DIGITALIZATION AND ARCHIVAL SYSTEM USING BARCODE SCANNER FOR BAZE UNIVERSITY

Project Submitted in Partial Fulfillment of the Requirement

for the Degree of

B.Sc.

In

Computer Science [Software Engineering]

By

AISHA DAHIRU SHETTIMA

To

The Department of Computer Science

Baze University, Abuja

[Month, Year]

**DECLARATION**

This is to certify that this Thesis entitled DIGITALIZATION AND ARCHIVAL SYSTEM USING BARCODE SCANNER FOR BAZE UNIVERSITY, which is submitted by AISHA DAHIRU SHETTIMA in partial fulfilment of the requirement for the award of degree for B.Sc. in Software Engineering to the Department of Computer Science, Baze University Abuja, Nigeria, comprises of only my original work and due acknowledgement has been made in the text to all other materials used.

Date: [Date Month Year] Name of Student: [Your Name]

**APPROVED BY**  …………………

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Dept. of Computer Science

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This is to certify that this Thesis entitled DIGITALIZATION AND ARCHIVAL SYSTEM USING BARCODE SCANNER FOR BAZE UNIVERSITY, which is submitted by AISHA DAHIRU SHETTIMA in partial fulfilment of the requirement for the award of degree for B.Sc. in Software Engineering to the Department of Computer Science, Baze University Abuja, Nigeria is a record of the candidate’s own work carried out by the candidate under my/our supervision. The matter embodied in this thesis is original and has not been submitted for the award of any other degree.

Date: Supervisor:

**APPROVAL**

This is to certify that the research work, Dental Management System and the subsequent preparation by AISHA DAHIRU SHETTIMA with BU/22B/IT/6789 has been approved by the Department of Computer Science, Faculty of Computing and Applied Science, Baze University, Abuja, Nigeria.

By

|  |  |
| --- | --- |
| [Full name]  Supervisor | Date |
| Dr. C. V Uppin  Head of Department | Date |
| Prof Peter Ogedebe  Dean, Faculty of Computing and Applied Science | Date |
| Prof. Choji Davou nyap External Examiner | Date |

**DEDICATION**

[This is the dedication page.]

**ABSTRACT**

[The abstract provides a clear summary of the project, indicating both content and tone of the project. An abstract includes the method(s) used to analyze the problem, a brief description of the research design, a listing of the key results, a brief description of the significance of the results, selected key conclusions. First-person narrative should not be used in the abstract.]

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**LIST OF ABBREVIATIONS**

CPU Central Processing Unit

ERD Entity Relationship Diagram

IT Information Technology

**CHAPTER 1: INTRODUCTION**

* 1. **Background of the Study**

The Archival System is designed to streamline an organizations documents management processes. It enables the efficient storage, retrieval, and tracking of physical documents and files. The system is designed to improve document management, access control, and audibility. There is often a need for storing information securely online so that the information can be retrieved in the event that one or more source of the documents fails. In some cases, this would allow information to be retrieved in case a catastrophic event. Failures can be result of malicious (e.g., someone breaking into a machine, files been corrupted by virus, worms or malicious codes) or non-malicious (e.g., a machine crashes, fire incident, natural disasters).

The motivation behind digitalization and archival system initiatives at Baze University likely encompasses a combination of operational efficiency, cost-effectiveness, and compliance with regulatory standards, technological advancement, and the enhancement of academic and administrative functions. In light of these factors, the project aim to develop a digitization and archival system that harnesses the potential of barcode scanning technology to address challenges faced by archival institutions. The proposed system aims to revolutionize archival management practices by leveraging barcode scanning technology, digitalization techniques, and user-centered principles.

* 1. **Statement of the Problem**

Despite the growing digitalization trend in archival management, Baze University still struggle with manual processes for organizing, accessing, and preserving their collections. Traditional methods often result in inefficiencies, including time-consuming data-entry, difficulty in locating specific items within the archives. Furthermore, the lack of integration with modern technologies such as barcode scanning hampers the ability to streamline workflows and improve user access.

There is need for the development of a comprehensive digitalization and archival system that leverages barcode scanning technology to address these challenges. This system should be enable efficient digitization of archival materials, seamless integration of barcode scanning for data input and retrieval, and user–friendly interfaces for archival staff and researchers.

* 1. **Aim and Objectives**

The Aim is to develop a comprehensive digitalization and archival system utilizing barcode scanning technology.

The objectives of this project are:

* Streamlining administrative processes to reduce time and effort required for data entry, retrieval and management tasks
* Ensuring the accuracy and integrity of records by minimizing errors associated with manual data entry.
* Implementing measures to protect digital archives from unauthorized access, ensuring the confidentiality and integrity of sensitive information
  1. **Significance of the Project**
* Efficiency: Barcode scanners automate the process of recording and retrieving information, reducing the time and effort required for data entry and retrieval tasks.
* Accuracy: Manual data entry is prone to errors, but barcode scanners ensure accuracy by directly capturing information encoded in barcodes. This helps maintain data integrity and minimizes the risk of mistakes in records.
* Accessibility: Digital archives can be accessed remotely, allowing authorized personnel to retrieve information from anywhere with an internet connection. This accessibility promotes collaborations and facilitates decision-making by providing timely access to relevant data
* Security: Digital archives can be encrypted and protected with access controls, enhancing security and ensuring that sensitive information remains confidential. This is particularly important for academic institutions like Baze University, which handle student and faculty records containing personal and academic data.
  1. **Scope and Limitation of the Study**

The scope of the study on implementing of the digitalization and archival system using barcode scanner at Baze University may encompass:

* Accessing the types of records and document to be digitized and archived, such as student records, administrative documents and research materials
* Examining the hardware and software requirements for implementing barcode scanners and digital archival systems.
* Evaluating the security measures necessary to protect digital archives from unauthorized access and cyber threats.

Limitations of the study may include:

* The study provide valuable insights and recommendations for successfully implementing digitalization and archival system using barcode scanner at Baze University.

**1.6 Project Risks Assessment**

**RISKS**

|  |  |
| --- | --- |
| Inability to carry out research due to loss of  hardware/software resources | Be aware of and observe school IT security procedures  Secure Android mobile phone when not in use. |
| Loss of work due to equipment failure /loss | Weekly data backup to H drive |
| Software availability  (Unavailability of API’s) | Alternative API’s will be checked for. Software requirements will be identified in good time for possible contentious softwares |
| Late delivery of hardware component | Hardware requirements will be identified in good time to be able to order them in good time |

* 1. **Definition of Terms**

Barcode Scanning: Barcode Scanning refers to the process of using technology to capture and convert physical barcodes on documents or items into digital data.

Digitalization: Digitalization refers to the process of converting analog information, processes, or services into digital form.

React: React is a JavaScript library for building user interfaces for web applications.

Backend: Backend refers to the server-side portion of web application or software system.

Authentication: It is a process of verifying the identity of a user or entity attempting to access a system network, or resource.

Archival: refers to the process of collecting, organizing, preserving, and managing records, documents, or materials of historical, cultural, or legal significance for long-term storage and access.

* 1. **Scope/Project Organization**

The work is divided into five (5) chapters. Chapter one introduces this work, its objectives and the methods to follow to achieve those objectives. Chapter two consist of literature review on expert system, it talks about related work. Chapter three describes the main functionality of the system and design of the major components of the system. Chapter four describes the implementation of the system. Chapter five consists of conclusion and provides some essential recommendation.

**CHAPTER 2: LITERATURE REVIEW**

**2.1Introduction**

NOTE: The following case study is used to explain the literature review further. The case study is building houses. This is not part of the thesis but a brief example of how this chapter should be addressed.

This chapter is based on the literature review of the techniques and technology used in this thesis. Section 2.2. is based on the Historical Overview of building houses. Technologically speaking C++/Java/Android/Database (Case study) or whichever technology is used. Section 2.3 gives descriptions of some of the literature available with regards to the application of C++/Java/Android/Database in solving the research question. Finally, section

2.4 is a summary of the entire chapter.

**2.2Historical Overview**

Man’s pursuit for shelter has been engraved in his DNA since the beginning of time. This comes next to his need for sustenance. As such, man has built shelter in different shapes and forms since the beginning of time. Man evolved from building thatched houses to building much more modern sophisticated houses. The drive for excellence and much more comfort has led to different designs of houses. This does not exclude thatched houses. Different shapes and sizes of these can also be found. Therefore, it is no surprise why different aspects of education such as civil Engineering, Architecture and more recent, interior designs have arisen to help satisfy the different tastes and solve different constraints associated to building houses.

The work presented in this project is based on building houses using concrete.

If the project is based on the use of a certain technology e.g C++. One can start similar to this: (C++ is an Objected oriented programming language developed by Bjarne Stroustrup at AT&T Bell Laboratories in Murray Hill, New Jersey, USA [reference].)

**2.3 Related Work**

Concrete has over time proven to be a very important component in building houses [reference agreeing with this assertion]. In the work of [reference A], it adopted the use of concrete to build houses. The concrete was mixed with a 20% percent sand and 10% water. This gave the concrete a good molecular bonding structure which in turn has shown that the walls are stronger. However, the sand used in this work lacks the required texture for a much stronger bond. To solve the problem of stronger bonding associated to [reference A], [reference B] adopted a different type of mix, this work adopted mud as opposed to normal sand. The adoption of mud shows a 10% increase in the strength of the concrete mixture. The availability of mud around this geographical location limits the adoption of mud as an additive for concrete mixture.

**2.4 Summary**

The literature reviewed in this chapter shows that the use of 20% sand as a mixture for concrete does not have the requisite strength to be used for buildings in this geographical location and the use of mud is also not an option due to its availability within this area.

Therefore, it is important to explore different resources that are both readily available and offer a better mixture and improvement in the strength of the concrete for building the houses.

Chapter 3 presents the requirement analysis and the methodology adopted in solving the problem of concrete mix strengthening.

**CHAPTER 3: REQUIREMENTS, ANALYSIS, AND DESIGN**

**3.1 Overview**

[You are required to introduce the chapter.]

**3.2 Proposed Model**

**3.3 Methodology**

**3.3.1 Method 1 (e.g Interview)**

**3.3.2 Method 2 (e.g Observation)**

**3.4 Tools and Techniques**

**3.5 Ethical Consideration**

**3.6 Requirement Analysis**

**3.7 Requirements Specifications**

**3.7.1 Functional Requirement Specifications**

# Table 1 Functional Requirement Specifications

|  |  |  |
| --- | --- | --- |
| **Req.**  **No.** | **Description** | **Type** |
| R-101 | The server shall Windows 7 or later version. | Configuration |
| R-102 | The application shall include a user interface. | Functional |
| R-103 |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**3.7.2 Non-Functional Requirement Specifications**

# Table 2 Non-Functional Requirement Specifications

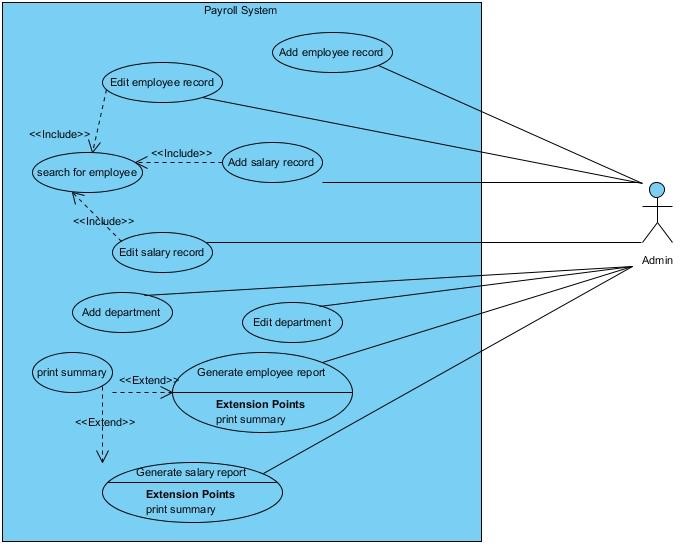
|  |  |  |
| --- | --- | --- |
| **Req.**  **No.** | **Description** | **Type** |
| R-101 | When launched, the application shall stay running unless there is an intentional shutdown of the application or the platform. | Performance |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**3.8 System Design**

[You are required to give a good introduction and brief explanation outlining the major components of the system.]

**3.8.1 Application Architecture**

**3.8.2 Use Case**



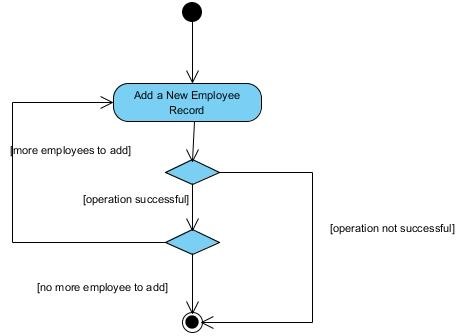
# Figure 1 Use Case diagram

*[A Use Case diagram depicts the interaction between the users and the system. It shows the functions of the system from the user’s point of view and the various actions the user as the actor carries out.]*

**3.8.3 Data Design**

**3.8.4 Activity Diagrams**

An activity diagram is a model that shows the process of a task or action from a use case.



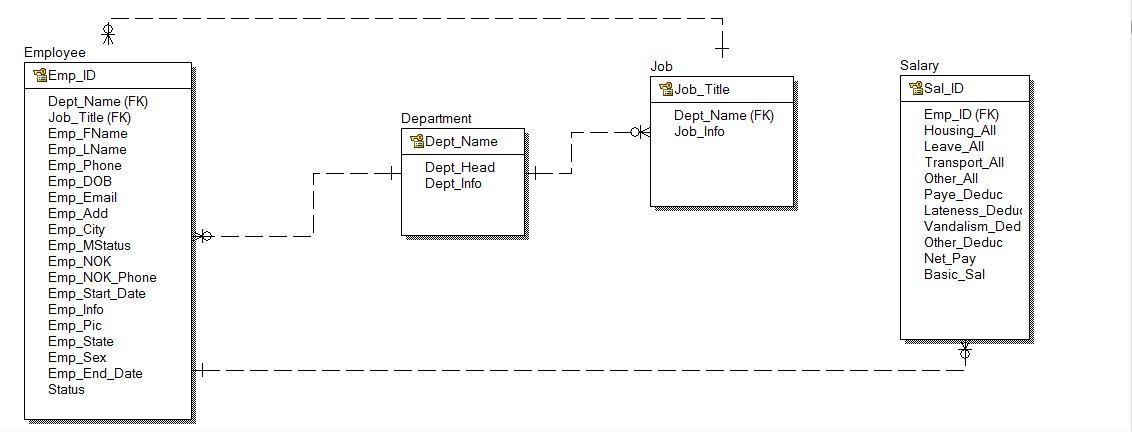
# Figure 2 Activity Diagram

**3.8.5 Dataflow Diagram**

**3.8.6 Control Flow Diagram**

**3.8.7 Entity-Relationship Diagram (ERD)**

[Entity-relationship diagrams show the entities and attributes of tables in a database. Linked ERDs show the relationship between tables or tables. Entities can only have a many-to-one or one-to-many relationship, e.g., in Figure A below.]



**Entity Relationship Diagram**

**3.8.8 User Interface Design**

**3.9 Summary**

**CHAPTER 4: IMPLEMENTATION AND TESTING**

**4.1 Overview**

[You are required to introduce the chapter.

The following materials listed below are the hardware and software components used for the implementation of the database system for which this report has been written.]

**4.2 Main Features**

**4.3 Implementation Problems**

**4.4 Overcoming Implementation Problems**

**4.5 Testing**

**4.5.1 Tests Plans (for Unit Testing, Integration Testing, and System Testing)**

**Figure xx Test Plan Tree**

**4.5.2 Test Suite (for Unit Testing, Integration Testing, and System Testing)**

**Table xx Test Suite Performed**

|  |  |  |
| --- | --- | --- |
| **Req.**  **No.** | **Description** | **Type** |
| R-101 | When launched, the application shall stay running unless there is an intentional shutdown of the application or the platform. | Performance |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**4.5.3 Test Traceability Matrix (for Unit Testing, Integration Testing, and**

**System Testing)**

**4.5.4 Test Report Summary (for Unit Testing, Integration Testing, and System Testing)**

**4.5.5 Error Reports and Corrections**

**4.6 Use Guide**

**4.7 Summary**

**CHAPTER 5: DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

**5.1 Overview**

**5.2 Objective Assessment**

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**5.3 Limitations and Challenges**

**5.4 Future Enhancements**

**5.5 Recommendations**

**5.6 Summary**

**REFERENCES**

*[APA Style or Harvard Referencing.]*

**APPENDICES**

**Appendix A - Project Document**

**Appendix B - Questionnaire**

or Proceedings of Interview or Observation Reports etc

**Appendix C – Source Codes**

**Appendix D – Test Cases**

**Appendix E – User Guide/Manual**

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