CENTRAL MINDANAO UNIVERSITY DIGITAL ARCHIVE SYSTEM
(CMU - DAS)

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Table of Contents

Title page i
Approval Sheet ii
Table of Contents iii
List of Figures iv
List of Tables v
CHAPTER 1 INTRODUCTION 1
1.1 Background of the Study 1
1.2 Statement of the Problem 2
1.3 Objective of the Study 3
1.4 Scope and Limitations of the Study 3
1.5 Significance of the Study 3
CHAPTER 2 TECHNICAL BACKGROUND 5
CHAPTER 3 REVIEW OF RELATED LITERATURE 8
3.1 Review of Related Concept 8
3.2 Review of Related System 8
CHAPTER 4 METHODOLOGY 10
4.1 Conceptual Framework 10
4.2 Research Approach 10
4.3 System Development Methodology 11
4.4 System Analysis 13
4.5 System Requirements Specification 20
4.5.1 Functional Requirements 20
4.5.2 Non-functional Requirements 21
4.5.3 Other project Requirements 21
4.6 Project Management 22
4.7 Testing Methodology 24
REFERENCES 27
APPENDICES 29

List of Figures

Figure 1: Conceptual Diagram of the System 10
Figure 2: Agile Methodology Model 11
Figure 3: Flowchart of the proposed system 13
Figure 4: Activity Diagram 15
Figure 5: Data Flow Diagram: Context Diagram 16
Figure 6: Entity Relationship Diagram (ERD) 17
Figure 7: Data Dictionary 17
Figure 8: Gantt Chart 22
Figure 9: Use Case Diagram 30

List of Tables

Table 1: Data Dictionary for tbl_client 17
Table 2: Data Dictionary for tbl_staff 18
Table 3: Data Dictionary for tbl_request 18
Table 4: Data Dictionary for tbl_file 19
Table 5: Data Dictionary for tbl_retention 20
Table 6: Input Requirements 21
Table 7: Output Requirements 22
Table 8: Use Case Suite 29
Table 9: Use Cases 31

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

According to Wang (2014), the development of information technology, the preservation of archival materials and special collections has moved from analogue to digital, and that digitization has become a global trend. The advancement of technology has given birth to records that exist in digital forms. With the fast rate of technological advancement, more and more records are produced in digital form. Also, digital form records' characteristics that quickly access further promote the transition from typical 'physical' documents to digital forms. According to Sternfield (2011), digital archiving is a new theory and methodology that draws from both disciplines and creates a shared vocabulary for the production, use, and evaluation of digital historical representations, a broad term that encompasses an array of products such as archives, databases, geospatial visualizations, and mobile applications.

Information systems have shown their significant impact and importance in the digital age. A study reveals the benefits of having a digitized process were fast and increased productivity, better monitoring, high level of accuracy, and high level of consistency of information (Kia, Shayan, & Ghotb, 2000). Many organizations are developing information systems explicitly designed to facilitate the sharing and integration of knowledge (Alavi & Leidner, 1999). Despite the application of technologies, there are still using the manual process of data storage and retrieval, which hinders the productivity, efficiency, and accuracy of the information and the quality service itself (Keating, 2016). Electronic records have been used widely in many organizations, and the problem arises when it comes to the preservation of electronic records for long-term access. The preservation of records involves ensuring that the record contains the same information it did when archived and ensuring that the record can be viewed using existing technology. It also involves maintaining security and intellectual property rights (Rodriguez, 2005)

Identified problems in traditional data storage methods, such as it takes too long to acquire, cost too much maintenance. It is not scalable enough, and it requires too much commitment. Also, the Deputized Document Controller of the Records Management Unit mentioned that some of the damages of the documents are by

termites. The manual process of data storage and traditional data storage methods still exists in the university.

Ever since the CMU started its services, the documents are manually stored in a physical space, a stack of boxes, filing cabinets full of documents or copies. The main drawback of this method is that it is cumbersome and slow to use. Finding information with paper documents can take hours, even days, in some cases. The University archive itself needs to an upgraded to provide better service, preservation, and accessibility. This proposal would be beneficial to the Records Management Unit (RMU). The researcher proposed an alternative technology to provide a digital archive, long-term preservation, and digital collections access.

The researcher comes up with a possible solution for this problem. Digital Archiving, switching from paper to digital document management and archiving, can help the Records Management Unit reduce physical storage space and ease day-to-day operations. Computer hardware can pull up digital documents, search their contents, and sort and catalogue information in seconds. The proposed system is the "Central Mindanao University Digital Archive System." The RMU had digital copies of all documents through the proposed system, and those digital files can be store on hard drives, local servers, and the cloud. Enables the RMU to organize essential files and provides an easy way for the files to locate and retrieved when needed.

1.2 Statement of the Problem

The academic archive's fundamental goal is to aid the institution in its survival and growth by supporting its educational mission (Guidelines for College and University Archives, 1999). As part of providing a quality service and education, the archive serves administrative units access to the permanent records - documents and materials essential to the institution's function. In addition, student's access to archival materials that support curriculum and introduction of research enhances their educational experience and faculty's use for research in the collection that provides unique materials.

The CMU Records Management Unit lacks any platform or system and instead uses the traditional archiving and delivery method. Administrative units, students, and faculties had difficulty getting access to those archived collections or documents they

needed because the service offered is still manual. Hence, the preservation and access to archived materials are not efficient at all.

To provide a new practical and efficient preservation of documents and access to CMU materials, the developer has intended to create a new information system to be used solely by the Records Management Unit, administrative units, faculty, and students.

1.3 Objective of the Study

This study aims to develop a Digital Archive System for the electronic files of Central Mindanao University. Specifically, this study aimed to:

1. Design a system that provides storage, preservation and management of the electronic files.
2. Create a security measure that can maintain the safety of the institutional documents and avoid any physical damage.
3. Create a system that can help to ease locating, retrieval and access of archived files.
4. Design a system that can generate monthly and yearly reports of the transactions within the system.

1.4 Scope and Limitations of the Study

This study aims to develop a web-based application entitled CMU - Digital Archive System to store all university records. It also provides backup in case of loss of records or any physical damage. It will simply identify the task of RMU Staff in terms of storing, preservation, searching, and retrieval of documents. The proposed system is intended for the Central Mindanao University Records Management Unit located in University Town, Musuan, Maramag, Bukidnon. The developer limits the usage of this archive system only for the accessibility of the staff of the Records Management System. Usage of this project outside the university or the stated location above is prohibited.

1.5 Significance of the Study

This study would be beneficial to Central Mindanao University. Potential improvement of the Records Management Unit should only bring good outcomes,

creating the institution that can reach and serve a more broadly based research community. This study would also benefit the students and faculties of Central Mindanao University. They will no longer have a hard time accessing archived materials supporting their learning and providing unique materials for quality education.

The importance of this study is that it brings the Records Management Unit closer to the students, faculties, and administrative bodies, opening the doors to the institutions' better service and understanding the importance of preservation and internalizing the beauty of the university in an accessible and effective way.

In addition to the information stated above, this study is beneficial to the Information Technology students. By this study, the IT students of Central Mindanao University will practice different skills related to their field and improve their good standard capabilities.

CHAPTER 2

TECHNICAL BACKGROUND

The CMU Digital Archive System is a project that encompasses different disciplines in the field of information technology. It provides record management, storage, preservation, access, and disposal of digital records. The following terms enumerate the technologies to be used to make the system.

The proposed system is intended to use MVC (Model-View-Controller) architecture. MVC encapsulates the data and its processing and isolates it from handling and presentation to represent the program. MVC follows the foremost common approach of Layering. Layering is nothing but a logical split of code into functions in several classes. The best thing about this approach is that code reusability is easier to take care of and develop and upgrade with new features. In developing CMU DAS, each layer within the MVC architecture has been implemented differently, like MySQL database, which serves as a model, HTML, CSS, JavaScript used for the program interface, and PHP web service a controller.

PHP is a powerful language to develop dynamic and interactive web applications. One of the defining features of PHP is that the ease for developers to attach and manipulate a database. PHP prepares the functions for database manipulation. However, database management is done by the Structure Query Language (SQL). The model means the application's business logic and is the core of the application. The typical classes within the model are: connect DB, insert, update, delete, select, and many more. These classes are to be used for manipulating the database, and here, the MySQL database is a model. The view is that the controller's user interface and also the user interface's public face. Multiple views are designed and developed with HTML, cascading style sheets (CSS), and JavaScript within the publication database. The controller component implements the flow of control between the view and, therefore, the model. It contains code to handle the user actions and invoke changes within the model.

The developer uses various technologies from both web-based frameworks and server-side frameworks. They will be discussed in the following paragraphs.

Web Application Framework

A web application framework is a framework designed to support web applications, including web services, web resources, and web APIs. Nowadays, the use of software framework is the most popular in web application development due to the advancement of technology in web application programming and its standardization in building and deploying web applications on the World Wide Web.

Hypertext Preprocessor (PHP)

Hypertext Pre-processor is a widely-used, open-source scripting language that runs on multiple platforms, also making it platform-independent and compatible with almost all web servers in use today. It also supports and can manipulate data on a wide range of databases, run efficiently on the server-side, and restrict users from accessing some pages on a website. The Implementation of the backend of the system was done using PHP.

Laravel Framework

It is an open-source PHP web framework developed by Taylor Otwell in 2011 that pursues the Model-View-Controller (MVC) architecture pattern. This framework is robust and straightforward, making it easy to be understood by beginners. In addition, Laravel provides authentication, routing, caching, and great database migration tools that enable developers to build complex applications (Chen et al., 2017).

Hypertext Markup Language (HTML)

HTML is the standard markup language used to build electronic documents displayed in a web browser. It is the main structure of a web application. It has several support technologies that enhance content created from HTML like CSS and JavaScript. HTML files have a .html or .htm file extensions.

Cascading Style Sheet (CSS)

CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML-based markup language. (W3C, 2016)

JavaScript

JavaScript is a scripting language that enables you to create dynamically updating content, control multimedia, animate images, and pretty much everything else. (MDN Web Docs, 2021)

MySQL

It is a database management tool that was used to implement the database of this system. MySQL is a popular open-source database management system commonly used in web applications due to its speed, flexibility, and reliability. MySQL employs SQL, or Structured Query Language, for accessing and processing data contained in databases. (Giunipero, 2009)

XAMPP Server

It is an open-source, cross-platform web server package that makes it easy to test and deploy a web server on any operating system. Due to PHP being a server-side scripting language and cannot be tested locally unless the Apache web server is running locally, a virtual server was required. Hence, XAMPP was used to provide a virtual web server that has Apache and MySQL capabilities.

CHAPTER 3

REVIEW OF RELATED LITERATURE

3.1 Review of Related Concept

Featherstone (2006) argues that the archive is the place for storing documents and records. With the emergence of the modern state, it becomes the storehouse for the material from which national memories were constructed. In addition, the book *"Theories of the Archive from Across the Disciplines"* written by Manoff (2004), claimed that Derrida and Foucault and many other humanists and social scientists had initiated a broadly interdisciplinary conversation about the nature of the archive. This literature suggests a confluence of interests among scholars, archivists, and librarians fueled by a shared preoccupation with the function and fate of the historical and scholarly record. The need to have this project has already been seen from different theories and concepts. Archive systems are used in institutions like universities and other establishments that hold unique, meaningful, and confidential documents. According to the *"Archive Fever: A Freudian Impression"* written by Derrida, (1996), The archival concept has of late played a pivotal role in critical debate. A place of origin, yet perpetuity, a place of stasis and order, yet of discovery, the notion of archive houses a fascinating complex of diverse, and often disparate, meanings. As a depository of civic record and social history whose very name derives from the Greek word for the town hall, the archive would seem to be a public entity. Yet, it is stocked with the personal, even intimate, artifacts of private lives. An electronic document has a complex life cycle starting with document creation, including sophisticated document creation, usage, storage, and destruction if a document has a limited life cycle. (Ragaisis, Birstunas, Mitasiunas, & Stockus)

3.2 Review of Related System

In the study of Mkpojiogu, (2020) in their published study, the *Implementation of a Web-based Data Archival Management system* The proposed system not only allows the user to review all the files in different modalities but also allows the user to do online processing and/or annotation directly on to (Gamba, Ocbain, & Gamba, 2014)p of the files. The user could save the processed files and/or the original files along with the newly written annotation into his/her local folders or contribute them to the whole community by uploading the files back to the system so that this information

will be archived in the system. The system is a full spectrum of online communications, processing, and annotation tools and provides powerful multimodal search functionalities to the users. In addition, the database is always kept in "live" mode such that information contributed by users is periodically indexed. The architecture of the system consists of the standard 3-tier, browser-server model. The systems may be run with any standard web browser, on any hardware, and with any operating system provided, there is an internet connection. The system uses the Oracle 9i database. The functionalities of this system include online data processing, macro language, online annotation, powerful querying capabilities, and membership control.

In addition, *The Utilization of an Electronic Archival System to Support Archiving Services Offered by the University of Indonesia,* the Indonesian Archives Office has initiated technology to provide more effective and efficient services to users. Such use of technology was implemented at the University of Indonesia's Archives Office by creating an electronic archive system (SEKAR). SEKAR was developed to assist archivists in managing their document repositories and making it easier for end-users to process loans and retrieve archived documents. SEKAR encompasses discrete functions that support improved archive management. Effective archive management generates ameliorated services.

Gamba, (2014). *System development of records archiving and digital Document Repository: A case study*. The study presented its purpose of preserving valuable documents in a different field by means of their repository and allowing them to be accessed by stakeholders to their public servers anytime and anywhere. All data stored in the repository can be accessed only by those employees who have the proper credentials and prevent anonymous access to the documents stored. The repository servers can only be accessed through the software gateway to validate its legitimate connection; thus, preventing vulnerabilities in its security protocol. The rate of transfer of documents from server to clients depends on file size and format. Moreover, most of the deployed archiving software presented in the studies were server-client in nature which is another form of security for their deployment.

CHAPTER 4

METHODOLOGY

4.1 Conceptual Framework

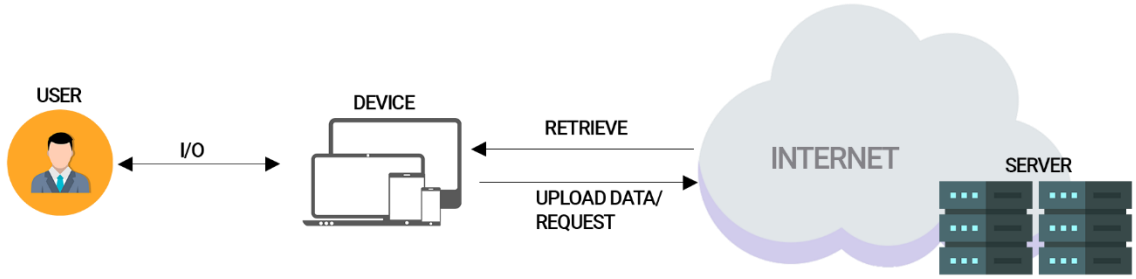

Figure 1: Conceptual Diagram of the System

The CMU Digital Archive System is expected to systematize the activities involving records management, archiving, disposal, and access. The system user is identified into two; the Records Management Unit and the institutional constituents; these are students, alumni, and employees who can request the RMU. The Records Management Unit handles the system function, such as records management, preservation, access, disposal of the institutional documents, and other services. The institutional constituents can only access limited archived documents with the approval of RMU personnel. Figure 1 shows the Conceptual Diagram of the System. The user access was implemented using the web-based application, which is connected to the internet. The System stores all types of digitized documents managed and maintained by the RMU.

The management of electronic documents of CMU Digital Archive System's primary goal is to archive, preserve, retrieve effectively, and quick accessibility to documents when needed and improves the RMU service to the institutional constituents. The system software has security features that only authorized personnel can use the system. The system is user-friendly and supports different manipulations.

4.2 Research Approach

The researcher used the interview approach through social media platform (messenger), which questions the current problems and archiving process, disposal of records, and records requests. The Deputized Document Controller, Mr Jhon Wayne D. Justol, discussed and provided documents on how the records are being handled from acquisition, archiving disposal, and access to the requested archives.

The RMU has three processes involved according to the documents acquired by the researcher, namely Filing and Transmission of Files, Disposal of records, and Request of Records. Mr Justol suggests that the proposed system features essential functions such as view, add, search and delete. He also identified that some documents stored physically are damage due to termites. Also, the researcher understands the business logic process from acquisition and disposal to requests of records. Enables the developer to provide information to address and develop an effective solution for the proposed system.

4.3 System Development Methodology

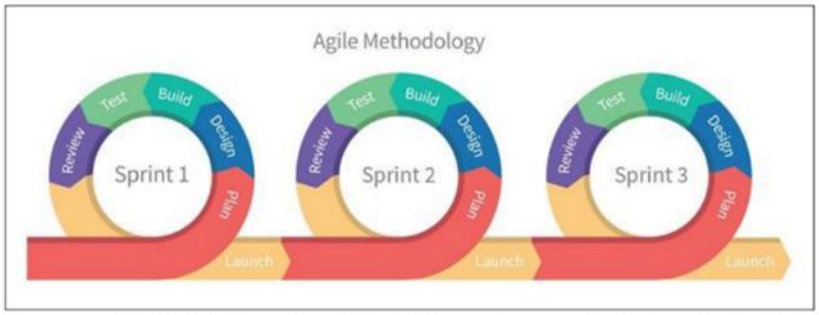

Figure 2: Agile Methodology Model

The developer uses the Agile model approach in the Software Development Life Cycle (SDLC); it combines both iterative and incremental process models. It focuses on process adaptability and customer satisfaction by rapid delivery of working software. The agile model approach breaks down the product into small incremental builds.

The agile model has its iterative feature, which enables the development workflow flexible and efficient. Each of these iterations produces a different result which will be addressed in the next iteration. Also, the result is produced by the user's feedback from the first deployment of the system, and these identify the system deficiency, problems, and errors encountered in the system. In this methodology, there are five (5) phases included these are the following:

Planning

In this phase, the developer planned on the different actions assumed during the entire software development cycle. The developer's plan actions include determining the parties involved in the development of the system, which data to

gather, whom the persons from each party to approach, and documenting data gathered from these interviews.

Also, the development scope, who is the user and who will manage the system, is determined in this phase. It also identifies software and hardware tools in developing the system, technologies to be utilized for the project, and probable testing methods to be used in the testing stage. With each progression, the developer acknowledged the system's elements or parts that require improvement or removal due to either being impossible or redundant for it to co-exist with the suggested system. These elements or parts could vary from procedures executed, user interfaces, program logic implemented, created, and edited by the user.

Design

The developer creates initial designs for the first run in this phase. These initial designs include the flowcharts, entity-relationship diagrams, database design that show the logic aspects of the system, steps, and processes to code when creating the system.

In the later runs of this cycle, the developer has to refine the design based on results collected on the first run; this could be in the logical structure of the system or the presentation of the system. The system needs to be refined to work it smoothly. For future development, code structure has an important role. It should be understandable and organized, making it easier for future developers to understand the code and improve the system or its user interface and increase memory usage efficiency and performance.

Building

The design created in the previous phase will be implemented in the building phase. The developer can now create an information system using programming and scripting languages to adapt the processes. Meanwhile, software tools and other additional devices create the wireframes and database design into their equivalent output and structure. Indeed, the developer doing a developer-level system testing is the manual testing at this phase; some of the outputs may have minor changes, but the building and content had stayed the same.

Testing & Review

In the testing stage, various testing methods will be utilized to measure the quality of the created web application. And the developer will conduct usability testing, specifically using alpha testing. Through the testing, the developer can acquire

feedback from the user's perspective towards the system, and this feedback can help the developer improve and identify the problems in the system.

Deployment

Once the testing phase is over, and no bugs or errors are detected in the system, the final deployment process starts. Based on the feedback given by the RMU, the final software is released and checked for deployment issues, if any. Next, the developer conducts user training so that the RMU management will have the proper orientation on using the system; means the acceptance testing explicitly.

4.4 System Analysis

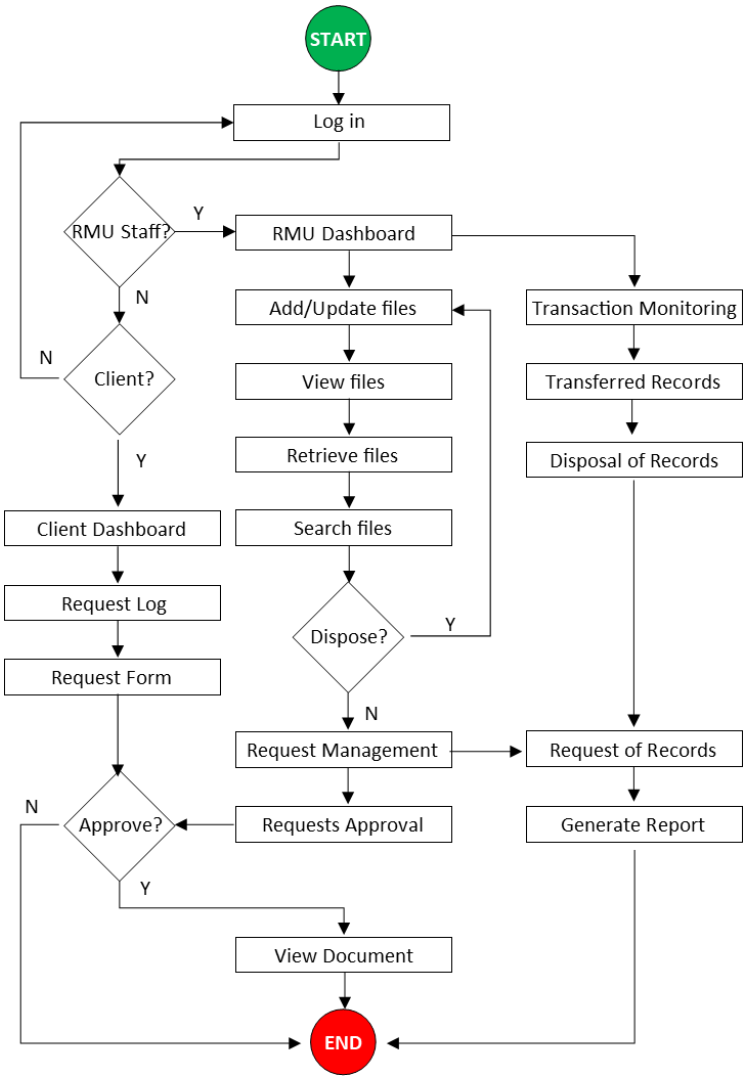

Figure 3: Flowchart of the proposed system

This figure shows the flowchart of the proposed system. The first thing the user needs to do is log in to the system to be authenticated by the system. The RMU personnel has already given their user and password of the system, and it's exclusive

only for the use of the Records Management Unit; otherwise, log in as a client if no account the client can register to the system. The client has limited access only to the system; the client can only monitor his/her request logs, request archived documents, view the approved archived document in a limited time. Upon requesting a document, the user will fill up the request form, which requires a communication letter approved by the adviser if the client is a student. The alumni/employee/other sectors shall prepare a letter of intent address to the RMU Chief; when filling up the request form, the RMU staff will review the request. Then the RMU staff sends feedback to the client, if approved or not; if approved, the feedback will contain the access link of the requested file. The file can be view only by the client, and any modification or downloading of the document is strictly prohibited. Otherwise, if the requested form is not approved, the client will be notified or request another document.

On the other hand, the RMU staff, Deputized Document Controller, and the RMU chief have full access to the system. The Records Management Unit can manage the system, adding documents, view, update, search, and disposal of the documents. Also, monthly and yearly reports are generated automatically in the system when needed the generated reports are available for printing. In the office's service area, the staff will manage the requests, review requests, and approve the requests. In this way, it will help the RMU service section can serve more effectively and efficiently.

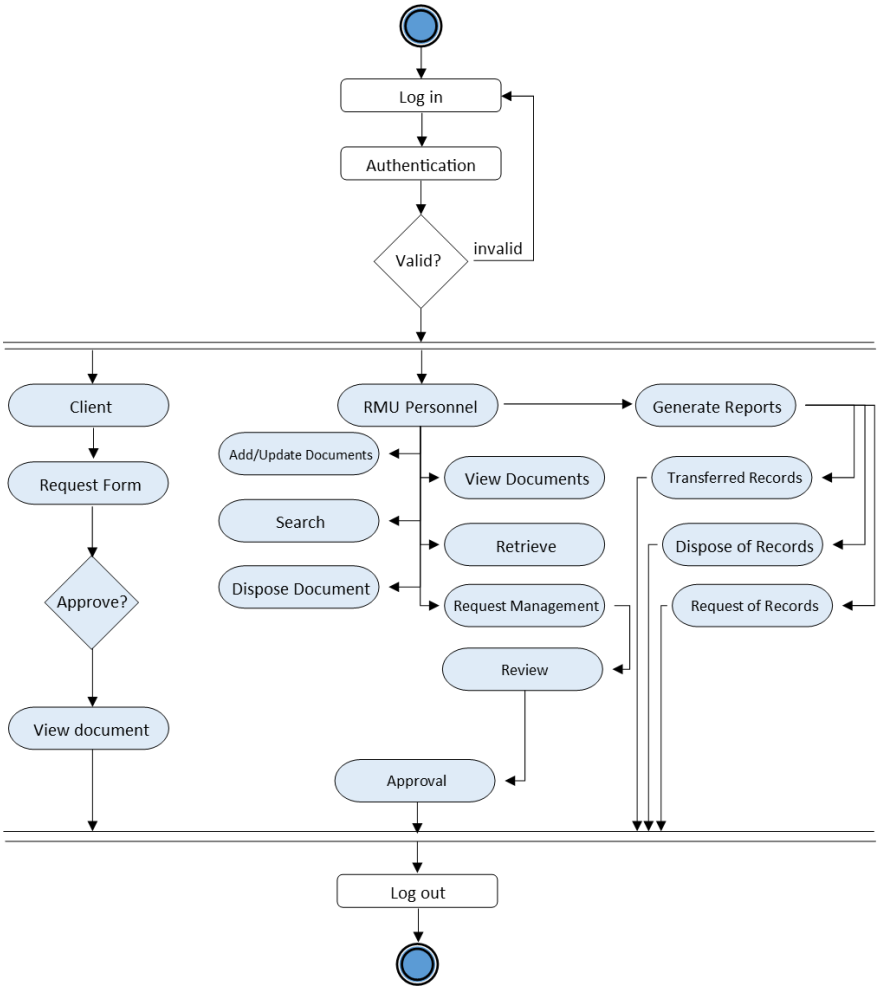

Figure 4: Activity Diagram

This diagram starts with the user's (client, RMU personnel) login information, and then the system will authenticate and validate if the user was the owner. When it is validated, the system will directly display the information based on the user's role. There are two activities shows in the system in which are classified into two primary roles. First, RMU personnel activity, if the RMU staff has already created an electronic record of the physical documents, will be added now into the archive system through Add documents. Second, the personnel can also view the record in reviewing the stored documents. RMU personnel can also update the documents inside the system in case there are some changes made by the author of the document or the office where it came from. Note that RMU personnel are not authorized to modify the content inside the documents.

The personnel also can retrieve the documents when needed or requested. Searching of documents is necessary for the RMU personnel to fast locating the desired document, retrieval, disposal, and monitoring of a specific record. When the

document's retention period is reached, RMU personnel will dispose of related records according to the RMU protocol. Under the activity of RMU personnel is the management of the request, where all requests coming from the client are being handled, reviewed, and identified what the requested documents are, availability of the requested document, and submission of required credentials from authorized persons are. Lastly, the approval of the requested document will be forwarded to the client. The activities they can do in the client activity are limited; the client can only perform requests and view the document. In submitting the request form, the client must fill and submit the needed credentials and details. After the form is submitted, the client will wait for the RMU personnel's response either if it is approved. If approved, the RMU personnel will provide access to the requested document but only in view and limited time; when the limited time reached, it will be automatically disabling access to the document. The Records Management Unit is obliged to submit monthly and yearly report, the system features generate report, which all transactions with in the system such as transferred records, dispose of records and request of records are generated and ready for printing.

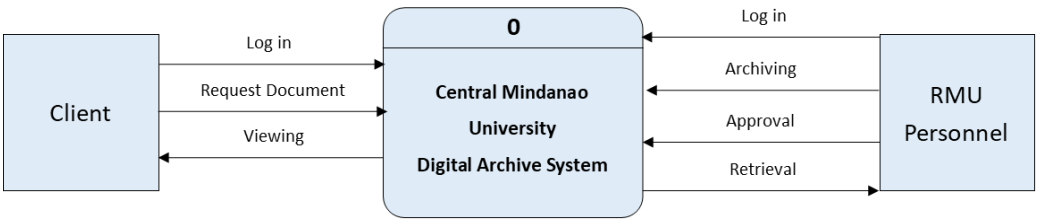

Figure 5: Data Flow Diagram: Context Diagram

Data Flow Diagram Level 0 the function of the application to the client and the RMU personnel. The client can access the information stored in the archive database by requesting the RMU personnel to access the requested document and depend on the document available for public access. At the same time, the RMU personnel will review the client's requested document, approve the request, and give access to the document. Thus, the RMU can archive electronic documents inside the system; RMU personnel has full access to the system, manages the archived documents, and manages requested documents.

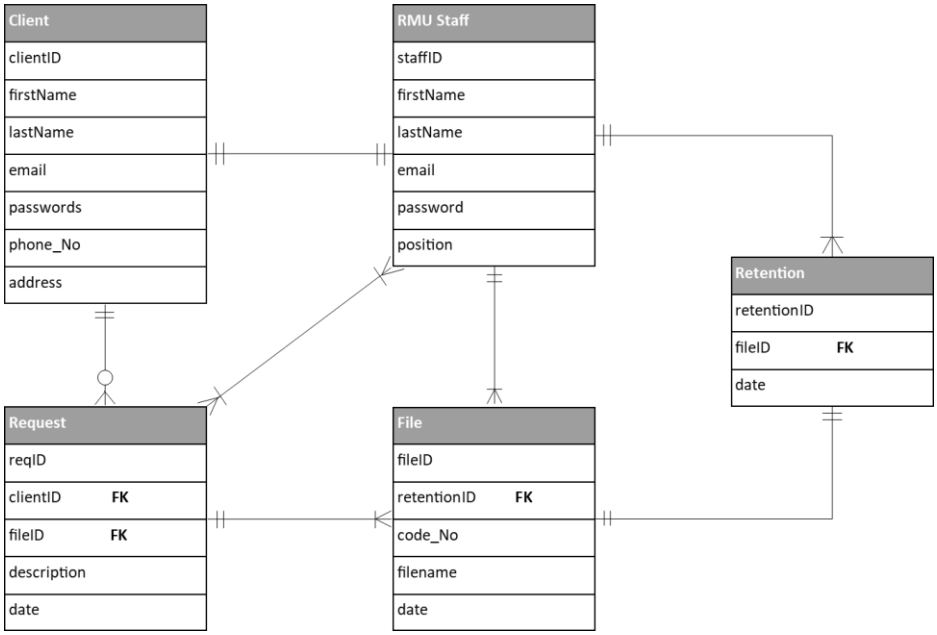

Figure 6: Entity Relationship Diagram (ERD)

The figure above shows the relationship between entities. An RMU personnel/staff has a client with their personal information, password, and id; these are the requirements to log in to the system and to be able to make requests. The client can request a form; the form contains a required field for the RMU staff to validate the request. The RMU staff can manage both requests, documents, and disposal referring in the retention period set in the system. The client doesn't have a relationship with the archive files, and it requires going through the request.

Figure 7: Data Dictionary

Table 1: Data Dictionary for tbl_client

tbl_client				
Field Name	**Type**	**Constraints**	**Description**	**Reference Table**
client_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	N/A
firstName	VARCHAR(50)	NOT NULL	Firstname of the client	N/A
lastName	VARCHAR(50)	NOT NULL	Lastname of the client	N/A

email	VARCHAR(50)	NOT NULL	Email of the Client	N/A
password	VARCHAR(50)	NOT NULL	The password of the client	
address	VARCHAR(50)	NOT NULL	The address of the client	N/A
contact_num	INT(50)	NOT NULL	The client's contact number	N/A

Table 2: Data Dictionary for tbl_staff

tbl_staff				
Field Name	**Type**	**Constraints**	**Description**	**Reference Table**
staff_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	N/A
firstName	VARCHAR(50)	NOT NULL	First name of the staff	N/A
lastName	VARCHAR(50)	NOT NULL	Last name of the staff	N/A
email	VARCHAR(50)	NOT NULL	Email of the staff	N/A
password	VARCHAR(50)	NOT NULL	The password of the staff	
position	VARCHAR(50)	NOT NULL	The position in the RMU.	N/A

Table 3: Data Dictionary for tbl_request

tbl_request				
Field Name	**Type**	**Constraints**	**Description**	**Reference Table**

request_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	N/A
client_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	tbl_client
file_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	tbl_file
req_desc	VARCHAR(100)	NOT NULL	description of the requested file	N/A
Date	INT(50)	NOT NULL	The request date history	N/A

Table 4: Data Dictionary for tbl_file

tbl_file				
Field Name	**Type**	**Constraints**	**Description**	**Reference Table**
file_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	N/A
retention_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	tbl_retention
code_number	INT(50)	NOT NULL	Specified code number of the file	N/A
filename	VARCHAR(50)	NOT NULL	the filename of the archive document	N/A
Date	INT(50)	NOT NULL	The archive date history	N/A

Table 5: Data Dictionary for tbl_retention

tbl_retention				
Field Name	**Type**	**Constraints**	**Description**	**Reference Table**
retention_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	N/A
file_ID	INT(50)	Primary key, not null, unsigned	Unique identifier for this table row	tbl_file
Date	INT(50)	NOT NULL	Date of the scheduled retention	N/A

4.5 System Requirements Specification

4.5.1 Functional Requirements

The system's functional requirement is to make an archive system that primarily supports the Records Management Unit managing and storing the electronic records and secondarily works the client requests to access the archived documents.

These requirements describe the function attended by the system in the Records Management Unit, which are:

1. Each user of the system must register to the system, RMU personnel, or client.
2. The RMU personnel shall be able to input the electronic document into the system.
3. The system shall display all inputted documents in the interface and all the client's requests.
4. The RMU personnel shall be able to per search and retrieve the document.
5. The system shall be able to dispose of the electronic document when necessary.

6. The system shall be able to generate reports accurately based on the activities done within the system.
7. The clients shall be able to send requests and view the requested document when approved.

4.5.2 Non-functional Requirements

The following are the non-functional requirements of the system:

1. Easy-to-use. The system is easy to use, where the RMU personnel can easily navigate through the application, and the user interface is very straightforward and easy to understand. The client as well can easily understand the interface.
2. Efficiency. The system offers fast service in the Record Management Unit and the services the office provides to its client. It enables the office to operate more reliable, quickly in locating and retrieving the requested documents.
3. Security. Each user uses the system is classified and separated, in this case, the RMU and client. Aside from primary authentication, an email and a password. The RMU has complete control of the system, and the office verifies users before logging into the system. All clients who access the system are routed to a different page to only perform limited access inside the system. In their case, the client only can complete a request for documents.

4.5.3 Other project Requirements

4.5.3.1 Hardware Requirements

For the Records Management Unit, a Core i5 CPU with 2GHz or better computer is required. In addition, the RAM must be at least 4GB to handle the web application. For the client, as long as the client device can run a browser.

4.5.3.2 Software Requirements

In this specification, the system web browser is either Firefox or Chrome browsers.

4.5.3.3 Input Requirements

Table 6: Input Requirements

Input Requirements
User Log in credentials

tbl_file
tbl_retention
tbl_request

4.5.3.4 Output Requirements

Table 7: Output Requirements

Output Requirements
tbl_retention
tbl_request
Generated report

4.6 Project Management

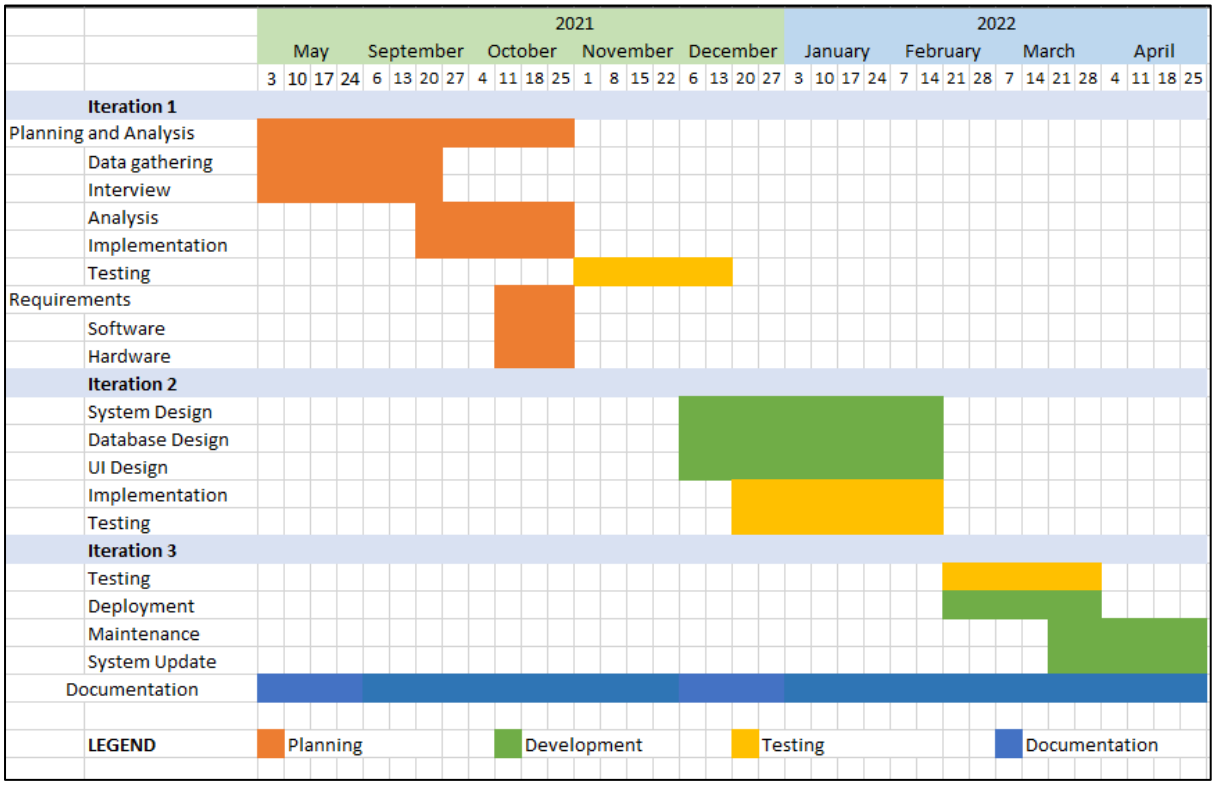

Figure 8: Gantt Chart

The figure shows the project development of the system; below is the discussion of its stages.

Planning and Analysis

In the project planning face, the developer evaluates the terms of the project. It includes data gathering, observation, and conducting of interviews. Planning also includes collaboration with stakeholders. Then analyze the data gathered from interviews and compliance in the office.

Defining of Requirements

The definition of the requirement is considered part of planning is to determine what the application supposed to do and its requirements. This stage also includes defining the resources needed to build the system. Therefore, it helps the developer decide to find the most applicable requirement according to the planning and analysis.

Database Design

The database design is a crucial part of a system. The developer uses gathered data to design a database that is appropriate for the system. The developer uses diagrams to identify the data behavior of the scheme; this includes an activity diagram, a flowchart, and a data flow diagram. The developer was able to recorded and analyzed data transactions inside the system. To implement an efficient executing query, consistency of the information, eliminate data redundancy and improve the system's performance.

User Interface Design

The user interface design is the primary communication between the user and the system. Therefore, the application interface must behave according to its usage and how users interact with the application. In this stage, the stakeholder also may suggest to the developer their preferences to help improve the system user interface.

Implementation

The implementation stage was the execution of the logical idea into a reality. After planning, designing, evaluating, and collaborating for the archive system, it has come to its conclusion. The vital part of this stage is the testing, where the developer can deploy the system to test the system's performance to do the required tasks and look for errors in the system.

Deployment

In the deployment stage, the application is available to users. The archive system is expected to be deployed inside the Records Management System. In addition, a client portal of the system will be integrated with the Central Mindanao University official website to cater to the client requests.

Maintenance

At this point, the development cycle is almost finished. The application is done and used in the field. However, the Maintenance stage is still critical. In this stage, users discover bugs that were not found during testing. These errors need to be addressed and resolved by the developer, and bug fixes, such as Iterative development plan additional features in future releases.

Documentation

The developer includes the documentation activity for monitoring the progress in the development of the system. It goes along with the development timeline, for it documents the system and processes throughout the development. It ensures that developers and stakeholders are pointing in the same direction to accomplish the project's objectives.

4.7 Testing Methodology

Since the developer uses an agile methodology in SDLC is during the testing stage of the project. Testing occurs as part of the development proves and then again in the context of the deployment process. It's critical to test an application before making it available to users. Testing ensures that each function works correctly. Different parts of the application should also be tested to work seamlessly together. The testing stage helps reduce the number of bugs and glitches that users encounter and leads to higher user satisfaction and a better usage rate.

Alpha Testing

The developer and its alpha testers conduct testing methods and test different scenarios to ensure that the system usually works and detects possible problems or deficiencies. The collected data in this stage is handled in the next iteration of the system development.

The developer uses the following as bases in every testing stage; in this case, it's Alpha Testing: System testing, Functional testing, Performance testing, Loading testing, and Compatibility testing.

Function Testing

The developer tested modules, programs, and other related system functionalities to understand the risk part of the program further and respond to the necessary action or solution to the problem identified by the developer and the Records Management Unit personnel.

Performance Testing

In this phase, the developer and RMU personnel does some trial and observation of the actual system performance during Loading and Compatibility Testing. In which, observation in real-time processing in this phase is performed.

Load Testing

This testing phase includes actual document samples and uploads information into the system. In addition, the researcher observed how the system behaves during and after information attachment and archive system.

Compatibility Testing

The developer undertook compatibility issues by checking the network components such as intranet or internet to upload electronic copy and web-server to serve as the system's controller to avoid possible computer hacking and virus attack. However, it is limited to network usernames and passwords regarding the system's protection. Furthermore, the client-side device, a computer or a mobile, is also tested to understand the behavior further and its compatibility regarding data processing and system user interface on each device.

System Testing

The actual system testing and determining the quality of clean data, time processing, and overall performance of the developed system was performed in this phase. To accomplish this phase, the developer, together with a representative of the Records Management Unit, conducted and followed software engineering techniques

and approaches in testing and quality assurance bypassing several testing phases mentioned above such as Function, Performance, Loading, and Compatibility Testing.

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APPENDICES

Use Case 1:	***Personal Information***
UC 01:	*Log in*
UC 02:	*Manage Document*
UC 03:	*Manage Request*

Use Case 2:	***Archive Transaction***
UC 01:	*Upload Documents*
UC 02:	*Dispose of Documents*
UC 03:	*Approval of Request*

Use Case 3:	***Request***
UC 01:	*Create Request*
UC 02:	*View Request*

Table 8: Use Case Suite

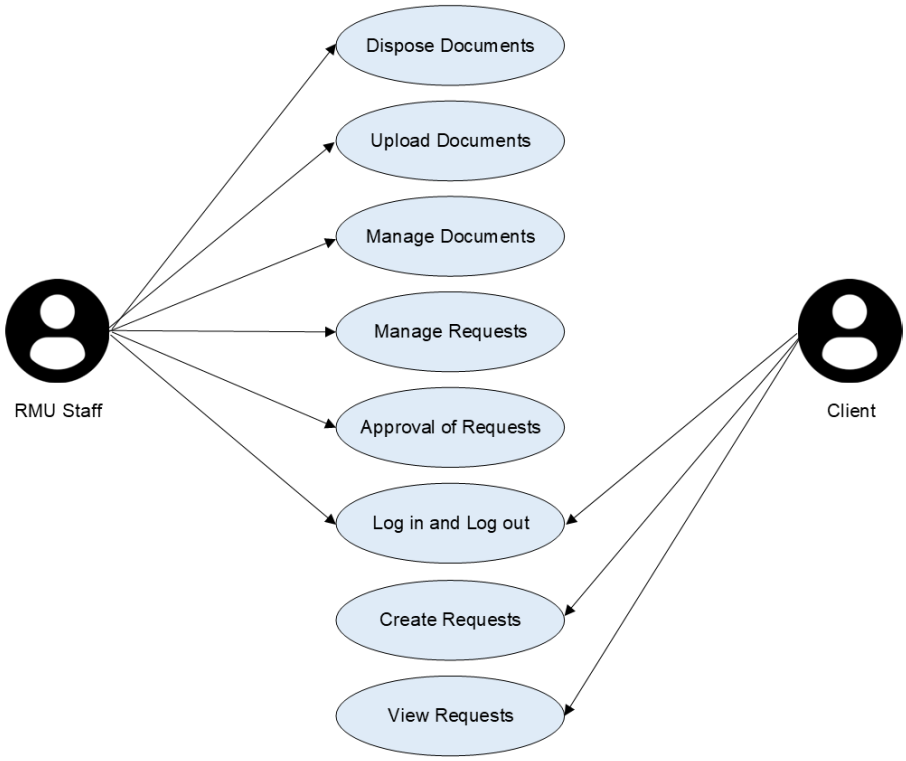


Figure 9: Use Case Diagram

Use Case#	1
UC NAME	Personal Information
Actors	RMU Staff and Client
Frequency	2
Description	The RMU Staff and Client need to log in to the system for verification and authentication. After each user is verified, each of them will be redirected to each dashboard. The RMU Staff can perform many activities such as document management, request management, adding and disposal of the documents. The client-side will also be redirected to the client dashboard.
Success Scenario	The RMU Staff will receive the client's request and send feedback, either approved or not.

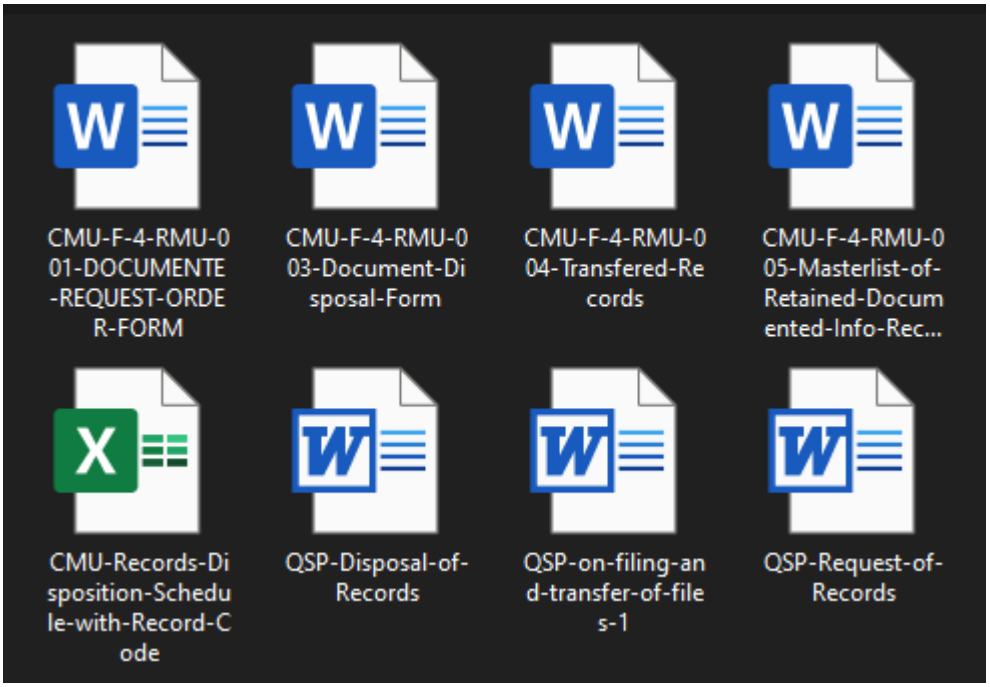
Use Case#	2
UC NAME	Archive Transaction
Actors	RMU Staff

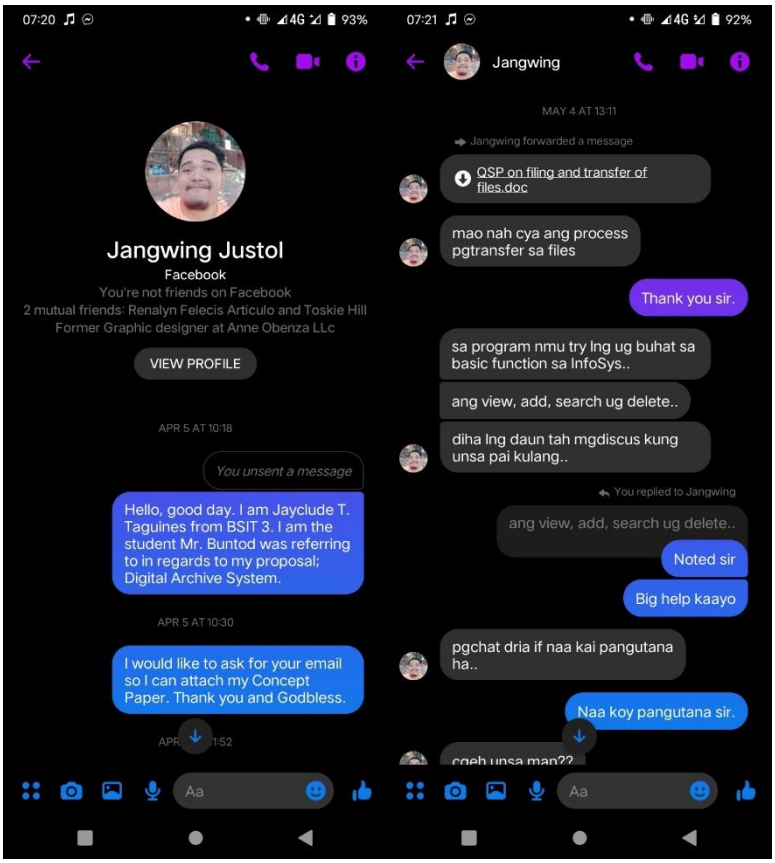
Frequency	1
Description	After the RMU Staff log in, they can now upload the new electronic documents, dispose of some documents that reached their retention period. Staff can view documents in the system, search and retrieve documents. When there are documents' requests, staff can check the request and evaluate if required fields in the request form are filled well. Then staff will now send feedback to the client of his/her request if the approved client can view the file, otherwise request another available record.
Success Scenario	The RMU Staff will receive the electronic documents to be uploaded into the system, manage the documents inside the system and evaluate client requests for a document for approval.

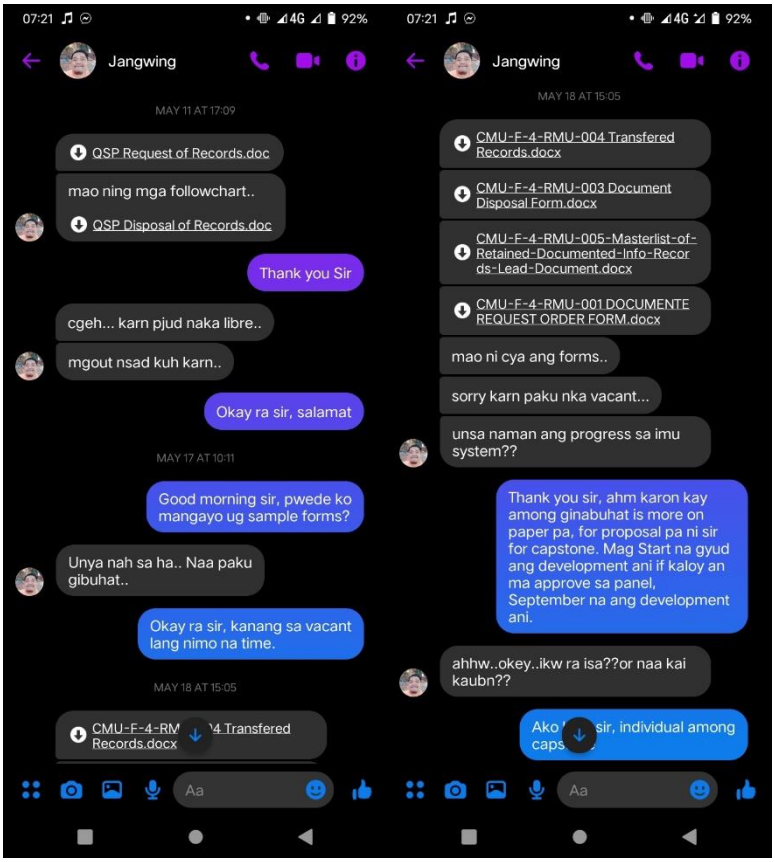
Use Case#	**3**
UC NAME	Request
Actors	Client
Frequency	1
Description	After the client logs in to the system, he/she can now request documents in the RMU by filling up the required form based on the category of the client. Then submit it to the RMU and wait for approval from the office.
Success Scenario	The client will receive feedback from the RMU based on his/her request; this consists of the approval and the view link of the document or rejection of the request due to unavailability of the requested document.

Table 9: Use Cases

DOCUMENTATION



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92%
Jangwing
MAY 11 AT 17:09
QSP Request of Records.doc
mao ning mga followchart..
QSP Disposal of Records.doc
Thank you Sir
cgeh... karn pjud naka libre..
mgout nsad kuh karn..
Okay ra sir, salamat
MAY 17 AT 10:11
Good morning sir, pwede ko mangayo ug sample forms?
Unya nah sa ha.. Naa paku gibuhat..
Okay ra sir, kanang sa vacant lang nimo na time.
MAY 18 AT 15:05
Aa
07:21
92%
Jangwing
MAY 18 AT 15:05
CMU-F-4-RMU-004 Transfered Records.docx
CMU-F-4-RMU-003 Document Disposal Form.docx
CMU-F-4-RMU-005-Masterlist-of-Retained-Documented-Info-Records-Lead-Document.docx
CMU-F-4-RMU-001 DOCUMENTE REQUEST ORDER FORM.docx
mao ni cya ang forms..
sorry karn paku nka vacant...
unsa naman ang progress sa imu system??
Thank you sir, ahm karon kay among ginabuhat is more on paper pa, for proposal pa ni sir for capstone. Mag Start na gyud ang development ani if kaloy an ma approve sa panel, September na ang development ani.
ahhw..okey..ikw ra isa??or naa kai kaubn??
Aa

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CMU - DAS

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