A Web-Based Research Repository System for the Student and Faculty Members of

Nueva Ecija University of Science and Technology

Municipality Government of Talavera

(MGT)

In Partial Fulfillments of the Requirements for the subject

Capstone Project and Research 1 (IT-CAP 01)

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Table of Contents

CHAPTER I

Background of the study

CHAPTER II

Methodology

CHAPTER 1

THE PROBLEM AND ITS BACKGROUD

INTRODUCTION

Manual document repository system is one of the problems in universities because more manuscripts are produced every semester. It is also hard for libraries to contain copies of the manuscript and often times lead to poor arrangement of library resources.

Manual systems put pressure on people to be correct in all details of their work at all times. 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 process and procedures (R. Breitmeyer, 2015).

In Nueva Ecija University of Science and Technology, NEUST the manual process of keeping the record of research manuscript that were submitted by the previous students of the university is poorly organized. The librarian of the university is struggling to manage and organize all the academic documents in the library because it is over-crowded. It is also difficult for the librarian to preserve the documents because some are missing and some are misplaced. Other documents are soaked by water due to rain, that is why some pages of the research documents are unreadable because the content of the page is almost deleted. It is also hard for the present students of NEUST to find some references that they need for the research they are conducting because researches are not well organized. Instead of immediately getting references for their studies, students have to search the entire library to find

the references that they need. Also, university faculty members also have difficulty when they need a reference for their lesson because of poorly arranged resources.

The (WBRRMS) addresses the needs of the admin staff, faculty members and students of the Nueva Ecija University of Science and Technology – Municipal Government of Talavera (NEUST-MGT). A Research Repository System allows administrator or university staff to preserve the documents in an easily manageable web-based system (cwauthors). Research repositories, usually managed by a university's library, are where the research work of the present and previous students of the university can be collected and collated for future reference and dissemination. Researchers and the broader academic community, as well as the general public in some cases, can benefit from the research of others.

The web-based research repository system can assists university faculty members and students in looking for past and present research insights quickly. On the other hand, the Web-based RRMS can provide ideas to the faculty members for their next lesson that they can educate the students with advance academic and the faculty committees will no longer go to the library to look for the information they needed for teaching their students. Manuscripts will be made available virtually.

REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literature and system conducted locally and in other countries which are related to the present study and have provided some insights about the present study. The information gathered will serve as the path for the researchers on how to deal with this study.

According to Sweeper and Ramsden (2020) a research repository is a critical component of establishing a new research plan and providing the incentive for fostering a research culture at a university. As universities work toward becoming leaders in research, showcasing research outputs, introducing it to a global audience becomes a priority.

In addition Repositories for research are typically informed by funding for research mandates and often allow access and availability of research data to promote trustworthiness and transparency in the research process, thereby improving citations, and validate research conclusions through re-analyzing data to answer different research questions, as well as facilitate new discoveries (Elsevier, 2019; Ülikool, 2020).

Institutional repositories comprise the various outputs of the institution as well as teaching and learning materials. Some institutional repositories have elements of current research information system that is useful for scholar profiles, funding, and publishing activities (Ülikool, 2020).

According to Nunda, I. & Elia, E. (2019) The study recommends academic libraries to establish embedded IL programs to increase adoption and usage. The study also suggests improving the quality of resources in the institutional resources to reflect students' needs.

Nwokedi, V.C., Nwokedi, G.I (2018). Institutional Repositories make it possible to collect content in one location, capture and provide open access to the intellectual output of a university, as well as preserve content that may be otherwise unavailable or out of publication. It is essential to explore the benefits as well as the challenges of Institutional Repositories to make sure it is worthwhile to the library as well as the institution.

(Mesa , 2017) Ferguson an author of the article entitled Open Educational Resources and Institutional Repositories, it was stated that it is most efficient way to save time and making it easy when building an institutional archive is to use open educational tools. The developers examine the article and come up with the idea that it will be useful for all future users of the system by means of preserving the research papers and any other paper works of the faculty staff together with the students of the university and as a result of the beneficiary for all users who will be soon as future developer.

(Mesa , 2017) The developers would like for the departments of the university must be expected to access records of manuscripts

to the System in order for every manuscript to also be deposited in the database

Okon, R., Eleberi, E. L., & Uka, K. K. (2020). An Institutional Repository consists of formally organized and managed collections of digital content generated by faculty, staff and students at an institution. This is the collective intellectual output of an institution, recorded in a form that can be preserved and exploited.

Singh (2016). The author used three Asia-Oceania district universities as case study which includes: University of Hong-Kong, University of Malaya and Charles Darwin University. Interview was used to gather data on the development of institutional repositories. From findings of the study, the authors formulated a standard set of instructions to guide any organization that wishes to build open access repositories.

Singh (2017) examined the open-access IRs in Australia by selecting the database of Directory of Open Access Repositories.

Das & Singh (2017) To fulfill the specified objectives, the Open access institutional repositories in China were identified by selecting the database of Directory of Open Access Repositories (Open DOAR), and the data were collected and analyzed for the necessary information. The study highlights the current status of open access institutional repositories in China and its contribution to a global knowledge base.

Singh & Verma (2017) conducted a study to discover the current status of open access institutional repositories of Asian

countries. It determines individual country and number of records archived, subjects and core contents, language interface for sharing of information, various software used to create open access IRs and their operational issues.

Wohlrabe, and Bornmann (2019) affirmed that any research project carried out and formally documented to fulfill university or college requirement qualifies as an academic publication e.g. Essays, Thesis and Dissertation, Books, Research articles, Abstract, Translations, Conference papers and the rest of them. It can also be referred to as documents presented at conferences which are consulted by students, academics and researchers.

By Sweeper and Ramsden (2020) a research repository is a critical component of establishing a new research plan and providing the incentive for fostering a research culture at a university. As universities work toward becoming leaders in research, showcasing research outputs, introducing it to a global audience becomes a priority.

Institutional repositories comprise the various outputs of the institution as well as teaching and learning materials. Some institutional repositories have elements of current research information system that is useful for scholar profiles, funding, and publishing activities (Ülikool, 2020).

Repositories for research are typically informed by funding for research mandates and often allow access and availability of research data to promote trustworthiness and transparency in the research process, thereby improving citations, and validate research conclusions through re-analyzing data to answer different

research questions, as well as facilitate new discoveries (Elsevier, 2019; Ülikool, 2020). Faculty and departmental research repositories can be found within this range.

Funding agencies often seek data management plan along with the research proposal. Building of mandatory DMP into project proposals has been found interesting by the researchers as well (Posavec, et al., 2020). But this is possible when the funding also includes for the accretion of data generated out of research and when the volume of data is big and data sets are large.

The authors further suggested that training and other professional development programmes for librarians should include topics on marketing. Additionally, in their efforts to develop strategies for the use of open access institutional repositories in universities in Ghana, Kodua-Ntim and Fombad (2020).

Nwokedi, V.C., Nwokedi, G.I (2018). Institutional Repositories make it possible to collect content in one location, capture and provide open access to the intellectual output of a university, as well as preserve content that may be otherwise unavailable or out of publication. It is essential to explore the benefits as well as the challenges of Institutional Repositories to make sure it is worthwhile to the library as well as the institution.

Conceptual Framework

Input	Process	Output
• Research papers and data sets from faculty, students, and staff members • Funding information for research projects • Institutional policies on data management and sharing	• Storage and organization of research papers and data sets in a secure repository that complies with institutional policies and data management best practices. • Curation and metadata tagging of research papers and data sets to enhance discoverability and facilitate reuse. • Management of access and usage permissions based on	• Searchable and discoverable database of research papers and data sets that reflect the scholarly output of the institution. • Metrics and analytics on research paper and data set usage and impact • Tools for collaboration and communication among researchers, such as discussion forums, shared

	institutional policies and data sensitivity levels. • Preservation of research outputs over the long term to ensure their accessibility and usability in the future.	annotations, and research networking features. • Access to research materials for the university community, including open-access publications and data sets. • Compliance with funder and institutional policies on data sharing and management.

Definition of Terms

1, **NEUST-MGT RRS –** Nueva Ecija University of Science and Technology-Municipality Government of Talavera Research Repository System.

2. **Research Documents -** refer to the written records and materials produced during the research process. These documents may include primary and secondary sources of information, such as reports, academic articles, datasets, surveys, interview transcripts, field notes, and other research-related materials.

3. **Research Repository -** is a digital platform or database that serves as a central location for storing and sharing research-related materials, such as publications, datasets, research documents, and other scholarly works. Research repositories are typically designed to support open access, meaning that the materials stored in the repository are freely accessible and available to the public.

4. **Administrator/Librarian -** This refers to the administrative staff or personnel who are responsible for managing and maintaining the research repository system. Admin has full management access to the system, including the ability to add, modify, and delete user accounts, research documents, and metadata.

5. **Faculty member -** This refers to the academic staff or faculty members who contribute to the research repository system by depositing their research output or using the system to access research materials. Faculty members have permission to upload and download research documents from the repository. Faculty members may include researchers, scholars, and other academic staff who

are affiliated with the institution or organization that hosts the research repository system.

6. Students - This refers to individuals who use the research repository system to access research materials. In this context, students have view-only access to the research documents stored in the repository. Students may include undergraduate or graduate students who are affiliated with the institution or organization that hosts the research repository system.

7. Metadata - is data that describes other data. In other words, it provides information about a particular dataset, document, or resource. It can include descriptive information about the content, format, location, and ownership of a resource, as well as other details such as authorship, creation date, and keywords. Metadata is important for managing, discovering, and using digital resources, as it helps users find and understand information in a more efficient way. In the context of a research repository system, metadata may be used to provide additional information about research documents, such as the title, author, publication date, abstract, subject keywords, and so on. This information can be used to help users search, browse, and filter the documents in the repository, and to provide context and provenance information for the documents.

STATEMENT OF THE PROBLEM

This study seeks to answer the following question:

- How may the system be develop using the sequential phases of SDLC incremental model?
- What would be the benefits of the RRDMS to the users?
- How may the system will help the users to meet their needs?

OBJECTIVES OF THE STUDY

This study aimed to develop a Web-Based Research Repository Management System that provides administrators a tool to monitor and manage records of manuscripts submitted by graduates of the Nueva Ecija University of Science and Technology (MGT). This includes the following goals.

- To develop a well-organized research repository system for NEUST (MGT)
- To design a system that meet the needs of the user
- To secure and preserve all research documents in an easily manageable database system

SIGNIFICANCE OF THE STUDY

The study of a research repository management system can have significant implications for different stakeholders, including students, administrators/librarians, faculty members, the school, and future researchers.

Students. A research repository management system can provide students with access to different researches produced in the campus.

Administrators/Librarians. The system can help administrators and librarians to improve their services and policies related to the repository system, and to better align them with the goals and values of the school and its stakeholders.

Faculty Members. Faculty members can benefit from the research repository management system by accessing and sharing their research outputs and accessing other researches as well.

Future Researchers. The study of the research repository system can generate valuable insights and knowledge that can inform future research and development in the field of digital libraries and information science.

Scope and Delimitation

This study was conducted in Nueva Ecija University of Science and Technology in the year 2023. It is a web-based system that can only be used by the admins, authorized faculty member and students of the university. The RRMS is only open for the students of the campus, unlike other research repository system that is available for all individuals. Only the administrators of the campus can manage the entire system. The role of the faculty member and students are not the same, they have different capabilities when they use the system. The faculty member can search, upload and download a research document in PDF form, and the students are only allowed to view research documents, and they are prohibited to copy and paste the manuscript. The RRS also requires internet connection to access the system because it is a web-based system.
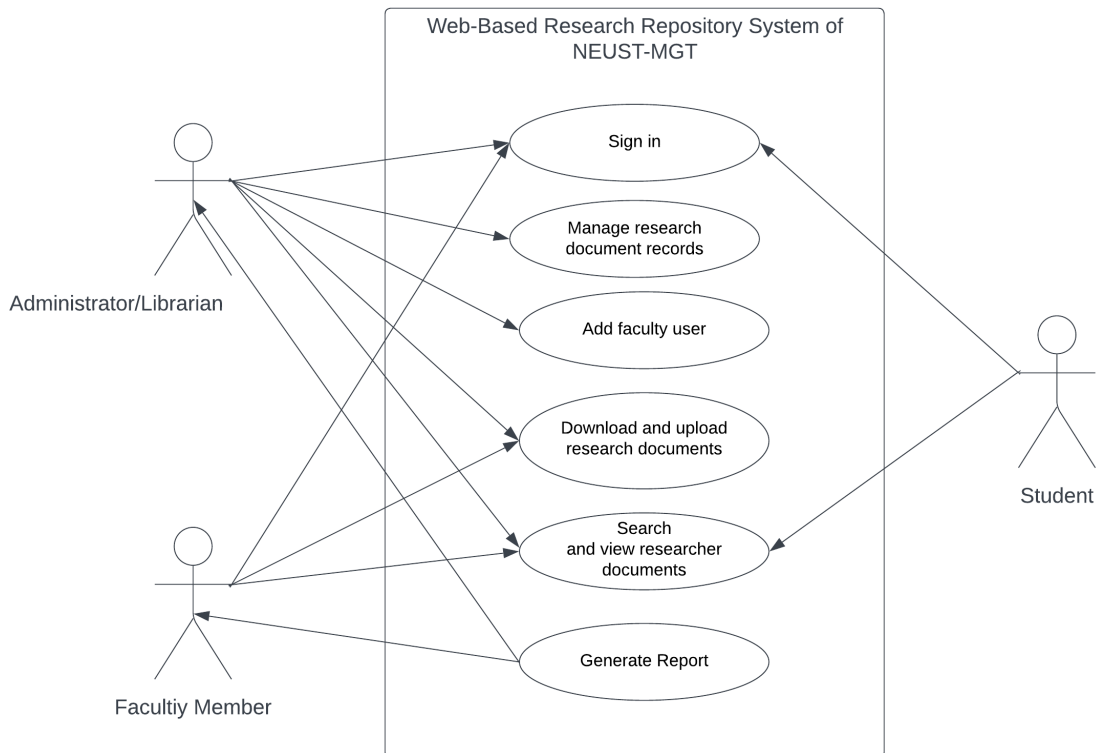
METHODOLOGY

USE CASE DIAGRAM

Figure 1. Use Case Diagram

     Figure 1 illustrates the use case diagram of the administrator, faculty member and students. The administrator can perform necessary actions such as login, manage the research document records. The faculty member can perform login, upload and download research documents and for the students they can only perform login and view research documents.

ENTITY RELATIONSHIP DIAGRAM
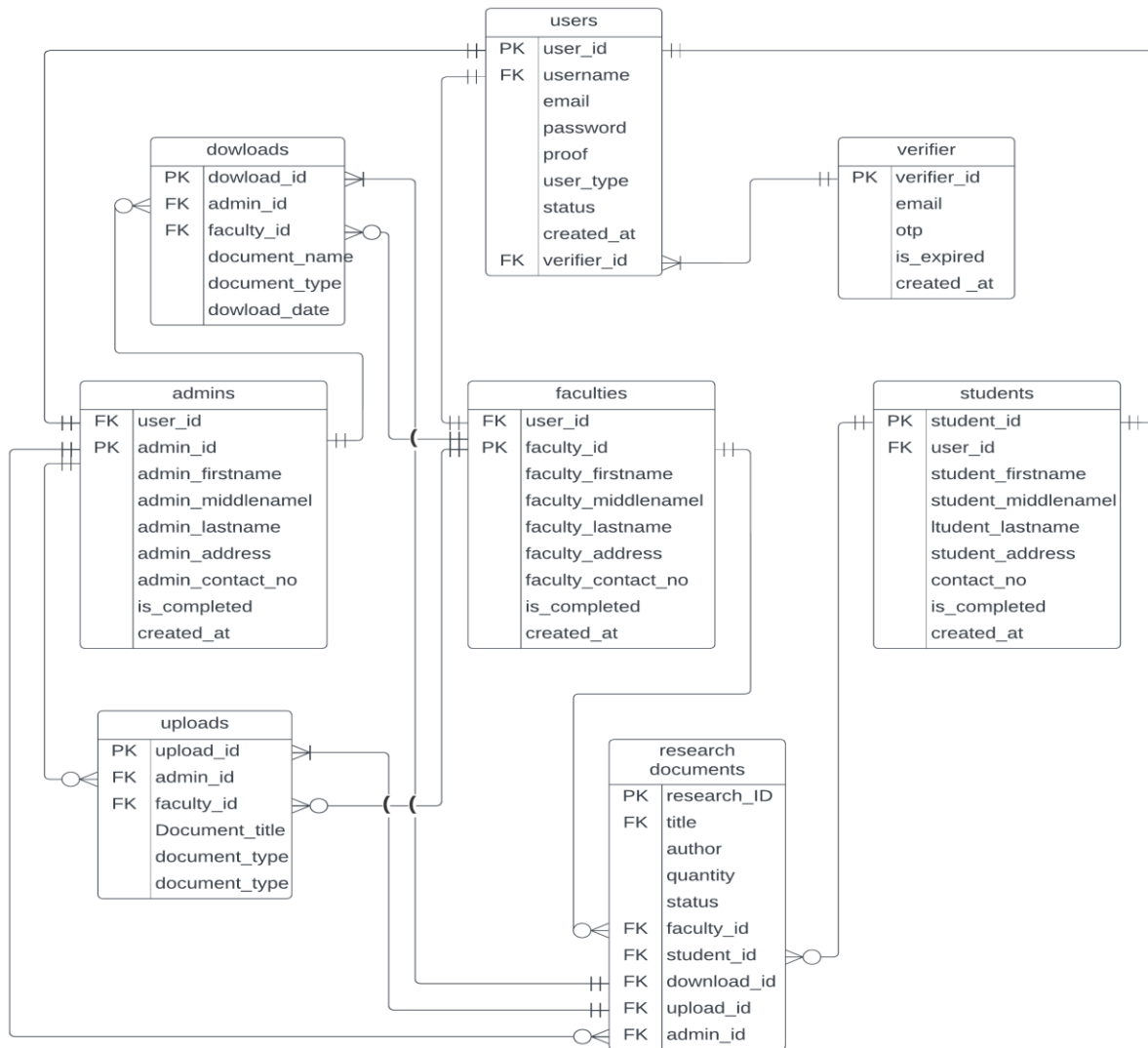

Figure 2. Entity Relationship Diagram

Figure 2 illustrates the tables and fields used in the creation of the system. It also shows the relationship among the tables in the databases.

DFD – CONTEXT DIAGRAM
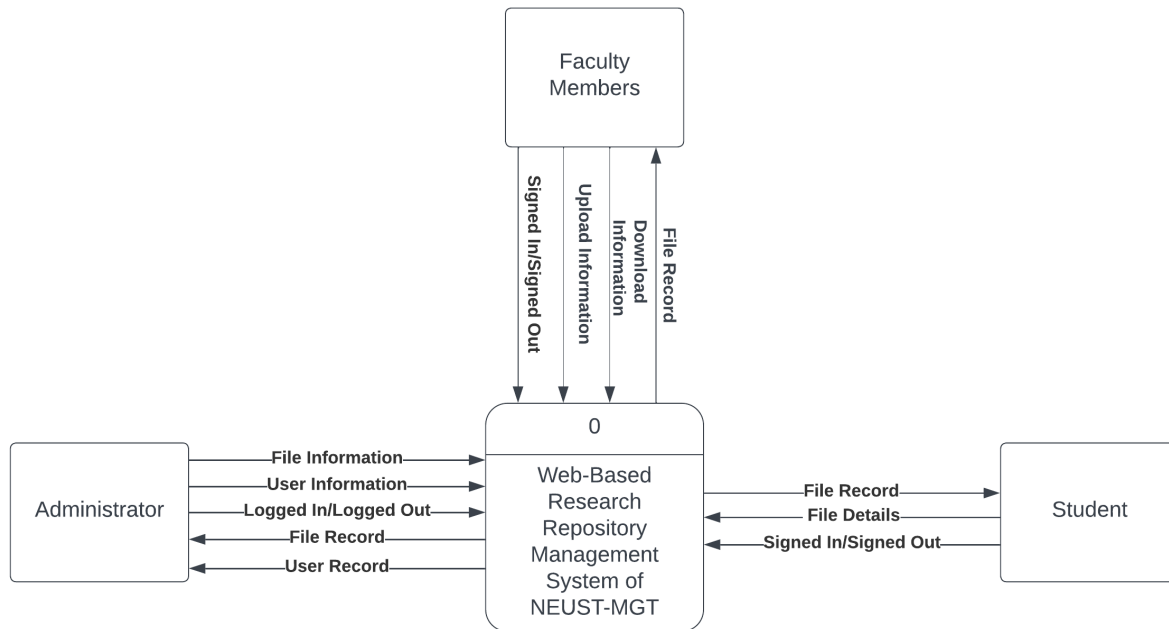
Figure 3. Context Diagram

Figure 3 illustrates the context diagram of the proposed system and how it works. The figure shows on how the end-users may use the proposed system.

DATA FLOW DIAGRAM LEVEL 0
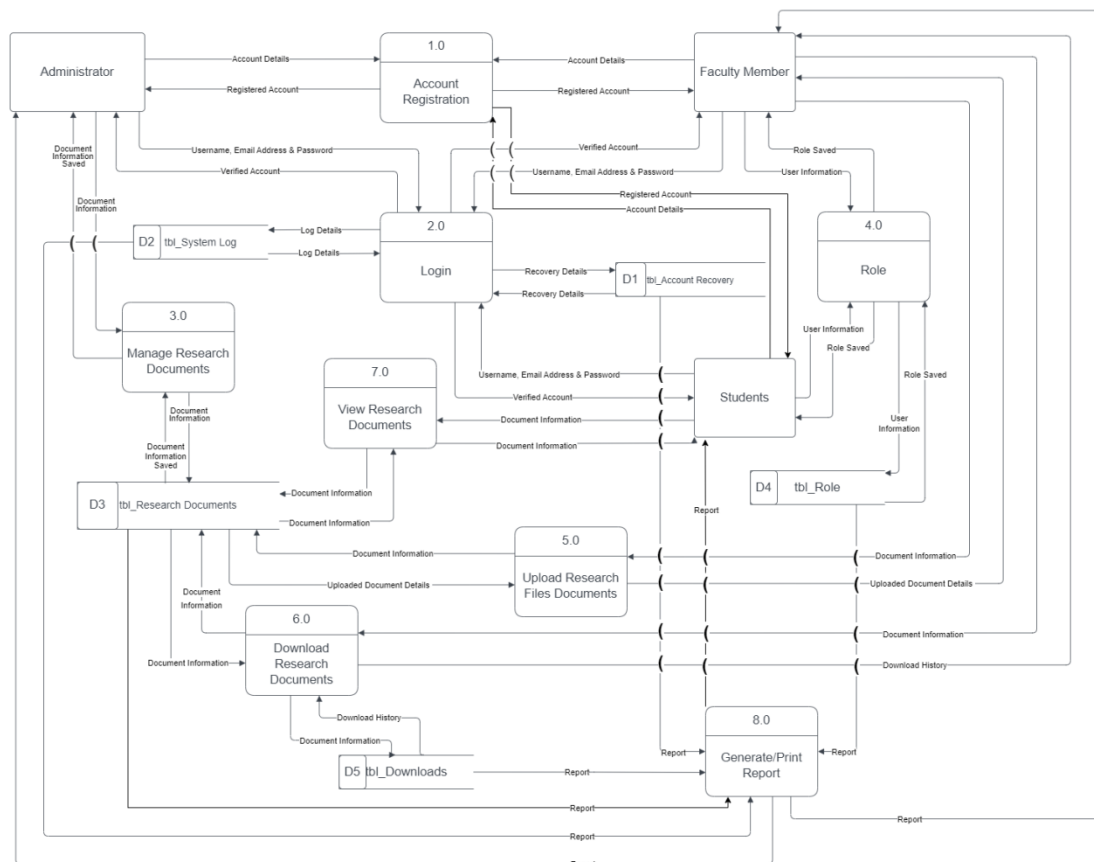
Figure 4. Data Flow Diagram Level 0

Figure 4 illustrates the whole process of the system and how the data flows in the system.

DFD - LOGIN LEVEL 1
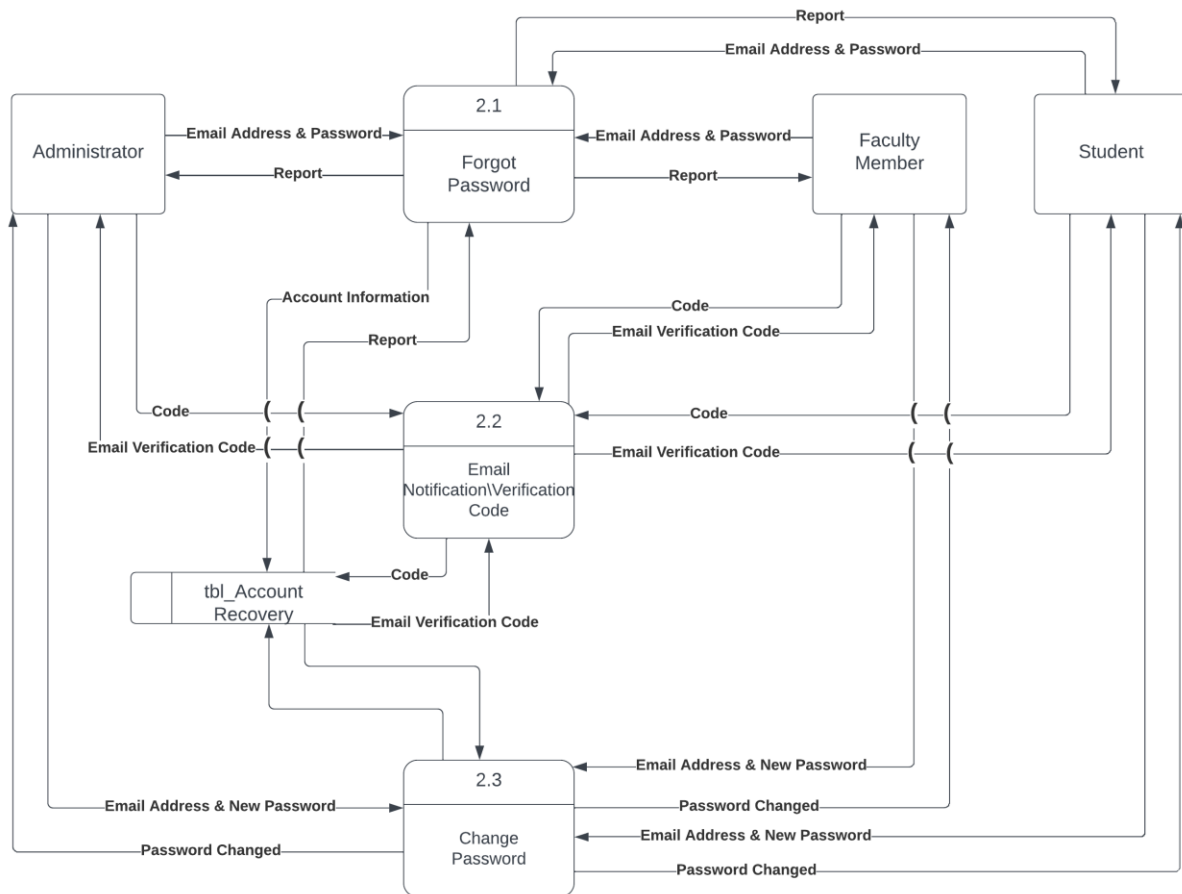
Figure 5. Data Flow Diagram Login Level 1

Figure 5 illustrates how the users login to the system and how they can recover their accounts and change their password in case they forgot it.

DFD – ROLE LEVEL 1
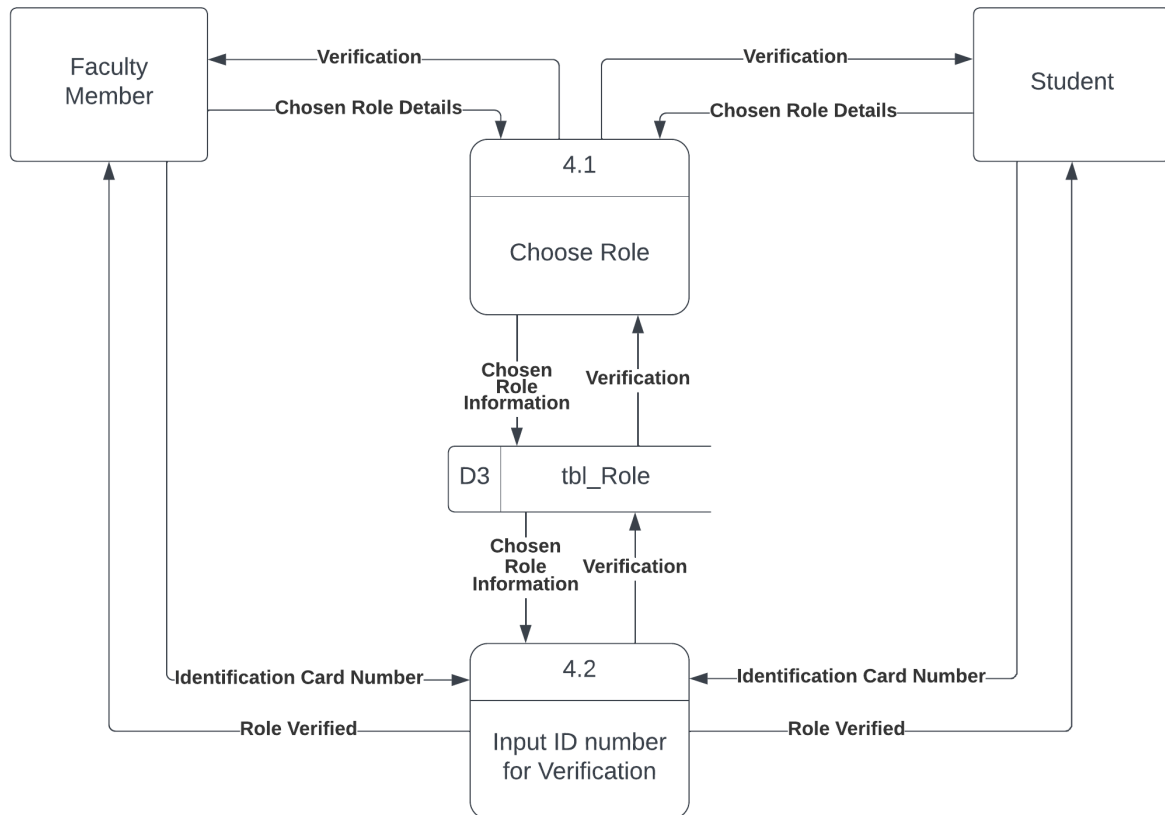
Figure 6. Data Flow Diagram Role Level 1

   Figure 6 illustrates how the users can choose their roles.

DFD- MANAGE RESEARCH DOCUMENT LEVEL 1
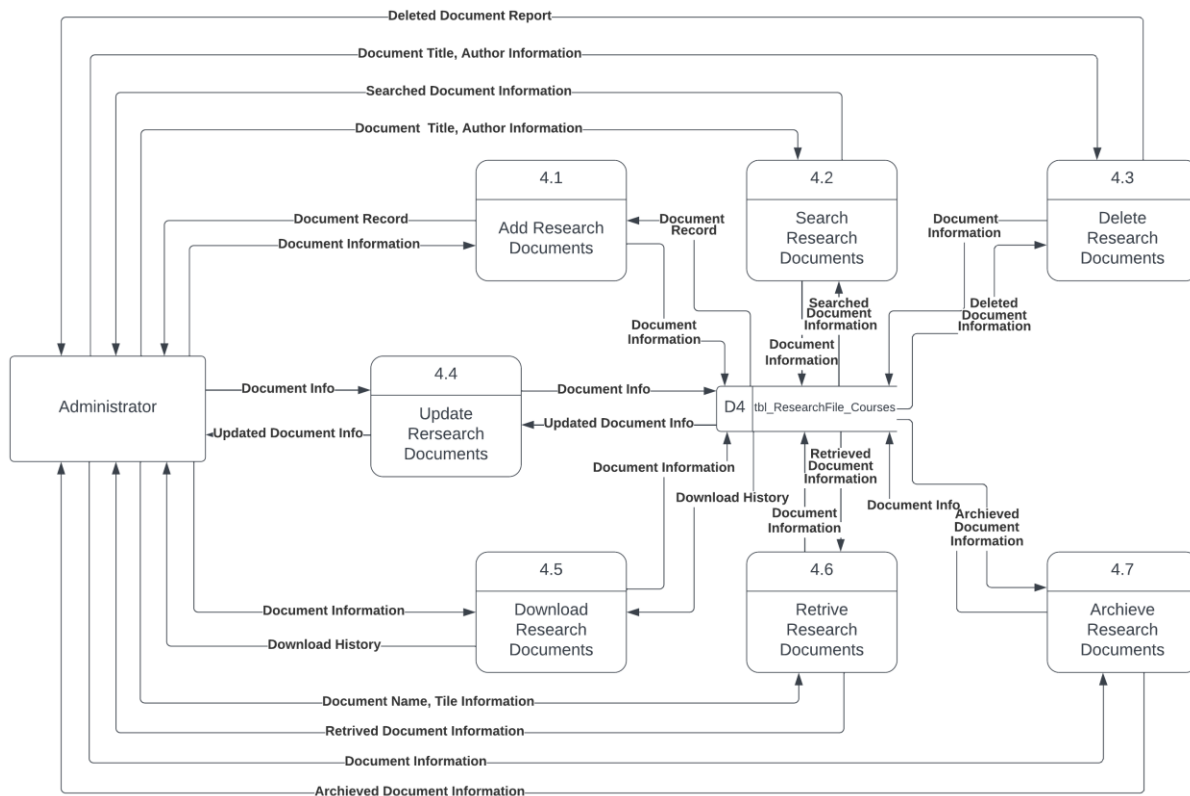
Figure 7. Data Flow Diagram Manage Research Document Level 1

Figure 7 illustrates how the administrator can manage the research documents. This includes the adding, searching, deleting, updating, downloading, retrieving and archiving of the documents.

DATA DICTIONARY

Table 1 – tbl_Administrator

Type	Attribute	Description	Data Type	Length	Required	Example
PK	admin_ID	Primary key of the admin user	int	11	Yes	123456789
	admin_Username	Username of the admin	varchar	40	Yes	Admin123
	admin_EmailAddress	Email Address of the admin	varchar	40	Yes	Admin@gmail.com
	admin_Password	Password of the user	varchar	40	Yes	*********
	admin_ProfilePic	Profile picture of the admin user	longblob	–	Yes	–

Table 2 – tbl_Faculty Members

Type	Attribute	Description	Data Type	Length	Required	Example
PK	facultymembers_ID	Primary key of the faculty member user	int	11	Yes	123456789
	faculty_Username	Username of the faculty member	Varchar	40	Yes	Faculty123
	faculty_EmailAddress	Email Address of the faculty member	Varchar	40	Yes	Facultymember@gmail.com
	facultymember_Password	Password of the faculty member	Varchar	40	Yes	*********
	facultymember_ProfilePic	Profile picture of the faculty member user	longblob	–	Yes	–
	facultymember_Status	Faculty member status	Varchar	20	Yes	Instructor
FK	role_ID	Role of the user	Int	2	Yes	Faculty Member

Table 3 - tbl_Student

Type	Attribute	Description	Data Type	Length	Required	Example
PK	student_ID	Primary key of the student user	int	11	Yes	123456789
	student _Username	Username of the student	varchar	40	Yes	Student123
	student_EmailAddress	Email Address of the student	varchar	40	Yes	student@gmail.com
	student_Password	Password of the student	varchar	40	Yes	*********
	student _ProfilePic	Profile picture of the student user	longblob	–	Yes	–
	student_Course	Course of the student	varchar	20	Yes	BSIT
	student_Year&Section	Year and section of the student	varchar	20	Yes	3-D
FK	role_ID	Role of the user	varchar	10	Yes	Student

Table 4 – tbl_Account Recovery

Type	Attributes	Description	Data Type	Length	Required	Example
PK	verification_code	Code number for account recovery	int	11	Yes	256784
FK	facultymember_ID	Foreign key for the faculty members	int	11	Yes	123456789
FK	admin_ID	Foreign key for the admin	int	11	Yes	123456789
FK	Student_ID	Foreign key for the students	int	11	Yes	123456789
	old_password	old password of the user	varchar	20	Yes	*********

Table 5 – tbl_System Log

Type	Attributes	Description	Data Type	Length	Required	Example
PK	Log_ID	System log ID	int	11	Yes	1
FK	facultymember_ID	Foreign key for the faculty members	int	11	Yes	123456789
FK	admin_ID	Foreign key for the admin	int	11	Yes	123456789
	log_details	System log details	varchar	40	Yes	–
	time_date_log	System log time and date	datetime	Datetime	Yes	2020/12/12 12:00:00
FK	student_ID	Foreign Key for the student	int	11	Yes	123456789

Table 6 - tbl_Research Documents

Type	Attributes	Description	Data Type	Length	Required	Example
PK	document_ID	Unique identifier for the research document	int	11	Yes	123
FK	facultymember_ID	Foreign key for the faculty members	int	11	Yes	123456789
FK	admin_ID	Foreign key for the admin	int	11	Yes	123456789
FK	student_ID	Foreign Key for the student	int	11	Yes	123456789
	courses	NEUST's courses	varchar	20	Yes	BSIT
	title	Title of the document	varchar	40	Yes	Web-based Research Repository
	author	Author of the document	varchar	40	Yes	Jerick Mananghaya
	year_Completed	Document year completed	date	-	Yes	March 28, 2023
	size	Document size	varchar	40	Yes	300kb

	type	Document type	varchar	10	Yes	PDF
	uploaded_at	Date and time updaloaded	datetime	-	Yes	2023/12/12 12:00:00
	uploaded_by	Uploader of the document	varchar	40	Yes	April

Table 7 – tbl_Role

Type	Attributes	Description	Data Type	Length	Required	Example
PK	role_ID	Unique identifier for user role	int	11	Yes	123456789
	role_Description	Description of the role	varchar	40	Yes	–
	role_Name	Name of the role	varchar	10	Yes	Student

Table 8 – tbl_Downloads History

Type	Attributes	Description	Data Type	Length	Required	Example
PK	Download_ID	Unique identifier for ownload history	int	11	Yes	123456789
FK	Facultymember_ID	Foreign key for the faculty member	int	11	Yes	123456789
FK	admin_ID	Foreign key for the administrator	int	11	Yes	123456789
FK	document_ID	Foreign key for the document	int	11	Yes	123456789
	file_Name	Name of the document	varchar	40	Yes	Research Repository
	file_Size	Size of the document	varchar	2	Yes	300kb
	file_Type	Type of the document	varchar	10	Yes	PDF
	download_Date	Date dowloaded	date	–	Yes	2023/12/12

RESEARCH LOCALE

    The research will be conducted at the Nueva Ecija University of Science and Technology (NEUST), Talavera Academic Extension Campus located at 400 Diaz St, Pag-asa District, Talavera, Nueva Ecija.

RESEARCH RESPONDENTS

Research Respondents

Stratified sampling method is the chosen sampling method to gather respondents for this capstone project. Stratified sampling method can be useful for research on a research repository system.

1. Representative Sample: The stratified sampling method ensures that the sample of respondents is representative of the population. By stratifying the population based on relevant variables, the sample will include respondents from all subgroups in the population, which can increase the accuracy and reliability of the research findings.

2. Reduced Sampling Error: Stratified sampling can reduce sampling error compared to simple random sampling. By ensuring that the sample includes respondents from all relevant subgroups, the variability within each subgroup is reduced, which can improve the precision of the estimates.

3. Increased Precision: Stratified sampling can increase the precision of the estimates for specific subgroups in the population. By obtaining a larger sample size for subgroups that are important or of interest, the precision of the estimates for those subgroups can be increased.

4. Comparability: Stratified sampling can increase comparability between subgroups in the population. By ensuring that the sample includes respondents from all subgroups, it becomes possible to compare the responses of different subgroups to the same set of questions or stimuli.

Overall, using the stratified sampling method can increase the accuracy and reliability of the research findings for a (RRS) by ensuring that the sample of respondents is representative of the population and reducing sampling error. It can also increase comparability between subgroups and improve the precision of the estimates for specific subgroups of interest.

Table 1. Distribution of Respondents

Respondents	No. of Respondents
Administrator/Librarian	
Faculty Members	
Students	
Total	

Given that the target population for this capstone project are the administrator/librarian, student and faculty members, utilizing stratified would enable the researchers to gather data quickly and efficiently from those who are readily available and willing to participate.

RESEARCH INSTRUMENTS

In this capstone project, two instrument will be used to gather data from the users of the Web-based Research Repository Management System for the students and faculty members of NEUST Talavera off Campus. The first instrument is an **interview,** which will be used to gather information about the requirements of the system based on the user's needs. An interview is a technique to gather data that involves asking questions to gather information directly from the participants. This method is useful in understanding the needs of the user and their preference for the system. The interview will be conducted personally.

The second instrument is a **survey,** which will be used to gather feedback from the users of the system. A survey is a data collection technique that involves asking questions to gather information from participants. This method is useful in understanding the user's experience with the system and their satisfaction with its features. The survey will also be conducted face-to-face.

The combination of the interview and survey methods will provide a comprehensive understanding of the user's requirements and user's feedback.

DATA GATHERING PROCEDURES

Data was gathered by means of survey that was conducted in NEUST-MGT. A survey was defined to query (some-one) in order to collect data for the analysis of some aspect on a group or area. One of the benefits of using surveys in research is that they allow researchers to gather a large quantity of data relatively and quickly and cheaply. A survey can be administered as a structured interview or as a self-report measure, and data can be collected in person.

DATA ANALYSIS

The study will involve the administration of a **4-point Likert scale** survey questionnaire to participants.

Likert scales are commonly used in surveys to measure respondents' attitudes, perceptions, and opinions about a particular topic. They are an effective tool for interpreting feedback about the system because they allow respondents to indicate their level of agreement or disagreement with a statement on a numerical scale. The responses can then be analyzed quantitatively, making it easier to identify patterns and trends in the data.

According to **Babbie (2016),** Likert scales provide a structured and standardized approach to measuring attitudes and opinions. They offer a range of response options that can capture the degree of agreement or disagreement with a statement, and their numerical nature allows for easy data analysis. Therefore, using the Likert scale in the questionnaire can help provide valuable insights into users' perceptions of the system.

To determine the respondent's feedback, the weighted mean from the Likert scale was used. In determining the numerical value of each item, the researchers used the following formulas:

Percentage	Weighted Mean
% = F/N (100)	WM = TWF/N
Where:	Where:
% = Percentage	WM = Weighted Mean
F = Frequency	TWF = Sum of Weighted

N = Number of Respondents	Frequency N = Number of Respondents

For verbal interpretation of the weighted mean, the scale below was used:

Intervals	Description
3.50 – 4.00	Strongly agree
2.50 – 3.49	Agree
1.50 – 2.49	Disagree
0.50 – 1.49	Strongly Disagree

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