patient records in order to promote and maintain patient safety (Taiye, 2015). A manual system is a book-keeping system where records are maintained by hand, without using a computer system (CPE courses & Books, 2022). These systems suffer from a high error rate, and are much slower than computerized systems. Manual systems put pressure on people to be correct in all details of their work at all times, the problem being that people aren’t perfect, however much each of us wishes we were. With manual systems the level of service is dependent on individuals and this puts a requirement on management to run training continuously for staff to keep them motivated and to ensure they are following the correct procedures (Breitmer, 2015). He continues to list the following as disadvantages of using a manual system; Inconsistency in data entry, room for errors and mis-keying information, staff training costs, dependency on good individuals, reduction in sharing information and customer services, time consuming and costly to produce reports, lack of security and duplication of data entry. It takes more effort and physical space to keep track of paper documents, to find information and to keep details secure. When mistakes are made or changes or corrections are needed, often a manual transaction must be completely redone rather than just updated. With manual or partially automated systems information often has to be written down and copied or entered more than once. Another impact of manual systems is on Customer service. Customer queries can be difficult to respond to as information is stored in different places and may even require that you find the right person before being able to respond. Good nursing practice requires detailed record-keeping that is comprehensive, timely and accurate. Without complete recording there is no evidence to prove that care was provided to the patient, and in nursing practice there is a saying that ‘what is not recorded has not been done’ (Marinič, 2015). Systemisation and automation can reduce the amount of duplication of data entry.

## **Computerised Hospital Management system**

Hospital management system is a computer system that helps manage the information related to health care and aids in the job completion of health care providers effectively (Sanjana, 2018). They are a means to create legible and organized patient data and to access clinical information about individual patients. Healthcare providers introducing modern technologies have always struggled with managing high patient numbers, tracking inventory, allocating finances, and allocating resources efficiently. It’s especially challenging for medical organisations to keep all of these processes under control and operate effectively. Therefore, hospital management software (HMS) is in high demand today since it helps medical facilities cope with these challenges and helps to better ensure streamlined hospital management (Sheremetov & Diachenko, 2022). Automated hospital management systems are intended to complement existing (often paper based) medical records which are already familiar to practitioners. Patient records have been stored in paper form for centuries and, over this period of time; they have consumed increasing space and notably delayed access to efficient medical care. In contrast, automated hospital management system store individual patient clinical information electronically and enable instant availability of this information to all providers in the healthcare chain and so assist in providing coherent and consistent care. The advantages of automated hospital management system can be summarized according to (Ranpura, 2021) as achieving quality rating, better revenue management, avoiding errors, improved data security, improved clinical decision making, establishing a hospital as technically advanced and creating a high level of trust in systems and processes.

## **Designing a Hospital Management System (HMS)**

Inorder to design the architecture of hospital management software one should follow the following steps; First, identify processes you want to facilitate and automate with your hospital management solution, Decide on the feature set required to implement these processes, Finalize the specific tech stack you’ll need to implement this functionality, Identify what platforms you want to create (mobile, web, or cloud.), Create a detailed roadmap of your HMS, Double-check if your HMS is adapted to the hospital’s IT infrastructure, Ensure that you elicited and documented all the requirements from medical staff, Work on user interface design and create an intuitive user experience, Keep a responsive approach in mind, Start small, then scale. Build an MVP to test your product and grow gradually. To develop a hospital management system one needs to define the hospital’s business needs and goals, set up security measures, meet regulatory compliance and standards requirements, and develop an efficient user interface/user experience (UI/UX) (Sheremetov & Diachenko, 2022).

## **Developing and testing a Hospital Management System**

Since healthcare is a highly specific industry, building hospital management software requires a diverse array of custom features seldom used in other spheres. The essential features required to build an HMS can be divided into two main directions: oriented on management tasks, while the second focuses and patient care. Sheremetov & Diachenko (2022) emphasise HMS management-oriented features as doctor timetables, operation room management, ward management, pharmacy management, inventory and purchase management. They continue to list HMS patient-oriented features as patient registration, patient admittance information, patient billing and insurance, emergency care module, pharmacy information for patients, patient notification. Bogdan (2019) lists the following as Hospital Management Software Features; Patient Registration and Electronic Health Records/Electronic Medical Records, Appointment and Scheduling, Billing and Financial Management, Doctors Information, Inventory Management, Laboratory Management, Statistics and reports, Support, and Telemedicine solution.

# **RESEARCH METHODOLOGY**

## **3.1 Introduction**

This chapter covers the study design and approaches that are to be used in the specification of requirements, developing, testing and implementation of the proposed system, study population, sample size data collection, presentation and analysis procedures and tools and limitations of the proposed project.

## **3.2 Research Design**

Research design refers to the overall strategy that you choose to integrate the different components of the study in coherent and logical way. Thereby ensuring you will effectively address the research problem; it constitutes the blue print for the correction for collection, measurement, and analysis of data (Claybaugh, 2020). The researcher will then design a Design science approach. This approach will allow adequate triangulation of data from different sources. For this project, we shall be using prototyping methodology for the design and development of the hospital management systems for Zion hospital



## **Study Population.**

According to Zion Hospital records, the population is eight nurses, six doctors, two laboratory technicians and two administrators which gives a total of eighteen members of staff and an average number of 120 patients a month.

1. 4. **Sources of data**The team shall use both primary and secondary data sources. A primary data source of data will take the form of face-to-face interviews while secondary data will mainly be library research and analysis of related documents like review hospital management systems, health care systems, and internet sources. These will be presented in the reference section at the end of the project report.

## **Requirements elicitation techniques**

## **Interviews**

An interview is defined as conversation between the interviewer and the interviewee (Jong & Jung, 2015). However, there are several types of interviews often differentiated by their level of structure (George, 2022). We shall interview a few people of the community so as to get first-hand information about both the existing system(manual system) and ideas about the requirements of our proposed system. The interviews will be held in private so as to increase confidentiality

## **Prototyping**

A prototype is an early sample, model, or release of a product built to test a concept or process or to act as a thing to be replicated or learned from (Volchko, 2017). With this methodology, we shall be able to come up with the model which can predict expiry date, quantity of drugs, tracking of invoices and also further go ahead to develop a hospital management system as a testing tool for the designed model and rapid prototypes will be designed to allow easy changes and handling of users’ needs.

## **Systems analysis and design**

## **Planning and Analysis phase:**

This phase is the fundamental process for understanding the requirements the user needs in the system and will also determine how the project developers will go about building the system thus we intend to collect data, and in this case, we are looking at secondary data gotten from reviewing literature of the already existing manual system, identifying the challenges in them and suggesting possible solutions. This will ensure the achievement of the first specific objective for the proposed project and with this, the hospital management system will be clearly defined.

* + 1. **Design phase:**The design phase is concerned with the laydown of the design on the hospital management system. It involves designing of the databases structure, the system interfaces and how the users will interact with the system.

## **Implementation phase:**

This phase involves the project team gathering all the necessary tools required in coming up with the proposed system. During this phase, the project team will program and coming up with the system. This will be done with the guide of the designs that are developed in the previous phase. The main aim is to have working prototype of the intended system that is interactive to the users.

## **Testing phase:**

During this phase, a hospital management system will be developed and to test validity, we shall track drugs and invoices and see if it can be processed to the end.

## **System design Approach**

System design refers to designing and finally developing the system needed to solve the problem. The research team will adopt the Prototyping Method. The team will use prototyping because it is very effective when it comes to specifying requirements due to how heavily involved the users are. It will allow us to easily know what the user want and to devise means on how best to deliver it to them.

## **Limitations of the project**

Lack of available or reliable data, limited time to finalize our study. There is lack of readily reliable data with variables to be used in this research project. This prompted us to limit the scope of our study.

## **Ethical Consideration:**

Voluntary participation; the participants will be free to opt in or out of the study at any point in time.

Confidentiality; Non-disclosure of the participants’ identifiable information so that it will not be leaked to other data by anyone else

Informed consent; Participants will know the purpose, benefits, risks, and funding behind the study before they can agree or decline to join.

Potential for harm; Physical, social, psychological and all other types of harm will be kept to an absolute minimum.

Results communication; we will ensure your work is free of plagiarism or research misconduct, and you accurately represent your results.

# **APPENDICES**

## Proposed Research Budget.

**EXPECTED BUDGET FOR THE PROJECT**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Description** | **Cost (ugx)** |
| Personal Computer(Laptop) | Storage: 500GB  RAM: 8GB  Operating System: Windows 10/11  CPU: Core i5  Screen size: 14’ | 1,500,000 |
| Transport | Transport to and from the Hospital | 400,000 |
| Internet Modem | 4G/5G Modem | 150,000 |
| Internet Service | MTN internet 100GB | 450,000 |
| Contingency | Unexpected occurrences | 300,000 |
| **TOTAL** |  | **2,800,000** |

## **Appendixes ii: Interview Guide.**

**MAKERERE UNIVERSITY BUSINESS SCHOOL**

**INTERVIEW GUIDE**

Dear Respondent we are students pursuing a Barchelor’s Degree in Business Computing at Makerere University Business School. We are undertaking research which will lead to the development of an online Hospital Management System for Zion Hospital. In order to successfully conduct this research, we need to gather some information from you. You are hereby humbly requested to provide me with the responses to the questions herein. The purpose of this research is purely academic, and all information collected from you will be used for this research only and will remain confidential.

Thank you for your assistance.

a. What is the waiting time for the patients before they see a doctor?

b. How do you handle emergencies and How fast can they be handled?

c. What are the downsides of the management system that you are using currently?

d. How can patients benefit from an online system?

Any other information

Interviewers

Name: ……………………………………………………….. Signature: …………………………………………………..

Name: …………………………………………………………Signature: ………………………………………………….

Interviewee (][Respondent)

Title: ……………………………………………………………………………………………………

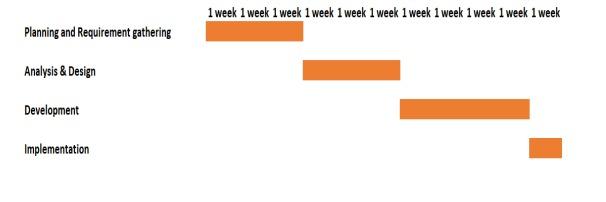
Name: ………………………………………………Signature: ......................................................

Contact: ………………………………………………………………………………………….

**Appendixes iii: Schedule of Activities.**

**2022**

June July August



# **References**

Anderson, T. a. (2012). Retrieved from https://www.tandfonline.com/doi/full/10.1080/03043797.2018.1498459#:~:text=Design%20science%20research%20is%20a,design%20or%20the%20artefact%20itself.

Bogdan, M. (2019, December 12). *How to Develop a Hospital Management System*. Retrieved from https://kindgeek.com: https://kindgeek.com/blog/post/how-to-develop-a-hospital-management-system#text2

Breitmer, R. (2015, july 21). *What are the disadvantages of a manual system.* Retrieved from linkedin.com: https://www.linkedin.com/pulse/what-7-disadvantages-manual-system-richard-breitmeyer

Claybaugh, Z. (2020, october 28). Retrieved from https://en.wikipedia.org/wiki/Research\_design

CPE courses & Books. (2022, March 11). Retrieved from https://www.accountingtools.com/articles/manual-system

govOs. (2021, october 20). *What is records management?* Retrieved from govos.com: https://govos.com/blog/what-is-records-management/

KareXpert. (2021). *Detailed Introduction of Hospital Management System*. Retrieved from https://www.karexpert.com/blogs/what-is-hospital-management-system/

Lee, S.-G., Peng, Z., Zhou, X., Moon, Y.-S., Yoo, J., & Unland, R. (2012). Database Systems of Advanced Applications. *17th internationall Conference,DASFAA 2012.* Busan,South Korea.

Marinič, M. (2015). The Importance of Health Records. *Health*, 617-624.

Ranpura, K. (2021, July 6). *Benefits of implementing a hospital management system*. Retrieved from https://www.anblicks.com/blog/benefits-of-implementing-a-hospital-management-system/

Rupp, S. (2019, November 6). *Importance Of The Hospital Management System*. Retrieved from https://electronichealthreporter.com: https://electronichealthreporter.com/importance-of-the-hospital-management-system/#nav

Sanjana. (2018, October 4). *A detailed view of Hospital Management System (HMS)*. Retrieved from https://mocdoc.in: https://mocdoc.in/blog/a-detailed-view-of-hospital-management-system-hms

Sheremetov, D., & Diachenko, A. (2022, January 26). *How to Create a Hospital Management Software: Key Features, Technologies, and Costs*. Retrieved from https://onix-systems.com: https://onix-systems.com/blog/how-to-create-a-hospital-management-software

Taiye, B. H. (2015). Knowledge And Practice of Documentation Among Nurses in Ahmadu. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 01-06.

Tony abet. (2021, june saturday). *monitor magazine*. Retrieved from monitor: https://www.monitor.co.ug/uganda/magazines/healthy-living/huge-population-choking-kampala-hospitals-3427132

University of Noryhern British columbia. (n.d.). *records management*. Retrieved from www.2.unbc.ca: https://www2.unbc.ca/records-management/why-records-management-important#:~:text=Ultimately%2C%20Records%20Management%20ensures%20that,established%20guidelines%20and%20identified%20legislation.

Zwass, V. (2022, August 24). *information system*. Retrieved from Encyclopedia Britannica. : https://www.britannica.com/topic/information-system