PeakOne: Enabling Remote Access to UPLB ICS Technical Reports

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***Abstract*— Conducting research on previous studies have been limited to physical libraries. PeakOne was created to augment the research process by providing a convenient way of accessing resources within the UPLB ICS. The service allows researchers to remotely view research papers that may be relevant to their study and also aid by providing ways to save resources for later viewing and displaying research that they have read before. Current users found the service to be usable and would recommend its use to their peers.**

***Index Terms*— online repository, web application, python, remote access**

I. Introduction

A. Background of the Study

At the height of the COVID-19 pandemic, establishments worldwide were closed in order to minimize the spread of the virus. This includes schools and universities. During this time, accessing research materials within the university became difficult. Although there are many online resources, access to relevant and local materials is essential in research.

In UP, online resources, such as UP Integrated Library System or iLib [1] [2], and UPLB University Library's University Knowledge Digital Repository [3], are in place to serve as a starting point to conducting research. However, due to the number of services and resources that are available in these platforms, looking for specific materials can be tedious.

PeakOne aims to simplify the search process for technical research papers conducted and submitted in UPLB ICS by providing a clean and simple web application that primarily serves Thesis and Special Problems (SPs) accomplished by ICS students and researchers.

B. Statement of the Problem

In conducting new studies, researchers must diligently consider existing literature to avoid redundant efforts and build upon the challenges and recommendations from previous research. With the COVID-19 pandemic and the New Normal mode of learning, online classes have been implemented across different levels of education. Remote access to digital educational resources, including research materials, has become essential. However, looking up previous thesis and SPs can only be done by going to the physical library, lacking a convenient remote access option.

Moreover, the upkeep of physical libraries entails substantial maintenance efforts, whereas digital storage offers enhanced efficiency in searching and organizing information. Additionally, digital repositories enable the storage of vast amounts of data within a smaller physical footprint. With this, PeakOne was created as an online platform to serve UPLB ICS SPs and Thesis to researchers and to improve the quality of life of the repository's maintainers.

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C. Significance of the Study

The study introduces a web application that allows remote access to UPLB ICS technical research reports. It emphasizes user-friendly interfaces for efficient searching and management of theses and SPs within UPLB ICS. The application, developed using Python/Flask, ensures easy maintenance and benefits both researchers and ICS administrators/staff by improving access to previous studies and streamlining the management of current and future research papers.

D. Objectives

The main objective of this study is to create a web-based platform that enables remote access to technical research papers of the University of the Philippines Los Baños Institute of Computer Science. Its specific objectives include:

1) provide an online and accessible service to look up studies conducted in the UPLB ICS;
2) create an interface for students to submit their SPs and Thesis; and
3) allow ICS faculty members and admin staff to manage and keep track of existing research papers.

E. Scope and Limitations

The study aims to develop a web application for convenient online access to SP and Thesis materials for ICS students, alumni, and faculty members.

II. Research Related Literature

A. Open Public Access Catalog (OPAC)

An OPAC, or Online Public Access Catalog, is an online database or catalog that enables users to search and access resources within a library's collection [4] [5]. It serves as a virtual interface for users to discover and locate books, journals, audiovisual materials, and other resources available in the library. OPACs provide search functionality that allows users to search for items based on various criteria such as title, author, subject, or keyword. The search results display information about the availability, location, and other details

of the items. Examples of OPACs include Koha [6] [7], Voyager, Alma, WorldCat Discovery, and Symphony, which are widely used by libraries and institutions worldwide to facilitate efficient access to their collections and enhance the user experience.

B. Digitization

Digital repositories play a crucial role in managing and preserving digital content, offering several important benefits. Firstly, they provide secure storage and backup systems, ensuring the safety and integrity of digital materials over time. Digital repositories also facilitate long-term access and discoverability of resources [8], enabling users to search, retrieve, and explore digital content efficiently. They contribute to the preservation of cultural heritage [9], scholarly publications, research data, and other valuable digital assets. Examples of prominent digital repositories include DSpace [10] [11], which is widely used by academic institutions and research centers, and the Digital Public Library of America (DPLA), which aggregates and provides access to digital collections from libraries, archives, and museums across the United States. Additionally, disciplinary repositories such as arXiv [12] for scientific research papers, PubMed Central [13] for biomedical literature, and the Data Repository of the University of California (Dash) [14] for research data exemplify the importance of specialized repositories in specific fields. These repositories serve as vital infrastructures for preserving and sharing digital resources, fostering collaboration, and advancing knowledge in diverse domains.

C. The UP iLib

The UP iLib [1] [2], also known as the UP Integrated Library System, is an online platform and system used by the University of the Philippines (UP) to manage and provide access to various library resources. It serves as a centralized platform for UP students, faculty, and researchers to search for and access a wide range of academic materials, including books, journals, articles, theses, and other scholarly works. The UP iLib offers a comprehensive collection of digital and physical resources, enabling users to conduct research, borrow materials, and engage in academic pursuits efficiently.

D. UPLB University Library

The UPLB University Library has a number of services that provides an online interface to their catalog of resources. An example is the UPLB University Library University Knowledge Digital Repository (UKDR) [3] that serves select research and scholarly output which , along with the UPLB University Library Koha [7], allows researchers to lookup articles and research papers available in the UPLB University Library.

E. Google Scholar

Google Scholar [15] is a web-based search engine developed by Google that specializes in searching for scholarly literature. It provides access to a vast collection of academic resources, including articles, papers, theses, books, and conference proceedings. With its wide coverage across various disciplines and sources, Google Scholar enables researchers, students, and academics to discover and access scholarly information. Despite this, Google Scholar still lacks comprehensive content coverage [16]. PeakOne aims to provide the same discoverability and access to UPLB ICS academic resources.

F. Access Control

Access control, as outlined in RFC 4949, the Internet Security Glossary [17], is a regulated process that governs the utilization of system resources based on security policies, allowing access solely to authorized entities such as users, programs, processes, or other systems. It serves as a critical component of computer security, preventing unauthorized users from accessing system resources while permitting access to the appropriate individuals. Access control encompasses three key elements: authentication, authorization, and auditing.

1) Authentication: involves verifying the identity of an individual, device, or entity attempting to access system resources.

2) Authorization: entails providing access or permission to a user or entity for a specific purpose, enabling them to access system resources.

PeakOne will be utilizing the UP Mail service [18] through Google Oauth API [19] to allow current and future UP Mail account holders access to the resources.

III. Materials and Methods

A. Development Tools

The system was developed on a machine with the following specifications:

- OS: Windows 11 Pro 64-bit
- CPU: Intel Core i7-1065G7
- RAM: 16 GB LPDDR4x

The following software development tools and technology stack were used for the development of the system:

1) Environment
   - Visual Studio Code
   - Windows Susbsystem for Linux (WSL)
2) Technologies
   - Python 3
   - Flask
   - SQLite 3
   - Google OAuth API

B. Database Schema

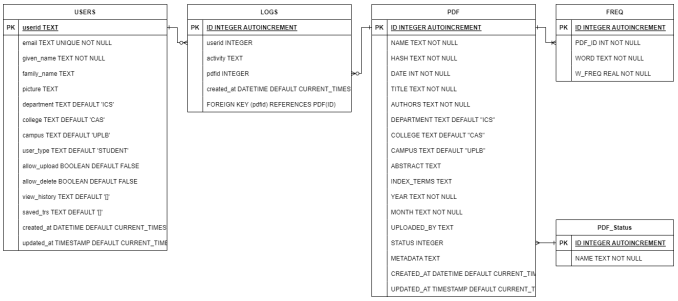

Fig. 1: Database Schema

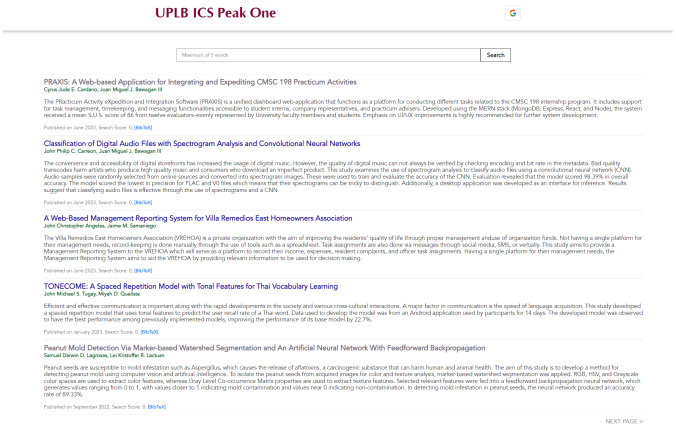

Fig. 2: Home Page

C. System Features

1) User Features:

- OPAC
  Users may lookup technical research paper available in the UPLB ICS collection.
- Search
  Users can use search terms to look for relevant resources.
- Submit Research Paper
  Users are able to submit their research conducted in the ICS.
- Favorites
  Users can save a research to easily find it in the future.
- View History
  When a user opens a research paper, it is recorded in the user's view history to allow for easier tracking of research process.
- User Authentication
  This security feature allows the system administrators to manage access to the resources.

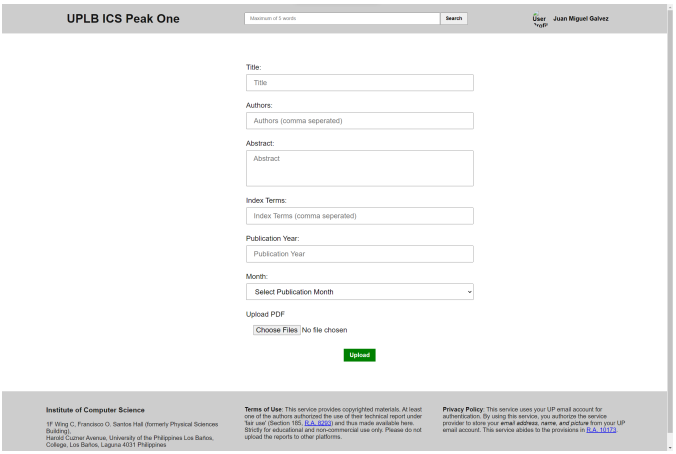

Fig. 3: Upload Page

2) Admin Feature:

- Change User Permissions
  Admin users are able to change user classification which determines a user's site privileges.
- Approve Research Paper
  Admin users can approve a research paper to be available to other users.
- Remove Research Paper
  Admin users may prevent a research paper from being displayed.
- Update Research Paper
  Admin users can edit the details of the research paper.

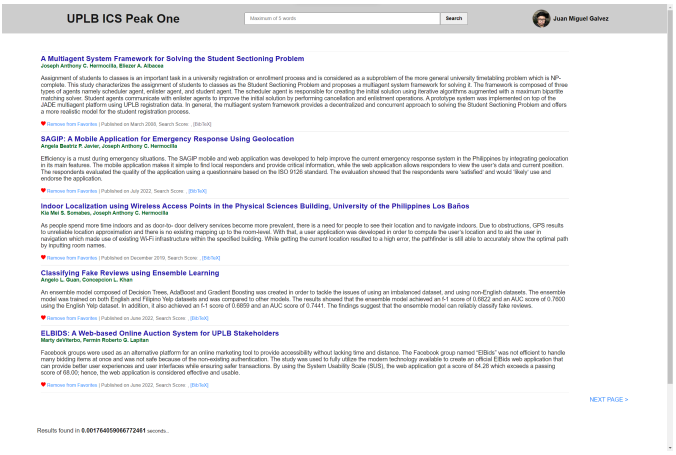

Fig. 4: Favorites Page

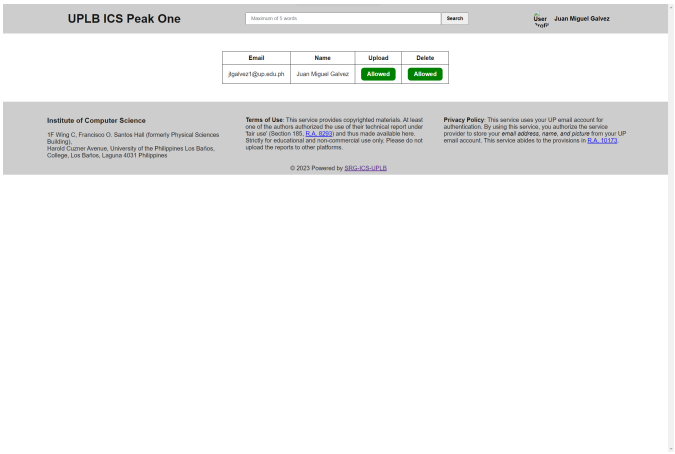

Fig. 5: Admin Page

D. Database Migration

There have been multiple version of the service. Changes in the system also necessitates changes in the database. For every iteration, a python script was created to allow easy transition between the previous and current database.

IV. Results and Discussion

The service has been deployed in ICS servers and is available through https://lib.ics.uplb.edu.ph. As of 27 July 2023, 174 users registered to the service and it contains 59 research papers.

A survey was sent out via Google Forms to the registered users. The survey received a total of 34 responses. Of the 34 respondents, 24 are current ICS students, five are ICS faculty members, three are ICS alumni, one is a UPLB alumni, and the last one is an ICS admin staff.

The survey asks the respondents to rate how easy it is to perform a certain tasks on a scale of 1 to 5, from difficult to easy. It consists of the following questions:

1) How easy is it to login using your UP Mail account?
2) How easy was looking up relevant research papers?
3) Is it easy to add to your favorite research papers?
4) Do you consider it easy to look for previously viewed research papers?

In addition, the survey asks for feedback or comments, and a feature the respondent would like to see added to the service. The respondents also rated on how useful the service is to their research process and if they will recommend it to their peers.

Most of the respondents did not have any difficulty logging in with their UP Mail account.

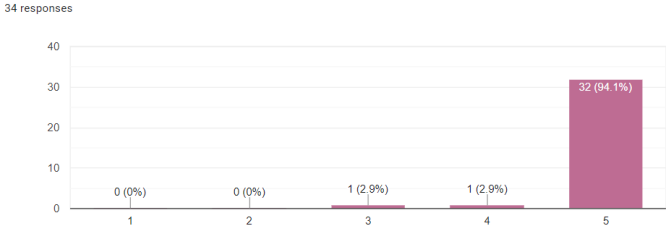

Fig. 6: How easy is it to login using your UP Mail account?

Twenty-three (23) of the thirty-four (34) respondents, said looking up research papers were on the easier side. While eight (8) of them were neutral on this. The remainder found it difficult to look up relevant research papers.

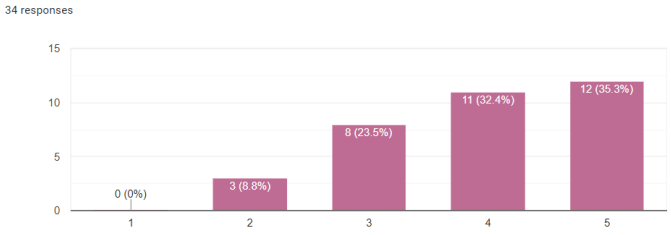

Fig. 7: How easy was looking up relevant research papers?

Of the 34 respondents, thirteen (13) found it extremely easy to add research papers to their favorites. However, three of the respondents noted in the comments that finding the favorites button was difficult.

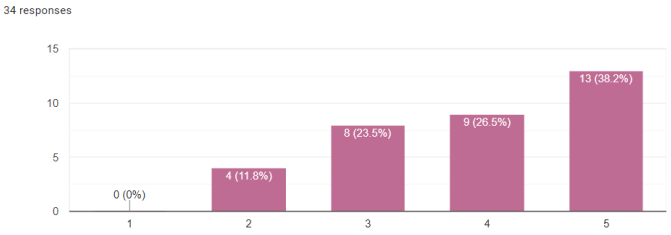

Fig. 8: Is it easy to add to your favorite research papers?

The view history feature had the most variable result with a third (34.3%) of the respondents, or twelve (12) users, saying it's extremely easy, but around another third (31.4%), or eleven (11) users, answering in the middle. However, only 4 answered on the difficult side of the scale.

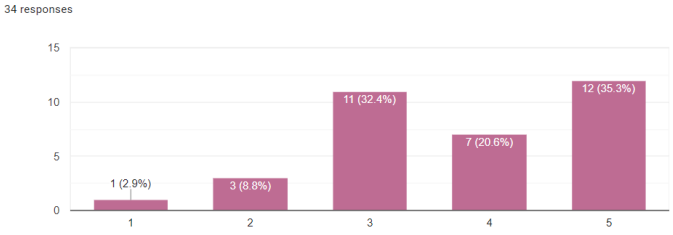

Fig. 9: Is it easy to add to your favorite research papers?

A huge majority of the respondents said that the service is useful to their research process and would recommend it to their peers.

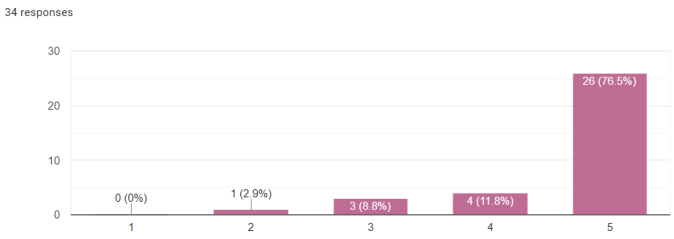

Fig. 10: Is it easy to add to your favorite research papers?

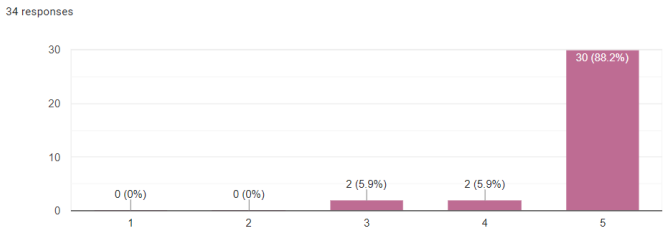

Fig. 11: Is it easy to add to your favorite research papers?

While the questions were mostly about the User Experience, it's result was based on the most recent deploy at the time of the survey. During the duration of the study, a new design was developed that would have addressed the most common feedback - a better User Interface. However, it was still under review.

The new Web UI:

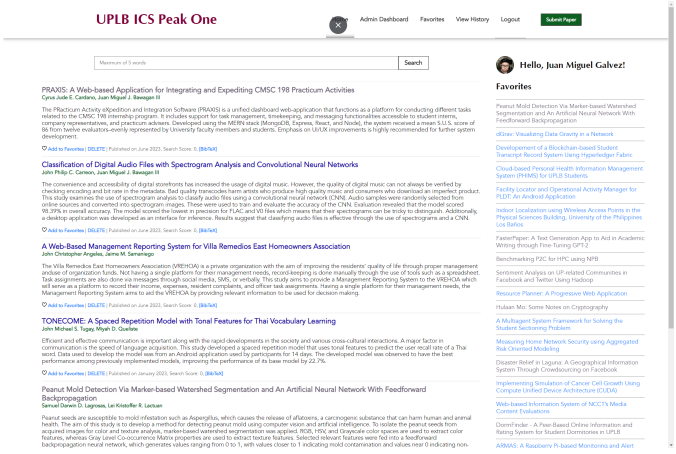

Fig. 12: Home Page

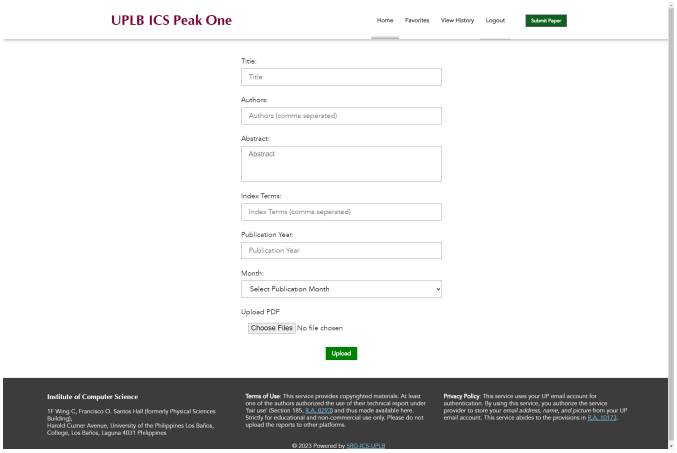

Fig. 13: Upload Page

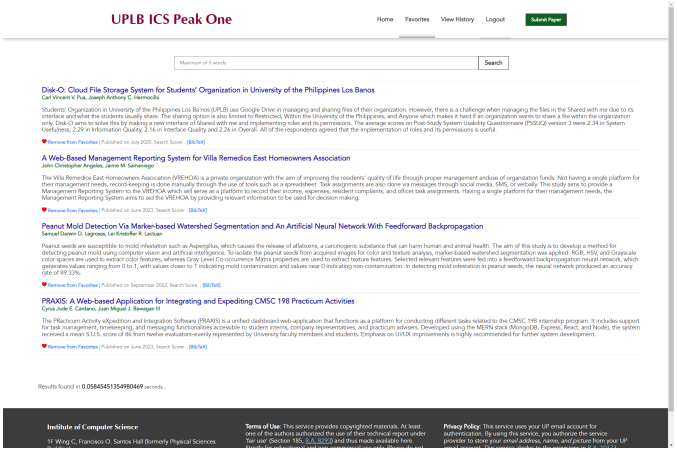

Fig. 14: Favorites Page

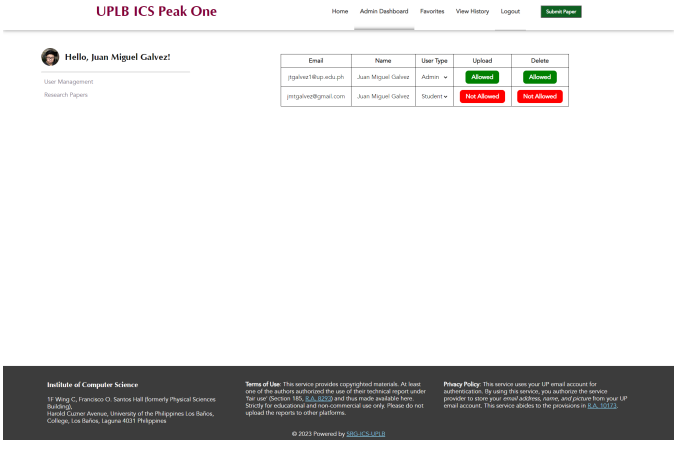

Fig. 15: User Management Page

V. Conclusion and Future Work

In conclusion, the deployment of this project is a significant step in enabling researchers to look up resources via the internet. Access to previous studies is no longer limited to visiting the ICS library or asking colleagues for a copy.

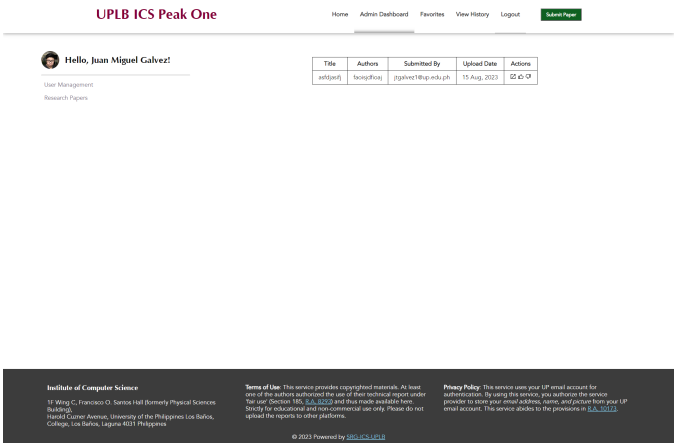

Fig. 16: Research Paper Management Page

The development of this service considered the use case of two users: admins and researchers.

While availability is the focus of this study and is an important step in managing the technical papers, for archival or research purposes, the service could be improved upon. The survey asked for feature request and other feedback. The respondents suggested the following:

- Search filters (ex. by author, by year published)
- Sorting of the results
- Paper Categories
- Better UI especially on mobile devices
- Tutorial
- Suggested / Featured on the home page
- Related Articles on the report page
- Author Profiles
- Mindmap Visualization ala SP Seek
- View Posters
- Quick copy of APA and other citation formats

Overall, the study has accomplished its goal of enabling online and remote access to technical papers of UPLB ICS.

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