SU ‘Academic Databank’: A Digital Archive for Silliman University Academic Papers

A Capstone Project presented to the faculty of the College of Computer Studies
Silliman University

In partial fulfillment of the

Requirements for the degree of

Bachelor of Science in Information Technology

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TABLE OF CONTENTS

List of Figures

List of Tables

Chapter 1:
Introduction and Background of the Study

1.1 Introduction

It is challenging for students to grasp new concepts that will change our world as most of the concepts that are thought of have already been accomplished. The challenges of making an academic paper, thesis or capstone project is quite a task to overcome, but finding a close reference on what idea that you have come up with is also another task to accomplish. However, technology is growing fast and evolving throughout the years and with the COVID-19 pandemic still occurring new norms (which includes limited access to physical libraries and classrooms) take shape in the modern society, students and faculty are taking advantage of the technologies that are offered, especially when it comes to accessing academic material.

The Academic Databank is an online resource that primarily houses a collection of outstanding theses, capstone researches and academic documents submitted by Silliman University students. It incorporates elements and pieces from all of the University's colleges, institutes, and schools. While the Silliman Library has a dedicated section for Academic Materials such as these, students are not allowed to take them out of the campus and can only be borrowed and read within the school library. This online database would make it easier to access this data, as it can be accessed anywhere with an internet connection, and because it is a free service for Sillimanian Students and Sillimanian faculty and staff.

1.2 Objectives of the Study

The construction of an academic databank aims to strengthen the student body's research capacity as a tool for community development, to create and maintain a database focused on delivering credible information to aid academic and research practices for students, and provide a healthy environment where students can obtain knowledge beyond the four walls of their classrooms.

To ensure the quality of the academic output, the proposal must have been submitted to the relevant offices for ethical problems that may emerge prior to the conduct of the study. After completion, the output must also be submitted to relevant offices for review and approval before being included in the academic databank.

1.3 Scope and Limitations

Scope

The current and the most efficient method for searching reliable resources for students taking on research and thesis is searching for the sources online. This study aims to make that method better and find sources easier by developing a databank that holds the research and thesis papers of past students. The databank will be a web application and will be used specifically by the students and faculty of Silliman University.

The web application that caters to the students will have the following features;

- Restriction feature on copying text
- Keywords search engine
- Categorization of output based on which college, institute in school
- Process of how to publish their work
- Filter option (based on research interest)
- Categorization based on nature of output
- Bookmark feature
- Automated citation options

Limitations

The SU Academic Databank will be limited to Senior high school students, college students and faculty in Silliman University. All papers may be viewed in full but cannot be downloaded. The SU Academic Databank will be limited to a web application that will require an internet connection to access the databank.

1.4 Significance of the Study

The SU Academic Databank is significant because it has the potential to be the University's top auxiliary resource for secure, accurate, and verified material that is simple for students to use as a tool to support and enhance their research abilities and instill a deep respect for the arts and culture, ultimately contributing to nation-building.

1.5 Definition of Terms

Table 1 - Definition of Terms

TERMS	DEFINITION
SU Academic Databank	A web application that hosts a well-organized and maintained collection of academic papers submitted by Silliman students for easy consultation and use.
Academic Material	Documentations of CAPSTONEs, Theses and Academic documents, academic outputs and scholarly papers produced by Sillimanians.
Users	The users are people who will use the SU Academic Databank and can either be categorized as Faculty or Student.

Chapter 2:
Review of Related Literature and Systems

2.1 Review of Related Literature (If Applicable)

Data banks are a new form of information storage that allows the user to store, create, edit and share their data in the cloud.It is simple to obtain files from other internet users, and these services make it simple to distribute them. Data banks are gaining popularity because they make it simple for consumers to maintain track of their personal information. They are also becoming a key tool for businesses since they help them to boost production and efficiency [1]. This would be the main goal of the SU Academic Databank to make students and faculty finding information and sources much easier and faster.

According to Hannah Diane in February 2022, there are many instances where companies need to store data for a number of years in advance. It can be challenging to remember all the different data points for each account and their corresponding individual contacts. With things like marketing lists, database management, and customer service, it is important to have a database bank that keeps your information in one place so you don't have to go through reams of paper or resort to hard-to-find spreadsheets[1].

Aside from making it easier for students to find the resources they need, a Databank can keep everything organized and up to date in just one place.

For clarification, databank and database are quite similar. The difference is, a database is a collection of tables which is used to capture and analyze data from users or applications, whereas a databank is a repository that will keep data safe in the long term. It's a large repository of computer data on a particular topic, sometimes formed from more than one Database, and accessible by many users[2].

Systems such as UP's Digital Archive, the database that holds a number of papers belonging to different categories such as Personal Papers, Presidential Papers, Theses and Dissertations, University Records, and UPIANA[5]. This will also hold true with the Silliman Academic databank, however some features shown in UP's databank will be excluded in this project. One of the reasons why a databank or a digital archive would be helpful to Silliman University is because it would give librarians greater insight on research trends and highlights which titles are most influencing emerging scholarship at any one time[3].

According to Charlesworth Author Services, the availability of an internal infrastructure for maintaining and organizing digital content is becoming increasingly crucial, as the expense of obtaining and preserving physical copies of books, journals, and student submissions is a hardship for most institutions. There is simply a limited amount of room available within colleges, namely in libraries, to keep such a large volume of written literature[4].

2.2 Review of Related Systems

UP Diliman Digital Archives

The UP Dilliman Digital Archives is the official Institutional Repository of the University of the Philippines Diliman. It is hosted and maintained by the University Library, University of the Philippines Diliman. The database holds a number of papers belonging to different categories such as Personal Papers, Presidential Papers, Theses and Dissertations, University Records, and UPIANA. Students are able to upload their own works for a wider reach of audiences while the copyright of the author and the University is protected. As of now there are over 3,000 papers altogether that are available for the public to view. [5]

De Lasalle Medical and Health Science Institute "GreenPrints"

GreenPrints, the institution's repository, stores electronic research outputs, publications, creative works, learning objects, institutional records, and other knowledge assets of De La Salle Medical and Health Sciences Institute students, professors, and staff. The platform acts as a source of inspiration for those both inside and outside of the DLSMHSI community. It also contributes to the Institute's goals of responsible environmental stewardship by offering paperless access, storage, and administration of its holdings via electronic methods. The repository is accessible to both students of De La Salle and the general public. [6]

The University of Hong Kong "The HKU Scholars Hub"

The HKU Scholars Hub is the University of Hong Kong's current research information system (CRIS). It seeks to promote chances for collaboration as well as increase the exposure of HKU authors and their research. It is an important tool for HKU's Knowledge Exchange, one of the three pillars of the university's goal for the years 2016 to 2025. The Hub collects, maintains, and disseminates HKU's intellectual output in digital form. It allows open access to academic materials such as HKU theses and postprints, according to the publisher's policy. [7]

University of Cambridge "Apollo"

Apollo is the name of the institutional repository at the University of Cambridge. It was established in 2003 as a service to publicize the results of the university's research. The Repository will be used to keep and preserve the research findings of the University. The repository contains a variety of research outputs, including publications, conference proceedings, book chapters, monographs, theses, various forms of research data, presentations, and more. Apollo is managed by the Open Research Systems group, which is a division of Digital Initiatives and located in the Cambridge University Library. The University Library's Open Research teams are in charge of overseeing and selecting the data that may be found on Apollo. [8]

Chapter 3:

Methodology

3.1 Conceptual Framework

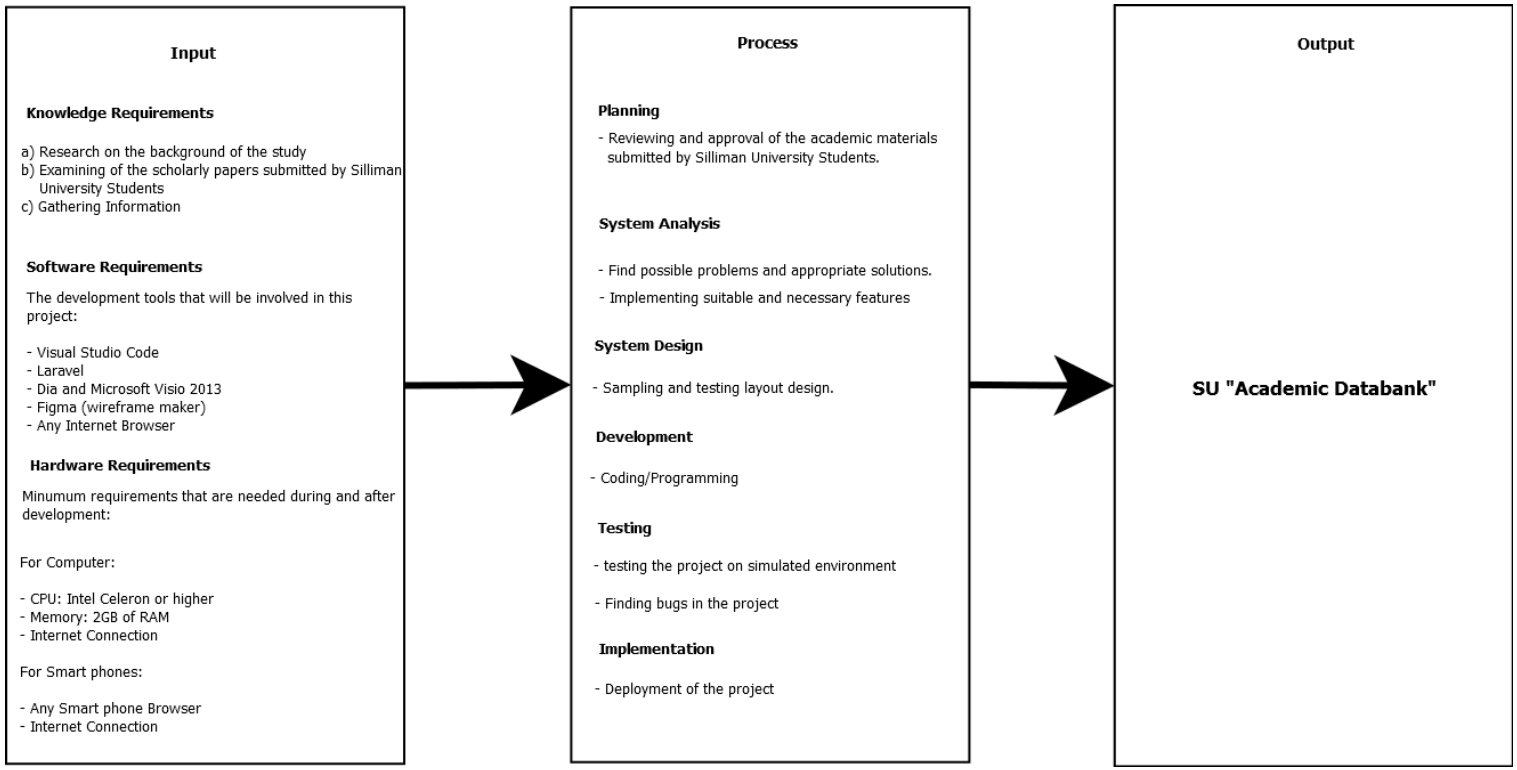


Figure 1. Conceptual Framework

3.2 List and Description of the Stakeholders of the System

Authors:

- Those who submitted their academic materials in the SU Academic Databank.

Users:

- The people who access the SU Academic Databank, which include Sillimanian students, Teachers and Faculty.

Clients:

- The people involved in the handling of the SU Academic Databank website app after development.

3.3 Software Development Model

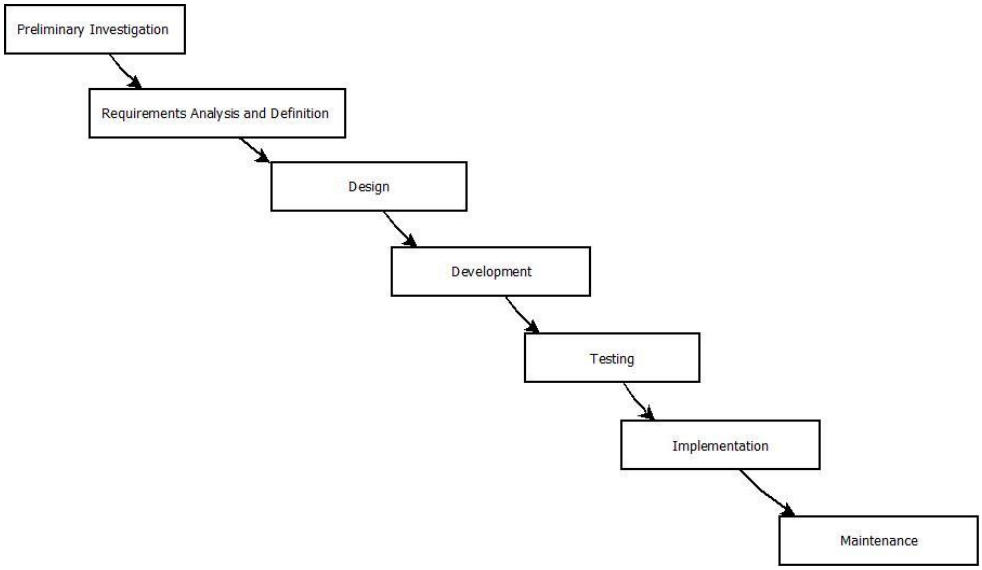


Figure 2. Waterfall Model

A Sequential model is shown by the waterfall model. The software development activity is separated into phases in this paradigm, and each phase consists of a succession of activities with various objectives. In waterfall development, one step begins only when the preceding phase is finished. Because of this, each step of the waterfall model is extremely precise and clearly defined. The waterfall model is so named because the phases descend from a higher level to a lower one, much like a waterfall.

The preliminary investigation determines the main functionalities that the SU Academic Databank requires. Requirement Analysis consists of capturing requirements and brainstorming to understand these requirements. Development and testing include designing and implementing different function models of the SU Academic Databank to the system and unit testing. The system will then be implemented to see if all requirements are met. Lastly, feedback will be received and the system shall proceed to maintenance.

3.4 Minimum Hardware and Software Requirements

Table 2. Minimum Hardware Requirements during Development

Monitor	13” Monitor or bigger with VGA
Microprocessor	Intel Celeron
RAM	2GB
Internet	Required

Table 3. Minimum Software Requirements during Development

Internet Browser	Any Browser will do
VS Code	Version 2019 or later
Google Firebase	Version 9
Laravel	Version 9
Dia or Microsoft Visio	Version 2014
Figma	Updated version in their website
uizard	Updated version in their website

Table 4. Minimum Hardware Requirements during Implementation

Monitor	13” Monitor or bigger with VGA
Microprocessor	Intel Celeron
RAM	2GB
Internet	Required

Table 5. Minimum Software Requirements during Implementation

Internet Browser	Any Browser will do
VS Code	Version 2019 or later
Google Firebase	Version 9
Laravel	Version 9
Dia or Microsoft Visio	Version 2014
Figma	Updated version in their website
uizard	Updated version in their website

3.5 Project Timeframe/Timeline/Schedule

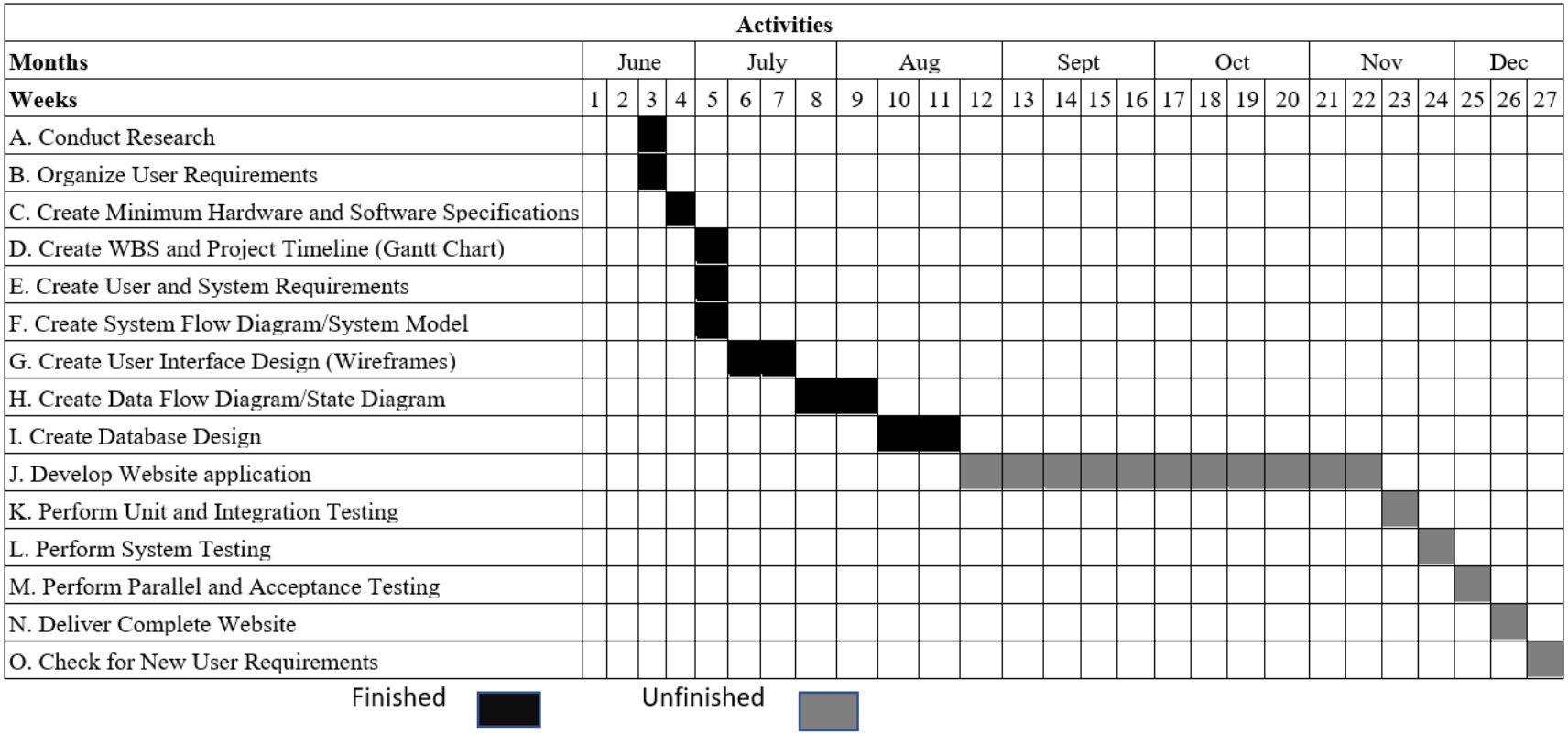
Table 6. Project Schedule

Main Activity	Activity ID	Specific Activity	Predecessor	Duration (Weeks)
Preliminary Investigation				
	A	Conduct Research	None	1
	B	Organize user requirements	None	1
Requirements Analysis				
	C	Create minimum hardware and software specifications	A,B	1
	D	Create WBS and Project Timeline (Gantt Chart)	C	1
	E	Create User and System Requirements	C	1
	F	Create System Flow Diagram/System Model	C	1
Design				
	G	Create User Interface Design (Wireframes)	D,E,F	2

	H	Create Data Flow Diagram/State Diagram	G	2
	I	Create Database Design	G,H	2
Development				
	J	Develop Website application	I	11
Testing				
	K	Perform Unit and Integration Testing	J	1
	L	Perform System Testing	K	1
	M	Perform Parallel and Acceptance Testing	L	1
Implementation				
	N	Deliver complete Website	M	1
Maintenance				
	O	Check for new user requirements	N	1

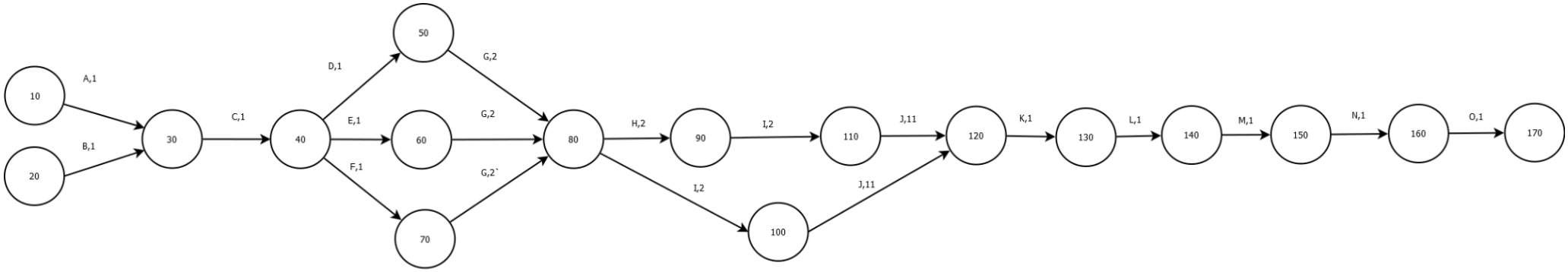
3.5.1 Gantt chart

Figure 3.Gantt Chart



3.5.2 Pert chart

Figure 4. Pert Chart



10,30,40,50,80,90,110,120,130,140,150,160,170 = 25 weeks (critical path)

10,30,40,50,80,100,120,130,140,150,160,170 = 23 weeks

3.6 Testing & Deployment Plan

Testers & Testing Process

Early different function modules of the SU Academic Databank shall be done in increments during the development by the developers of the web application. Once all modules have been tested and incorporated into the website application as a whole, initial testing of the system shall also be conducted by the development team. After initial testing for its functionality has been completed and passed, the developers and relevant parties will test the system and see if the system is up to user requirement specifications. Feedback is collected after the tests and maintenance of the system shall follow.

Testing Environment & Schedule

After the development of the website application, the testers may test the system wherever they are situated as the website application may be accessed anywhere online via the internet. The system will be estimated to be finished by the middle of November and testing will commence in the later weeks.

Test Goals

The most important goal of testing is to ensure that all bugs are fixed and the modules of the system are functioning as they should, on or before the dated schedule. Ensuring the quality of the system is also important in order to satisfy the needs of the client. Testing the system in stressful situations and unlikely scenarios also helps to find out how the system behaves in unusual circumstances and ensures the goal of having a stable and reliable system.

Chapter 4:

Analysis, Design & Development

4.1 Analysis

4.1.1 Work Breakdown Structure

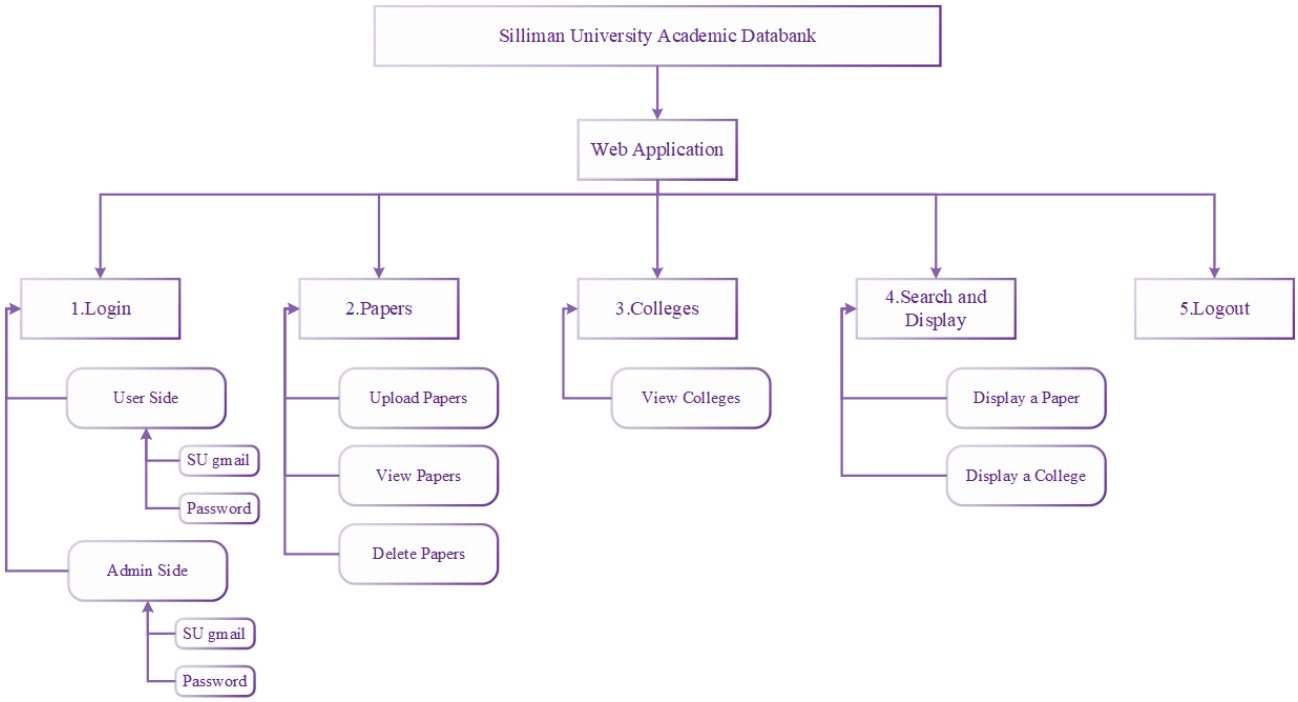


Figure 5. Work Breakdown Structure

4.1.2 Functional & Non-functional Requirements Analysis and Specifications

User Requirements

Functional Requirements:

UR1: The user shall be able to log in using their Silliman University Gmail account.

UR2: The user shall be able to search for academic works using keywords.

UR3: The user shall be able to filter searches according to research interest.

UR4: The user shall be able to view academic materials in full.

UR5: The user shall be able to get an automated citation of the specific paper.

UR6: The user shall be able to upload their academic materials to the databank.

UR7: The user shall be able to receive notifications about the reviewal and approval process of their uploaded academic materials.

UR8: The user shall be able to view feedback about submitted academic materials after the reviewal and approval process (If applicable).

UR9: The admin user shall be able to view submitted academic materials.

UR10: The admin user shall be able to review and approve submitted academic materials.

UR11: The admin user shall be able to give feedback during the reviewal and approval of submitted academic materials.

Non-functional Requirements:

URN1: The user shall be able to access the databank with a device that supports website browsers.

URN2: The user shall need an internet connection to access the databank.

URN3: The user shall be able to access the databank anytime as long as they are connected to a stable internet connection.

URN4: The user shall need a Silliman Gmail account to log into the databank.

System Requirements

Functional Requirements:

SR1: The website application shall allow the user to log in using their Silliman University Gmail account.

SR2: The website application shall allow the user to search for academic works using keywords.

SR3: The website application shall allow the user to filter searches according to research interest.

SR4: The website application shall be able to display the academic materials in full.

SR5: The website application shall be able to generate an automated citation of the specific paper.

SR6: The website application shall allow the user to upload their academic materials to the databank.

SR7: The website application shall be able to display notifications about the reviewal and approval process of the uploaded academic materials.

SR8: The website application shall allow the user to view feedback about submitted academic materials after the reviewal and approval process (If applicable).

SR9: The website application shall allow the admin user to view submitted academic materials.

SR10: The website application shall allow the admin user to review and approve submitted academic materials.

SR11: The website application shall allow the admin user to give feedback during the reviewal and approval of submitted academic materials.

Non-functional Requirements:

SRN1: The website application shall be able to run on a device that supports website browsers.

SRN2: The website application shall require the user to have an internet connection to access the databank.

SRN3: The website application shall be accessible to the user anytime.

SRN4: The website application shall require the user to have a Silliman Gmail account to log into the databank.

4.2 Design

4.2.1 Data Flow Diagram

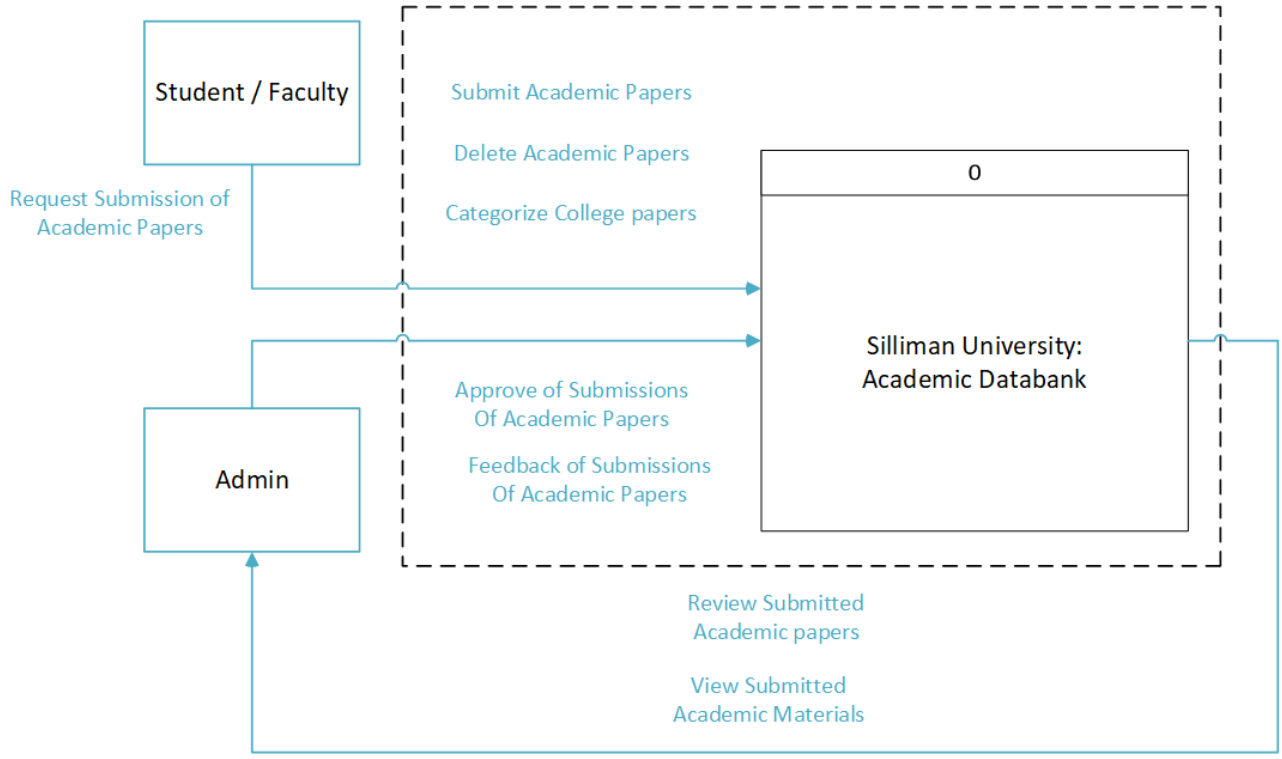


Figure 6. Data Flow Diagram

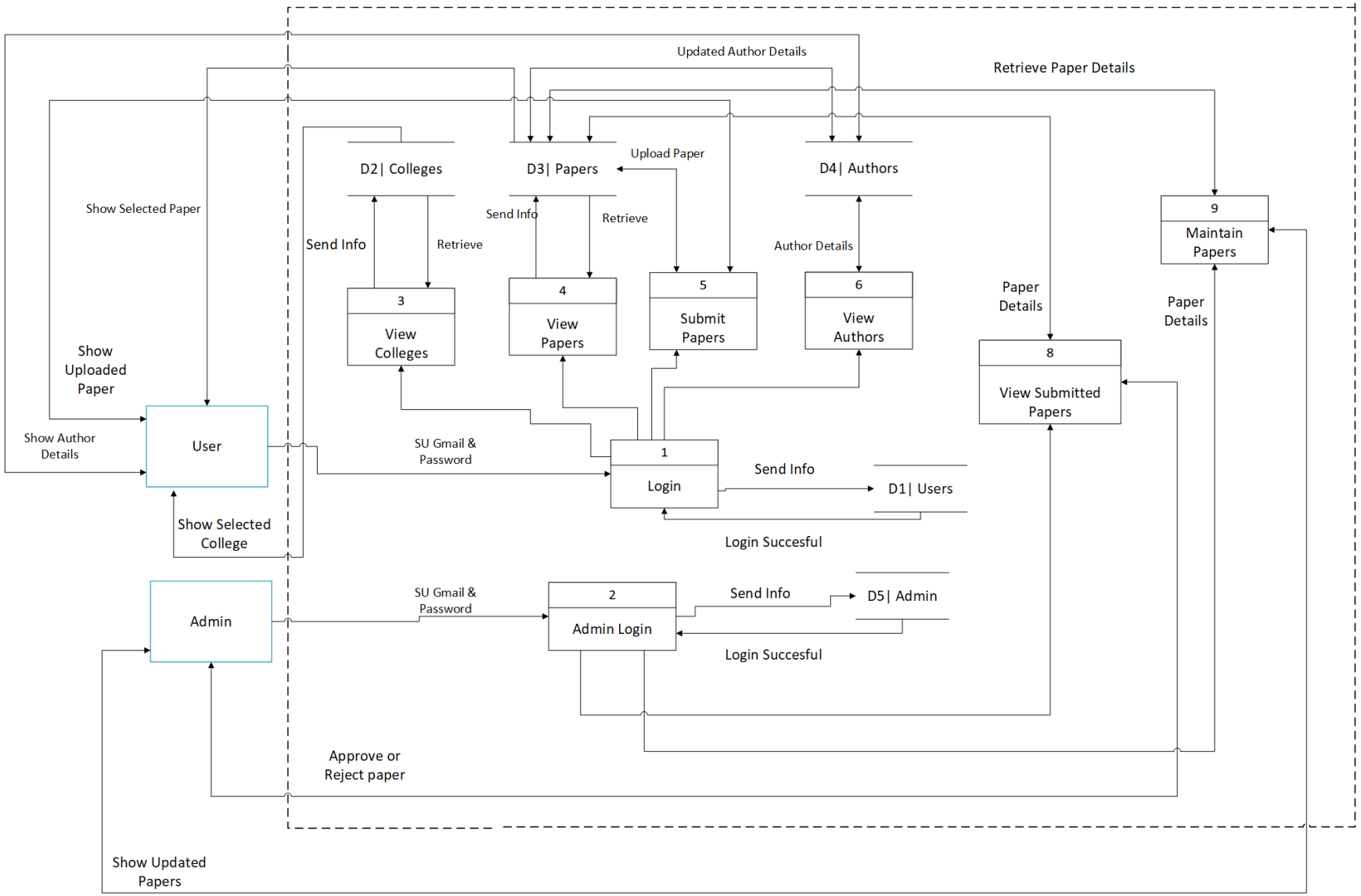


Figure 7. Top Level Diagram

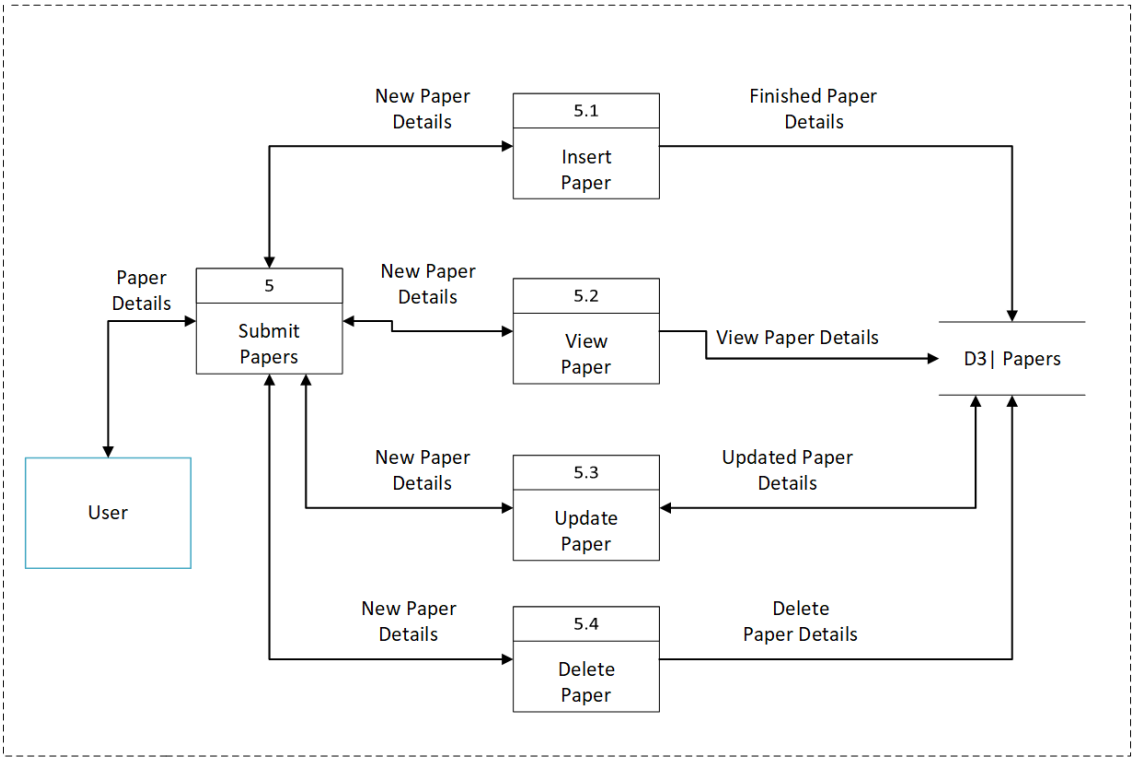


Figure 8. Process 1.0 Level of Explosion

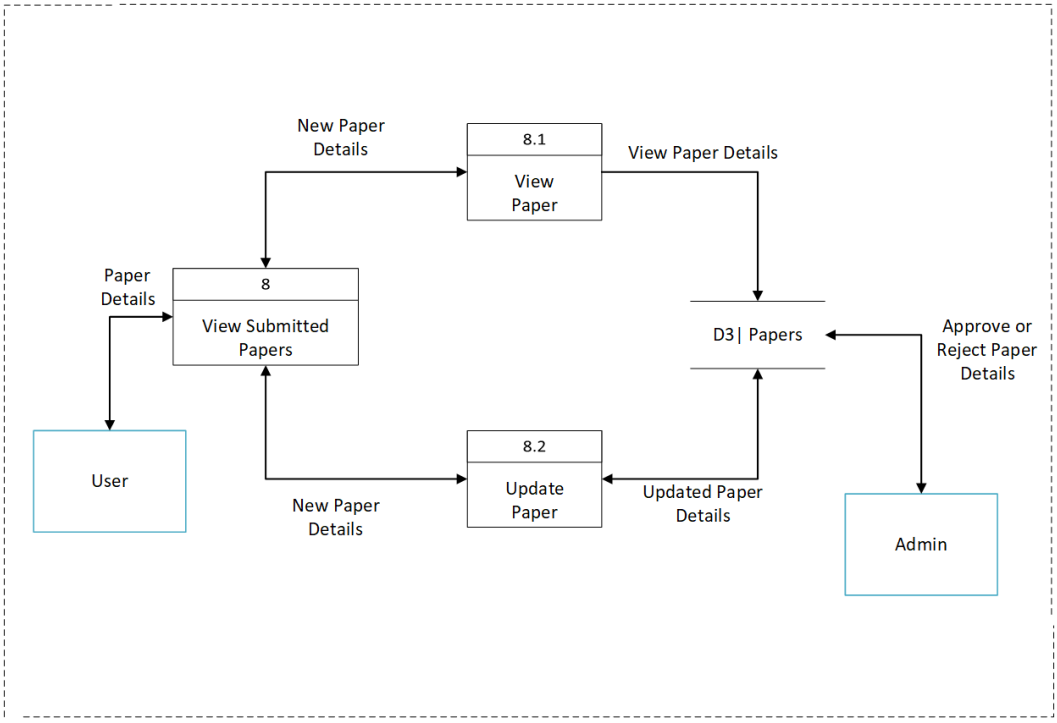


Figure 9. Process 2.0 Level of Explosion

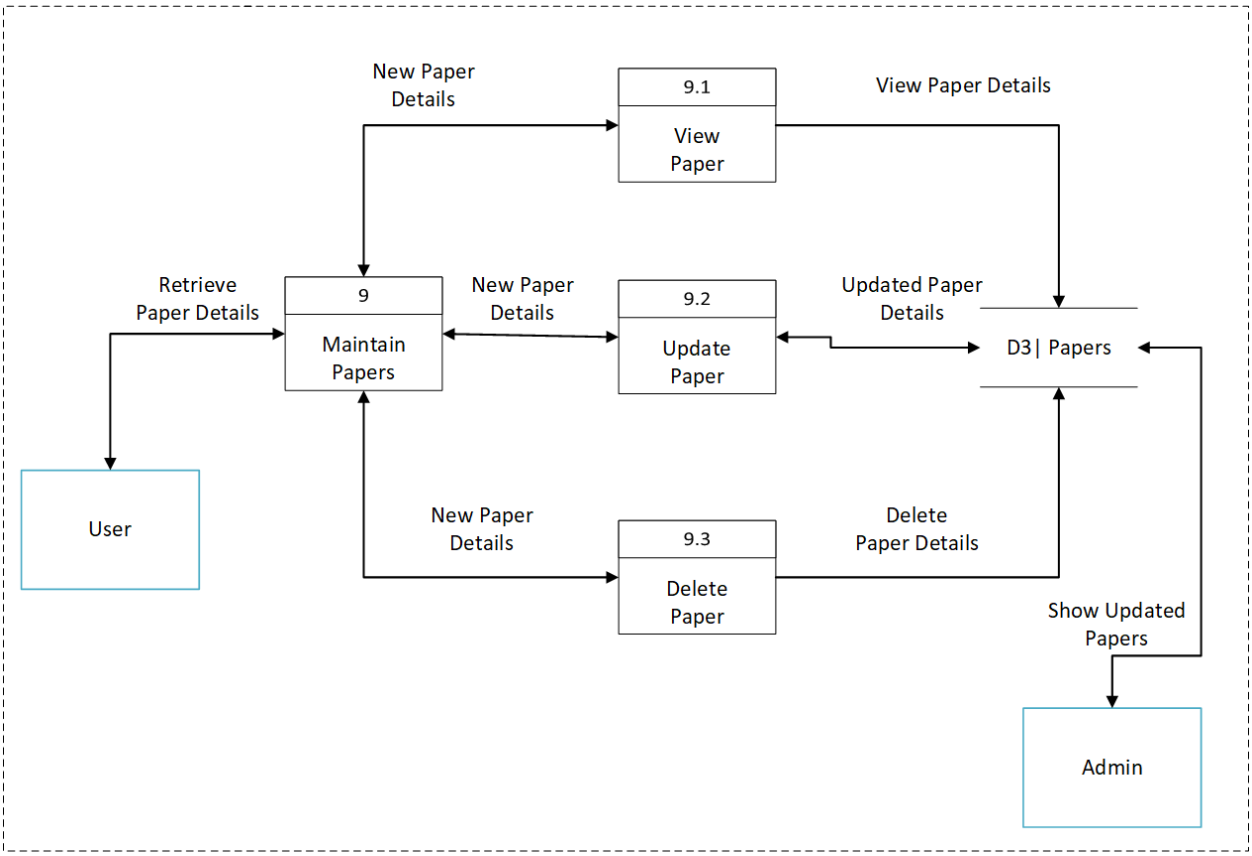


Figure 10. Process 3.0 Level of Explosion

4.2.2 The Database Design (If Applicable)

4.2.2.1 Conceptual Database Model/Diagram (e.g ERD)

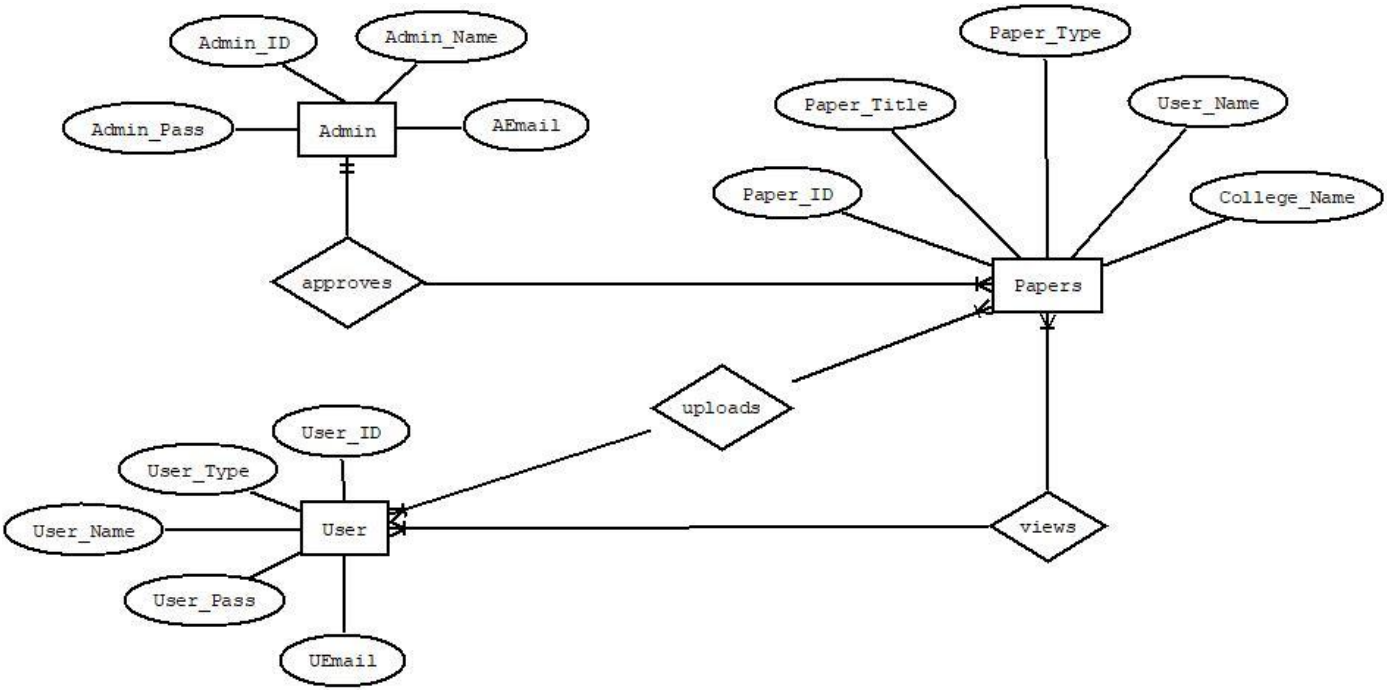


Figure 11. Entity Relationship Diagram

Business Rules

The following are the Business Rules that serve as the basis for the project's ERD:

1. Each Admin can add one or more papers
2. Each paper can be added by only one admin

3.An Admin can approve one or more papers
4.A paper can be approved by one Admin

5.A user can upload one or more papers
6.A paper can be uploaded by one or more users

7. A user can view one or more papers
8. A paper can be viewed by one or more users

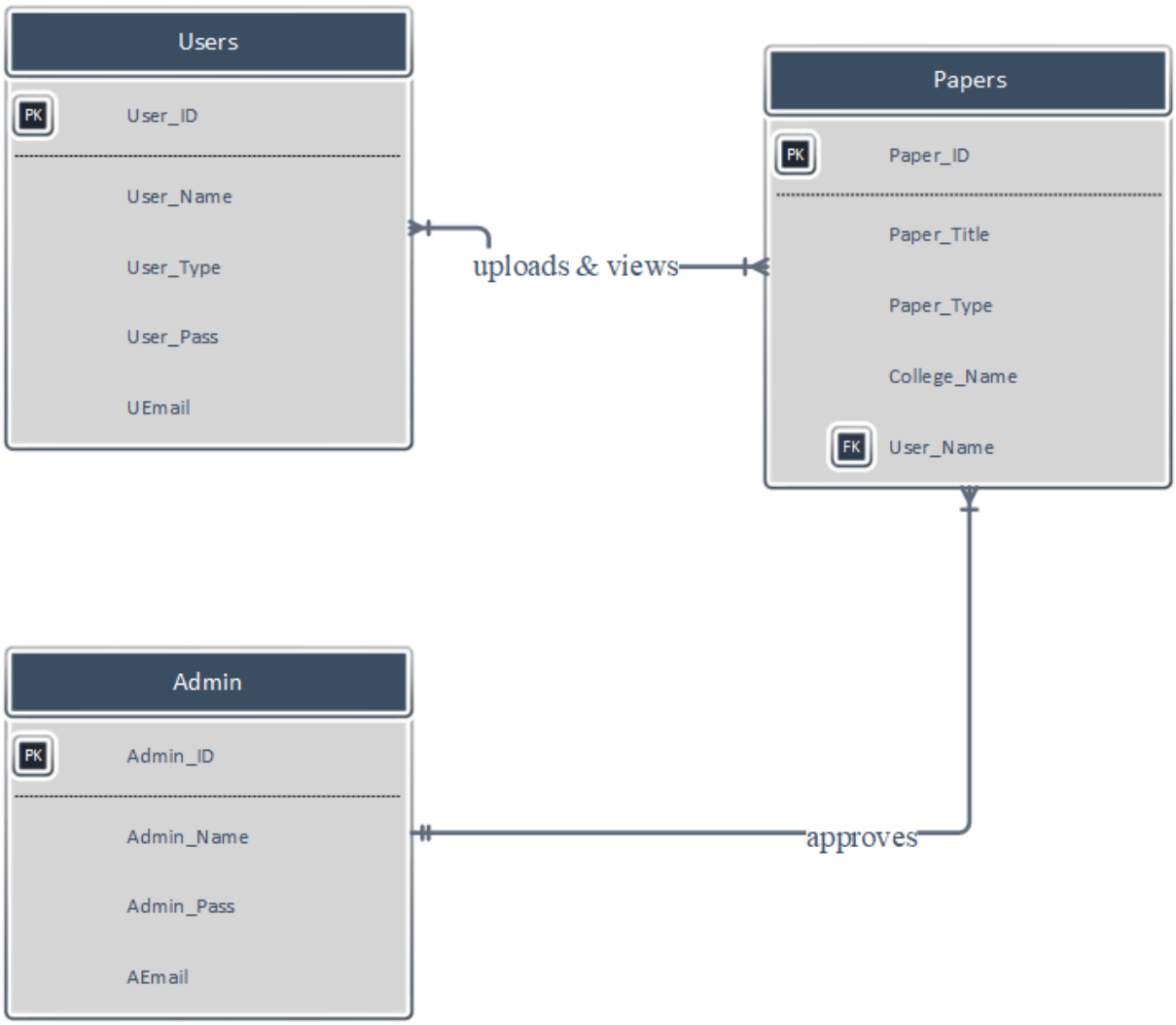


Figure 12. Conceptual Database Model

4.2.2.2 State Diagram

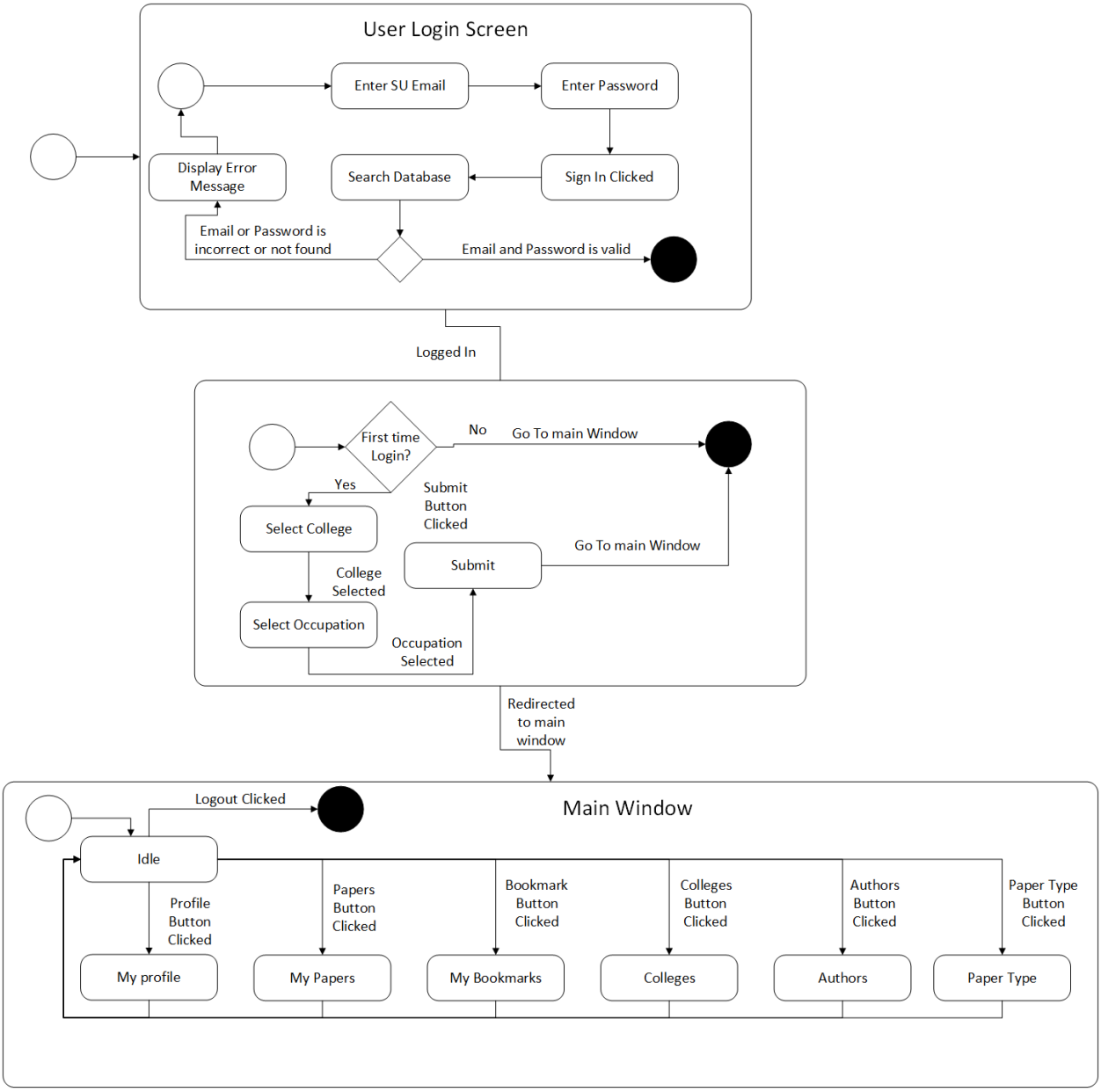


Figure 13. Login State Diagram

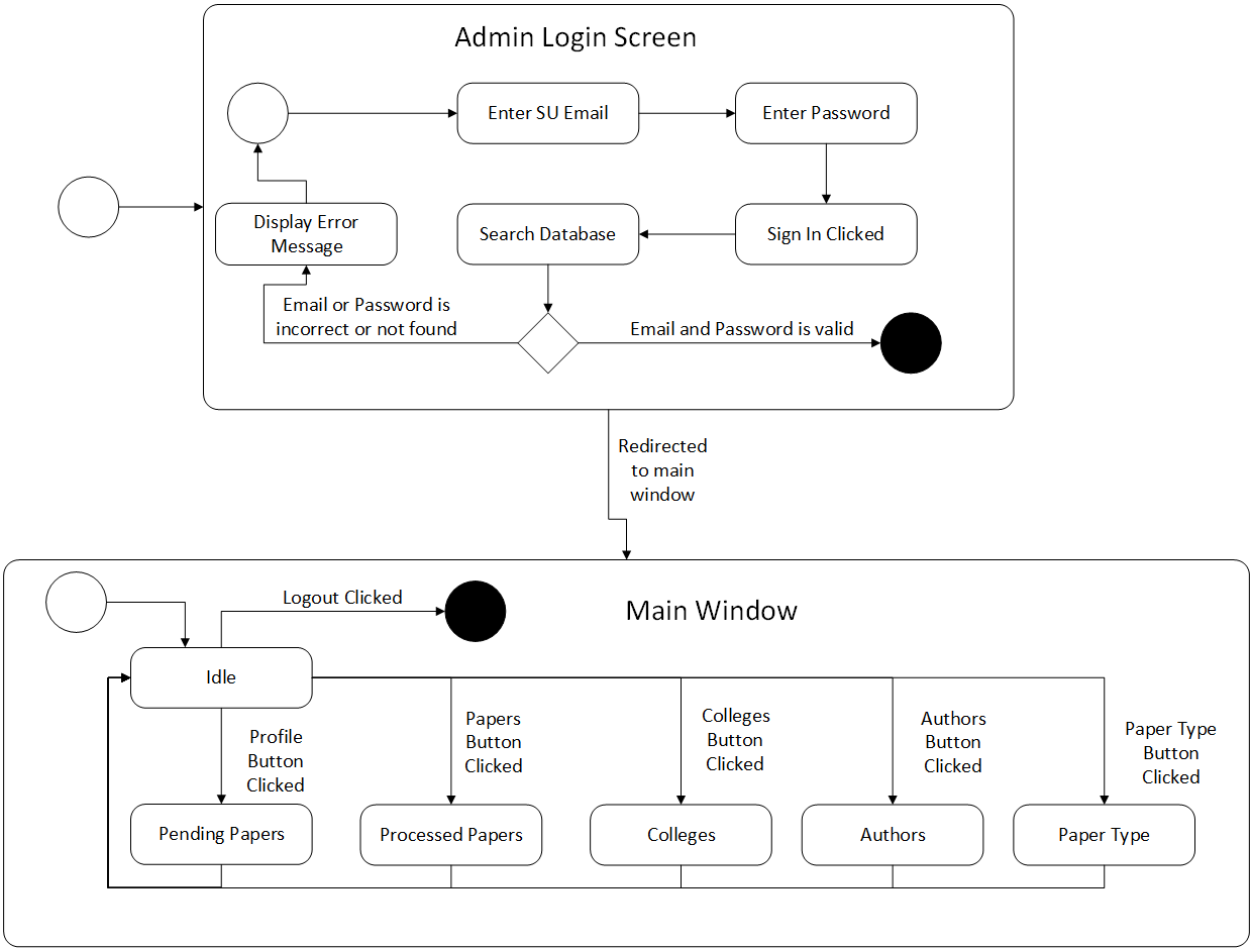


Figure 14. Admin Login State Diagram

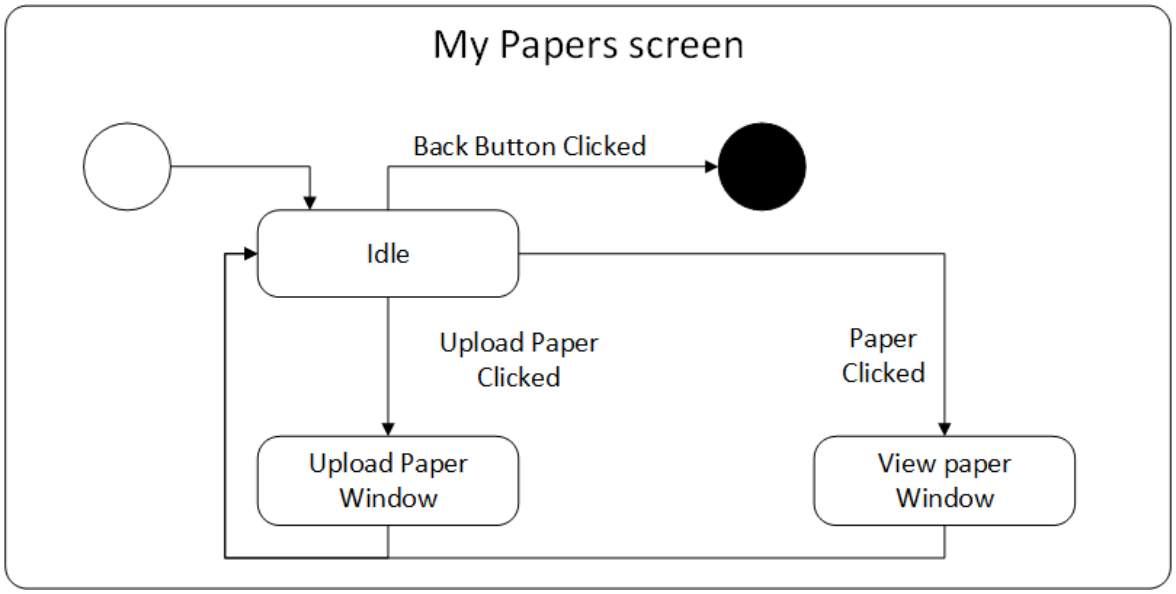


Figure 15. My Papers State Diagram

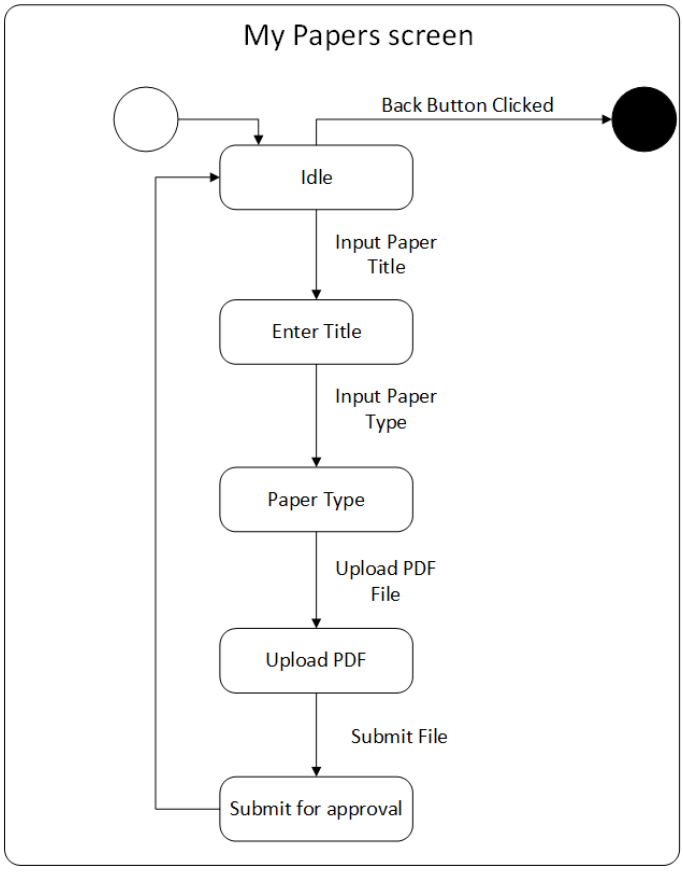


Figure 16. My Papers Explosion State Diagram

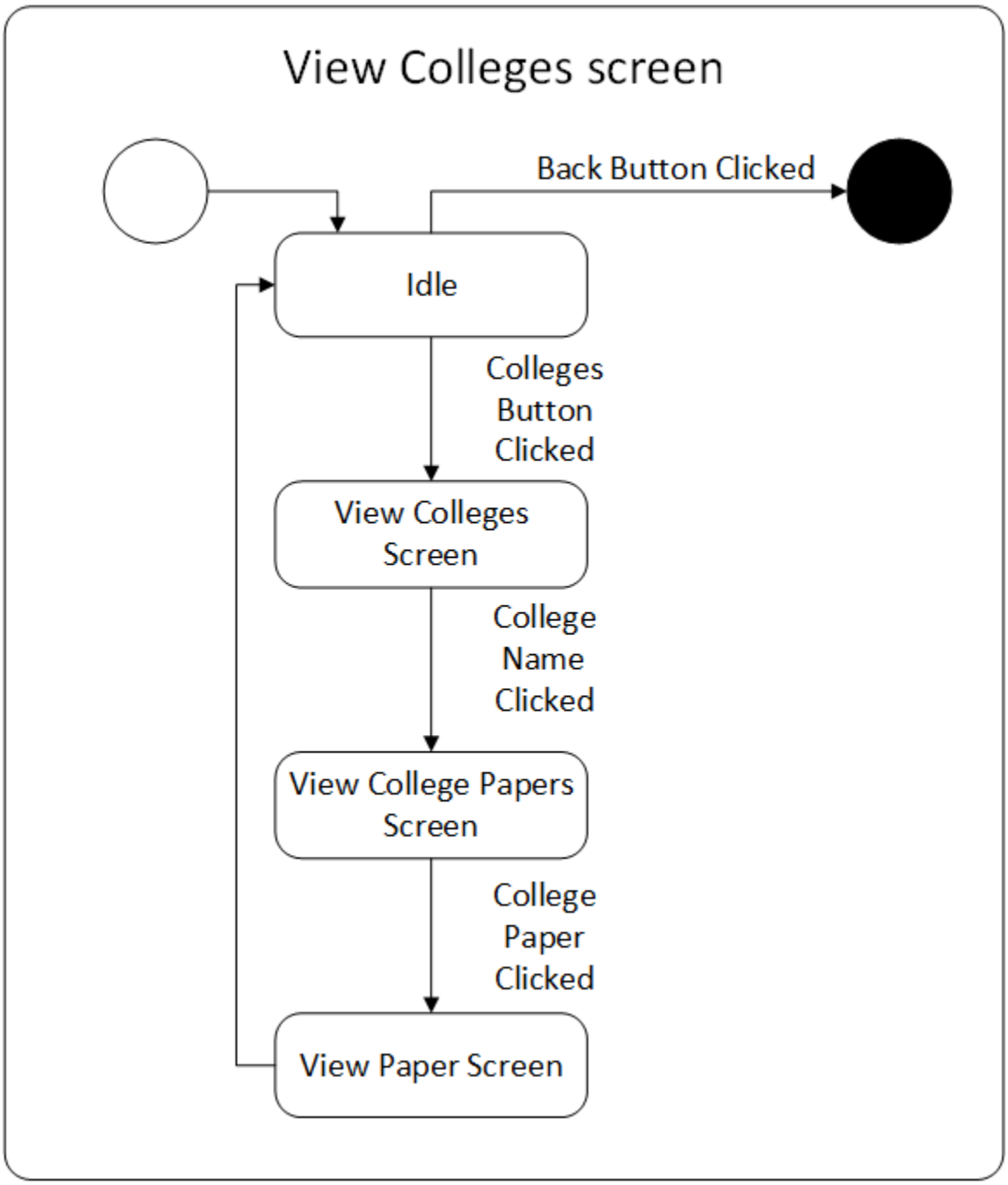


Figure 17. View Colleges State Diagram

4.2.2.3 Logical Database Model

4.2.2.3.1 Normalized Tables (3NF)

Table 7. Normalized Tables of the Databank

Users

User_ID	User_Type	User_Name	UEmail	UserPassword
00001	User	John Smith	smithjohn@su.edu.ph	Password
00002	User	Ben Salan	salanb@su.edu.ph	Pass1234word
00003	Admin	Collei Calista	CCalista@su.edu.ph	Pass###word

Papers

Paper_ID	Paper_Type	Paper_Title	College_Name	User_Name
00012	Capstone	AUXILIUM: A Mobile Application Management System for Boarding Houses	CCS	Therese Patrimonio
00013	Thesis	Three_Dimensional Geometric Image Analysis for Interventional Electrophysiology	PT	John E. McManigle Jr
00014	Thesis	A Quantitative Study of the Impact of Social Media Reviews on Brand Perception	MasCom	Neha Joshi

Admin

Admin_ID	Admin_Name	AEmail	Admin_Pass
00067	Deanne Agir	deannebagir@su.edu.ph	12345678Agir
00068	Renz Labiaga	renzlabiaga@su.edu.ph	ArjayLabs
00069	Kyle Estabillo	kyleestabillo@su.edu.ph	Kyle1234pass

4.2.2.4 Data Dictionary

Table 8. Data Dictionary of the Databank

	ATTRIBUTE NAME	CONTENTS	TYPE	FORMAT	RANGE	REQUIRED	PK/FK	VALID VALUES	DEFAULT VALUE	FK REFERENCE TABLE
Users	User_ID	The ID of the user	Integer (5)	##	1-99999	Y	PK			
	User_Type	The type of the user	Varchar (50)	A (50)	N/A	Y				
	UserName	The name of the user	Varchar (50)	A (50)	N/A	Y				
	UEmail	The email of the user	Varchar (50)	A (50)	N/A	Y				
	UserPassword	Password of the user	Varchar (20)	A (20)	N/A	Y				

	ATTRIBUTE NAME	CONTENTS	TYPE	FORMAT	RANGE	REQUIRED	PK/FK	VALID VALUES	DEFAULT VALUE	FK REFERENCE TABLE
Papers	Paper_ID	The ID of the user	Integer (5)	##	1-99999	Y	PK			
	Paper_Type	The type of the user	Varchar (50)	A (50)	N/A	Y				
	Paper_Title	The name of the user	Varchar (50)	A (50)	N/A	Y				
	College_Name	The email of the user	Varchar (50)	A (50)	N/A	Y				
	User_Name	The name of the user that will be used as an author	Varchar (50)	A (50)	N/A	Y	FK			Users

	ATTRIBUTE NAME	CONTENTS	TYPE	FORMAT	RANGE	REQUIRED	PK/FK	VALID VALUES	DEFAULT VALUE	FK REFERENCE TABLE
Admin	Admin_ID	The ID of the admin	Integer (5)	##	1-99999	Y	PK			
	Admin_Name	The name of the admin	Varchar (50)	A (50)	N/A	Y				
	AEmail	The email of the admin	Varchar (50)	A (50)	N/A	Y				
	Admin_Pass	Password of the admin	Varchar (20)	A (20)	N/A	Y				

4.2.3 Screen Layouts

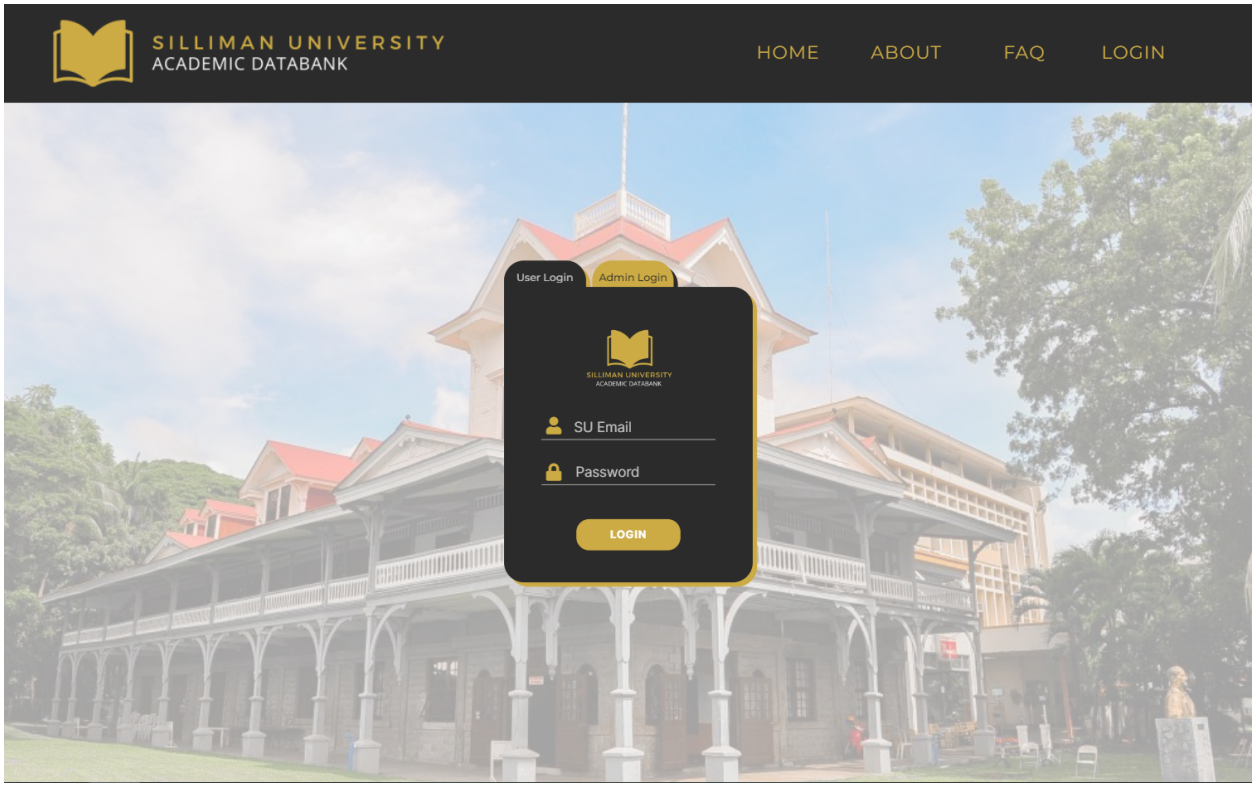


Figure 18. The login screen of Silliman University Academic Databank

The first screen that will appear when the website is loaded is the login screen. There will be a separate tab for user logins and admin logins. Both users and admins must input their SU Gmail account and default password in order to login. Once the correct credentials are inputted and the login button is clicked, they will be directed to the home screen of the website.

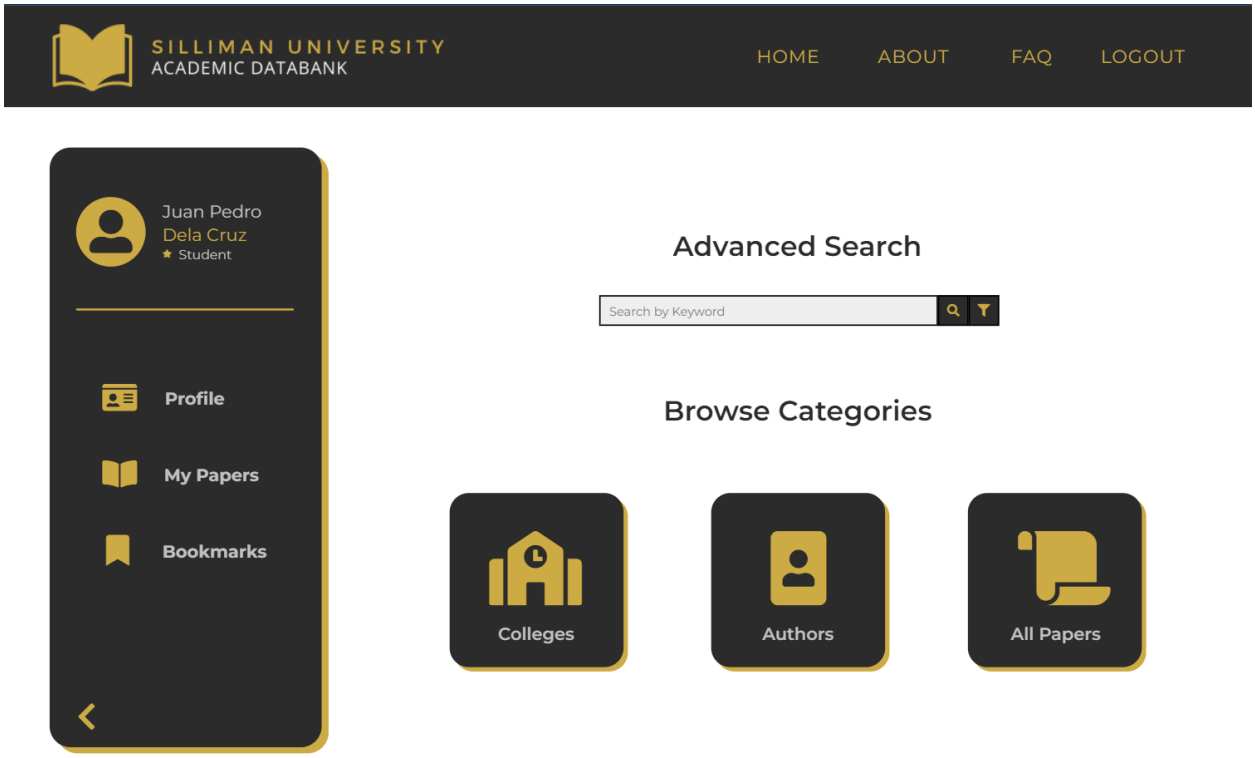


Figure 19. The home screen of the Silliman University Academic Databank

After login, users will be directed to the home screen of the website. Here, users are able to utilize the search function of the website. Users may use the search bar to type in specific keywords of papers and use the filter option to narrow down search results further. Users may also browse papers according to different organized categories.

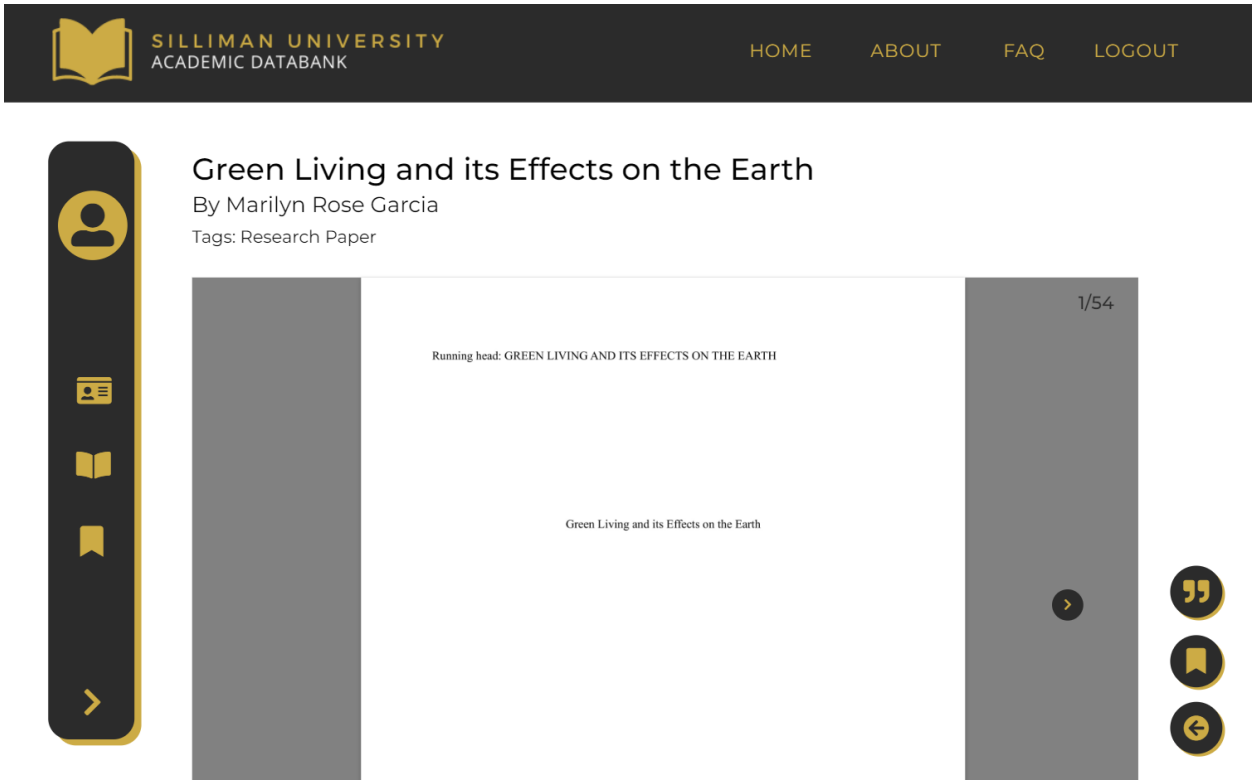


Figure 20. Paper viewing screen of the Silliman university Academic Databank

After choosing a paper to view, the paper viewing screen will load and users will be able to view the pages of the paper. The papers are all images and cannot be copy-pasted. The papers are also non-downloadable, however, users may bookmark specific papers by clicking the bookmark button on the lower left and view the papers in their bookmarks tab for faster access. Users may also click the quotation button on the bottom left to automatically generate citations should they retrieve information from the specific paper for their own work.

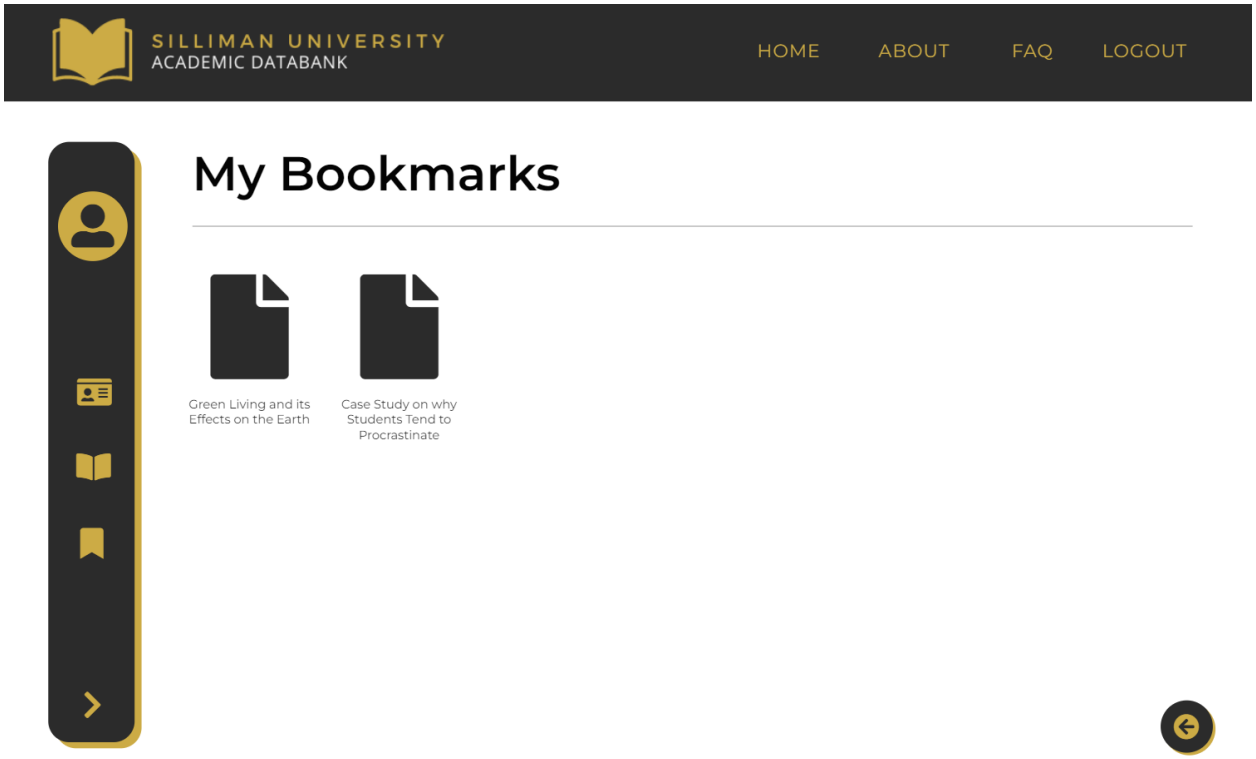


Figure 21. My Bookmarks Screen of the Silliman university Academic Databank

Although the papers will be non-downloadable, users may still bookmark papers and they will show up on the bookmarks page. Users can also un-bookmark papers they do not wish to see in their bookmarks tab.

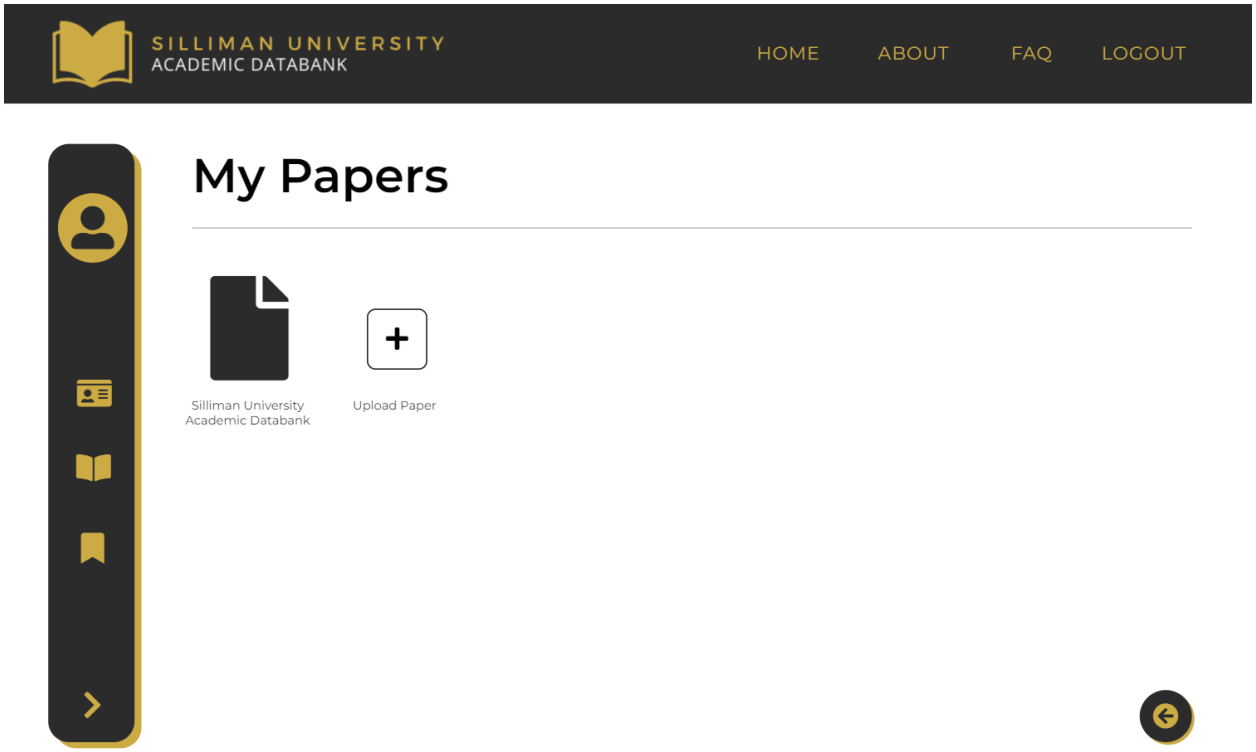


Figure 22. My Papers screen of the Silliman University Academic Databank

In this screen, users will be able to view papers they have successfully published. When users select one of the papers, the paper viewing screen will load. In addition to that, they will be able to upload papers from this tab as well. After clicking the "Upload Paper" button, the users will be directed to the upload paper screen.

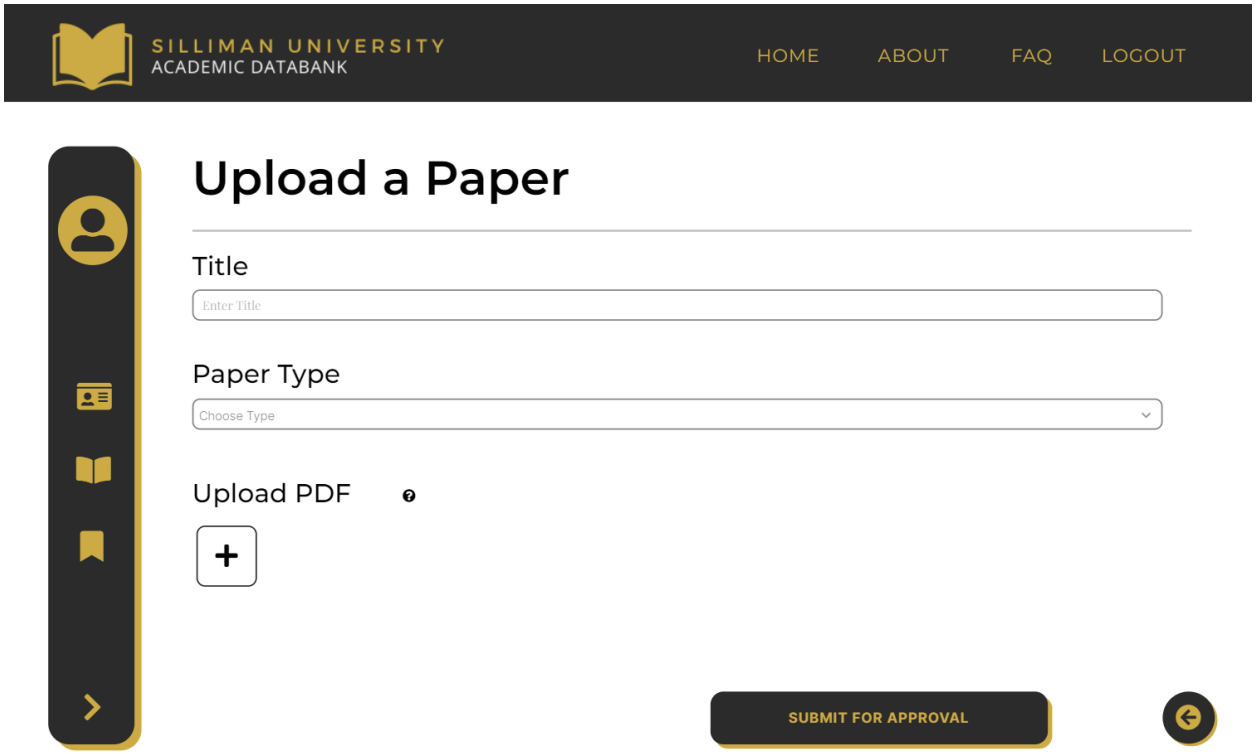


Figure 23. Upload paper screen of Silliman University Academic Databank

In order to upload a paper, users must input the title and choose the appropriate paper type from the drop-down box. Before uploading the paper, users are required to convert their relevant documents into an image format (.jpg or .png). Detailed instructions will be provided in the FAQ section of the website. After all the steps are done correctly, users may click the "Submit for Approval" button to submit their papers.

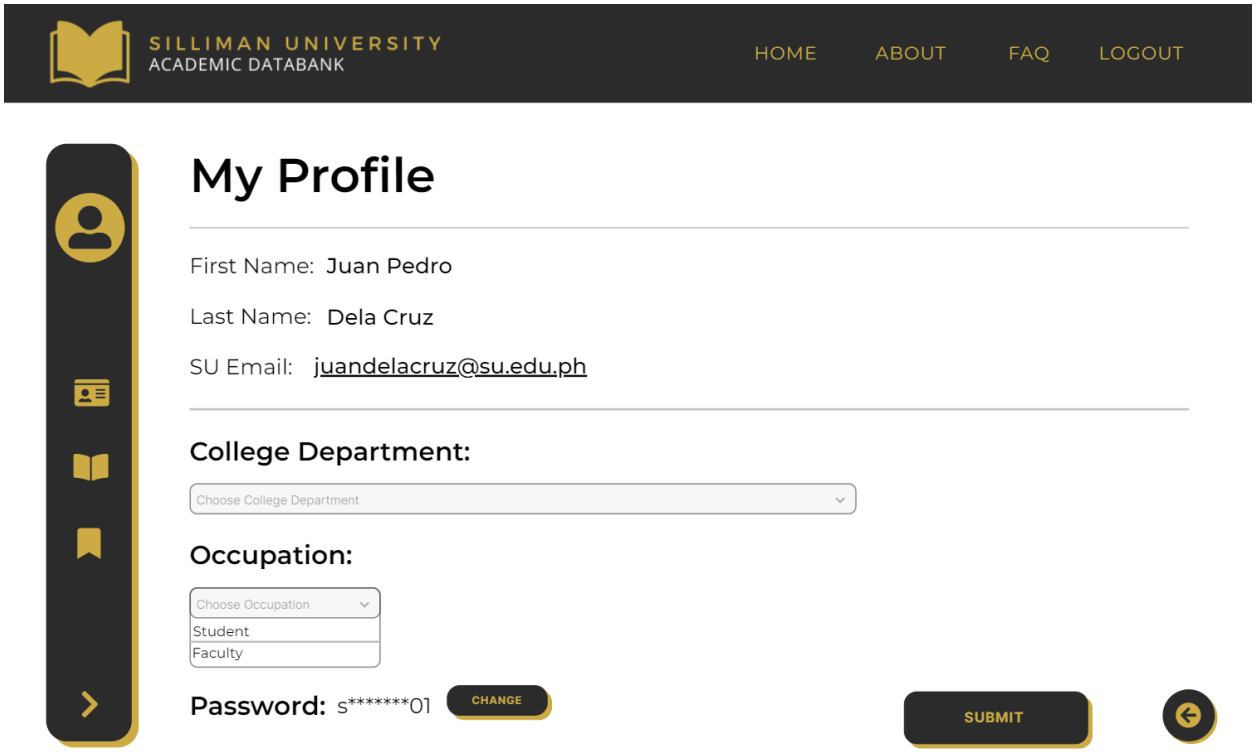


Figure 24. User Profile screen of Silliman University Academic Databank

Upon the first login of the user on the website, they are required to choose their respective college department and occupation from the drop boxes. Users must fill this up carefully and correctly as it cannot be changed later on after pressing "Submit" unless they contact an admin. Users may also change their passwords if they wish to do so. They may change this any time.

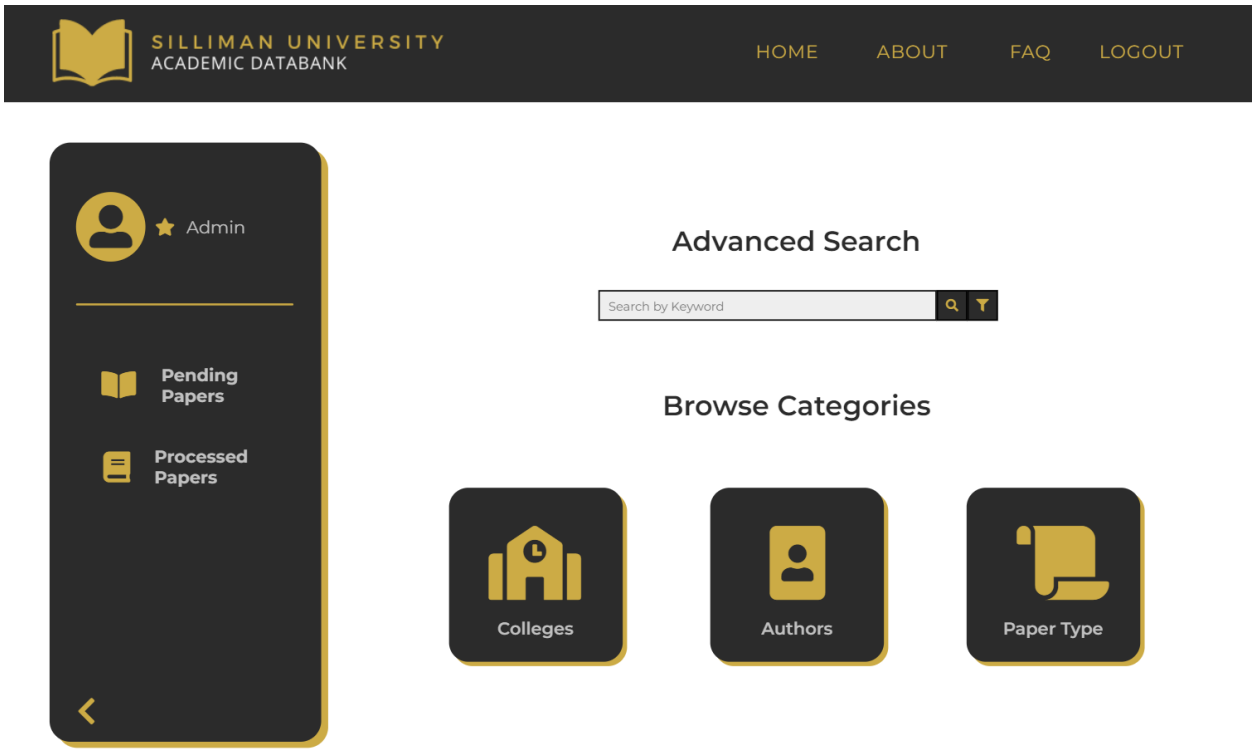


Figure 25. Admin Home Screen of the Silliman University Academic Databank

Instead of the "Profile" tab, "My Paper's" tab, and "Bookmarks" tab, admins will have "Pending Papers" tab and "Processed Papers" tab. Admins may also search papers the same way a user would, but cannot bookmark papers.

Figure 26. Pending Papers screen of the Silliman University Academic Databank

On the pending papers screen, admins can see user's submitted papers for review and approval before publishing. Upon selecting a paper, the admin will be directed to the "Review and Approval" screen.

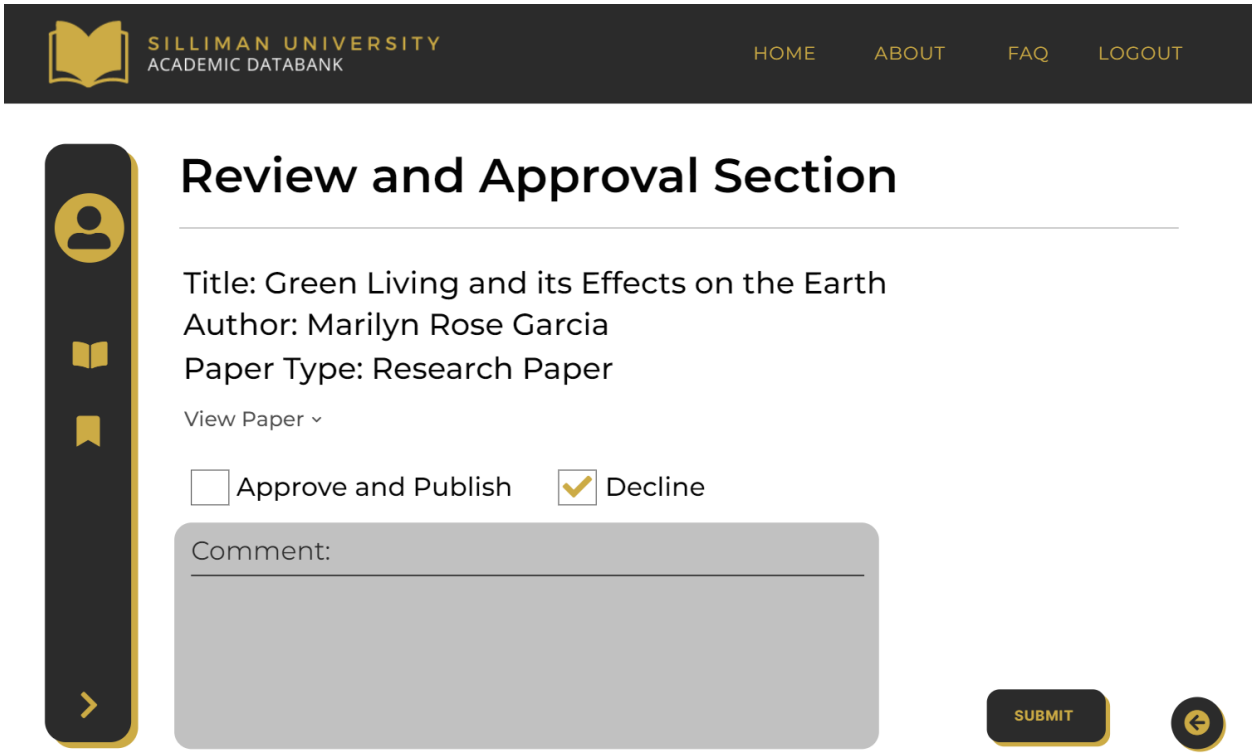


Figure 27. Review and Approval screen of the Silliman University Academic Databank

On this screen, admins will be able to view papers and review them before it is published publicly on the Silliman University Academic Databank. When the "Approve and Publish" box is checked and the submit button is clicked, an email will be sent to the author to notify them that their paper has passed the reviewal and approval process and has been published. Approved papers will be published in their appropriate categories and students will be able to search and view them. If the paper is not appropriate for publishing, the admin may give a comment after checking the decline box specifying why the paper was declined and then click the submit button to send an email to the author that contains the written comments about their paper and to notify them about the unsuccessful attempt to publish their paper.

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