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INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

E-PROCEEDING

EXTENDED ABSTRACT

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اوسها تقوى موليا

E-PROCEEDING

EXTENDED ABSTRACT



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Welcome Message RECTOR, UITM KEDAH BRANCH

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to extend my deepest appreciation to the organising committee of i-SPIKE 2025 for their steadfast dedication and commitment in making this prestigious event a reality. My heartfelt congratulations to the committee for their tireless efforts in ensuring that i-SPIKE continues to grow as a meaningful and impactful platform for academics, researchers, students, and industry players worldwide.

The theme for this year, “Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future,” is both timely and significant. It reflects our shared responsibility to not only embrace creativity and technological advancement, but also to ensure that innovation directly contributes to sustainable development, equitable education, and the well-being of future generations.

i-SPIKE 2025 provides a dynamic platform for showcasing innovations that address real-world challenges while opening new avenues for collaboration, engagement, and inclusivity. By bridging knowledge, innovation, and education, this symposium strengthens our collective capacity to design solutions that empower communities and inspire positive change.

I am truly impressed by the diversity and calibre of participants in this year’s event. The projects and ideas presented highlight the extraordinary creativity and determination of our innovators. I am confident that the insights and solutions shared here will pave the way for continuous advancement in teaching, learning, and innovation.

It is my sincere hope that you will find i-SPIKE 2025 an enriching experience, one that sparks new ideas, builds lasting collaborations, and strengthens our shared vision for a sustainable future. To all participants, I wish you every success, and to the winners, my warmest congratulations.

Once again, I thank the organising committee, partners, and contributors for their invaluable support. May i-SPIKE 2025 continue to inspire and empower minds for many years to come.

Professor Dr. Roshima Haji Said
Acting Rector
Universiti Teknologi MARA (UiTM) Kedah Branch

Welcome Message (i-SPIKE 2025 CHAIR)

It is my great pleasure to welcome you to the 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2025 (i-SPIKE 2025). This year's theme, "Empowering Minds: Bridging Innovation, Knowledge, and Education for a Sustainable Future," reflects our collective commitment to advancing innovation and fostering meaningful collaboration across academia, industry, and communities.

i-SPIKE 2025 provides a platform for scholars, researchers, students, and practitioners from diverse fields to showcase their ideas, share knowledge, and inspire new solutions to global challenges. We extend our sincere appreciation to all participants and contributors whose efforts and dedication have made this symposium possible.

We hope that this e-proceedings serves not only as a record of the innovations presented but also as a valuable resource that continues to inspire long after the event.

Thank you.

Dr Junaida Ismail
Chair

4th International Exhibition & Symposium on Productivity, Innovation,
Knowledge, and Education 2025 (i-SPIKE 2025)

PREFACE

The 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education (i-SPIKE 2025) marks yet another milestone in our ongoing commitment to fostering innovation, creativity, and collaboration across disciplines. Guided by this year's theme, "Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future," the event provides a dynamic platform for students, educators, researchers, and professionals to share their ideas, showcase their innovations, and engage in meaningful knowledge exchange.

This year, we are pleased to report that i-SPIKE 2025 received approximately 50 initial submissions, with more than 35 projects successfully advancing to final presentation and exhibition. These projects reflect a rich diversity of innovation, ranging from educational technologies, digital applications, and gamified learning tools to sustainable materials, cultural heritage preservation, and community-focused solutions. Collectively, they embody the spirit of bridging innovation and education to address pressing societal and global challenges.

We sincerely thank all participants, reviewers, and committee members for their invaluable contributions in making i-SPIKE 2025 a success. It is our hope that this e-proceedings will not only serve as a record of the ideas and innovations presented, but also as an inspiration for future collaborations and advancements in the pursuit of sustainable knowledge and innovation.

Assoc. Prof. Dr. Azlyn Ahmad Zawawi
Editor-in-Chief, i-SPIKE 2025 Proceedings

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CATEGORY 1
S&T (YOUNG)

ReProDB 2.0 : A DIGITAL GATEWAY TO SMARTER RESEARCH DATA MANAGEMENT

Jennifah Nordin

Faculty Administrative Science & Policy Studies, University Teknologi MARA Sabah Branch,
Kota Kinabalu Campus
jenni235@uitm.edu.my

Afida Arapa

Faculty Administrative Science & Policy Studies, University Teknologi MARA Sabah Branch,
Kota Kinabalu Campus
afida151@uitm.edu.my

Ibianaflorinciliana Niane Anthony Aning

Faculty Administrative Science & Policy Studies, University Teknologi MARA Sabah Branch,
Kota Kinabalu Campus
ibian962@uitm.edu.my

Intan Syahriza Azizan

Faculty Administrative Science & Policy Studies, University Teknologi MARA Kedah Branch,
Sg Petani Campus
intan219@uitm.edu.my

Nurfaizah Abbdullah

Faculty Administrative Science & Policy Studies, University Teknologi MARA Sabah Branch,
Kota Kinabalu Campus
nurfaizah856@uitm.edu.my

Asri Salleh

Faculty Administrative Science & Policy Studies, University Teknologi MARA Sabah Branch,
Kota Kinabalu Campus
asris897@uitm.edu.my

ABSTRACT

Most universities require both undergraduate and graduate students to complete research projects and submit their reports for evaluation and documentation. Traditionally, these reports are stored physically in faculty offices or library departments. In some institutions, students were asked to submit soft copies on CDs, which poses challenges such as potential data corruption, limited durability, and additional storage costs for cabinets or shelves. This manual process not only consumes physical space but also risks losing valuable research due to poor data management. Moreover, with new batches of students submitting reports each semester, storage requirements continue to grow. To address these issues, the group proposed the development of a web-based system called **ReProDB 2.0 (Research Project Database)**. This application aims to centralize the storage of all student research reports, making them easily accessible to both students and supervisors. The system is designed to reduce administrative workload, save time and resources, and enhance overall efficiency in managing research data. By digitizing the process, ReProDB minimizes the need for physical storage, lowers printing and office supply costs, and reduces reliance on manual labor. Furthermore, it ensures long-term access to research outputs and transforms research reports into valuable institutional assets through improved data management.

Keywords: research, database, web application

INTRODUCTION

Effective file management is crucial in any organization, including educational institutions. A well-maintained repository not only ensures that documents are properly stored, organized, and accessible but also supports smoother collaboration, enhances organizational efficiency, and prepares the organization to meet future demands with confidence. Institutional repositories serve as essential reservoirs of research data, playing a pivotal role in ensuring its long-term accessibility and usability while underpinning the entire research data lifecycle and advancing effective data management practices (Dube, 2025).

With advancements in technology, data repositories have evolved from physical storage and manual handling to web-based, digital systems that allow long-term access to information. These systems enable users to access data freely through open-source platforms. Since the data is stored in a digital and easily transferable format, electronic filing systems allow users to verify the existence of documents in the system—reducing redundancy and the risk of data loss. They also facilitate the easy creation, storage, organization, and distribution of documents (Kiely, 2020).

The **ReProDB** web application exemplifies such a system. It is designed to catalog, retrieve, and query data efficiently using a standardized method. The system manages incoming data by organizing it and offering users options to edit or delete entries as needed. ReProDB also allows for quick data sorting and filtering, streamlining the process of information retrieval. Beyond document storage, it improves workflow management, output tracking, and overall document control. ReProDB empowers institutions to monitor and access high-quality research with ease, while also proving to be a cost-effective investment and a catalyst for new knowledge discovery, as supported by Okon et al. (2020). These strengths collectively position it as a future-ready solution for building resilient and competitive information infrastructure.

PROBLEM STATEMENT

Information has traditionally been archived manually using programs such as Word, Excel, and other office tools, with printed copies stored in designated physical locations. However, when a team's document management strategy is ad hoc or temporary—such as storing files in a random Dropbox folder or physical filing cabinet, it can lead to disorganization and instability. Recent peer-reviewed studies discuss (i) significant time lost in paper-driven processes and better throughput when documents are digitized and structured, (ii) mounting storage, environmental control, and management burdens in physical archives, and (iii) staff productivity and safety gains when paper records are phased out in favor of electronic systems (Baniulyte et al., 2023; Berger et al., 2024; Di Marzo Serugendo et al., 2024; Mensah et al., 2024). Therefore, records must be properly preserved and securely managed to ensure long-term accessibility and integrity.

PRODUCT SPECIFICATIONS

Content of ReProDB 2.0 Web Application

The ReProDB Web Application enables both students and supervisors to upload and review research papers online. To submit a research project, students are required to enter their name and matriculation number, select their faculty and assigned supervisor, upload the study title and abstract, submit the Turnitin similarity index report, and finally upload the complete research document. Once the submission is complete, the system automatically notifies the supervisor via email. Supervisors can then log in to their accounts, review the submitted details and documents, and decide whether to approve the submission if they are satisfied with its accuracy and completeness. The system features a user-friendly interface, a structured submission process, and secure data storage to ensure efficiency and ease of use for all users. Figure 1, 2 and 3 are the user interface for the students, while Figure 3 and 4 are the user interface for supervisors. The database dashboard streamlines access to research data and documentation as shown in Figure 6.

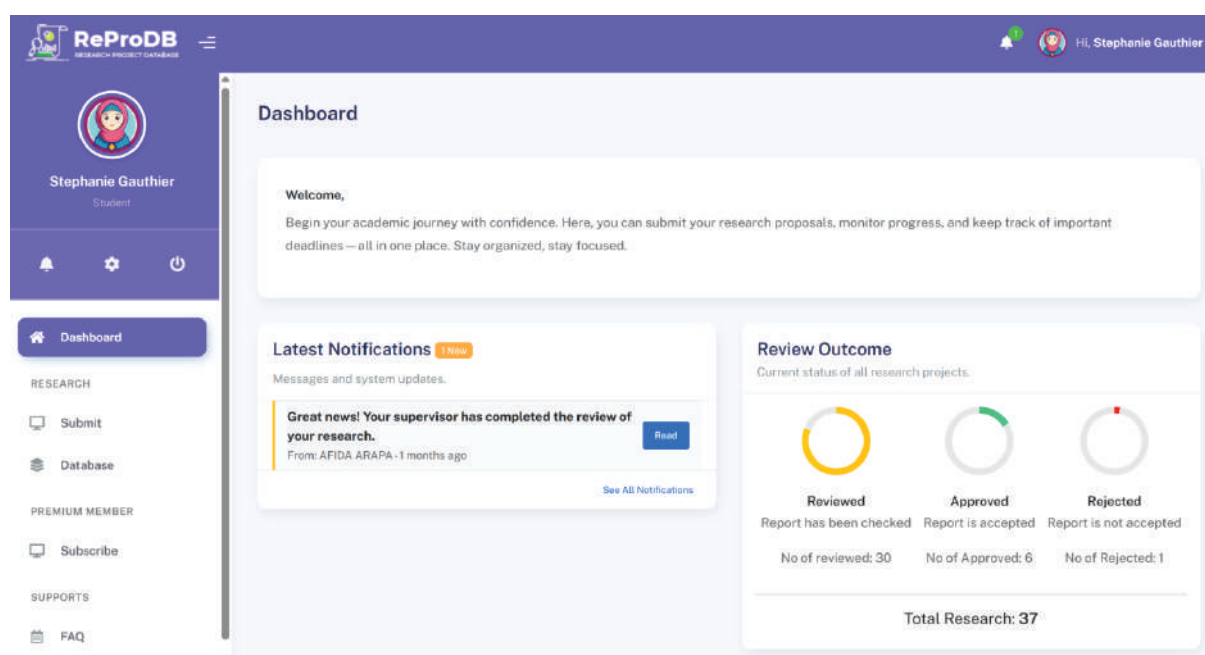


Figure 1. Research Project Database 2.0 (ReProDB 2.0) Dashboard Interface (for students)

My Research
List the research that I've submitted.

Search:

PROGRAM	SUBJECT	TITLE OF RESEARCH	RESEARCHER	TURNITIN READING	PDF FILE	SUBMITTED	STATUS	ACTION
AM228 - Bachelor Admin Science	ADS555 - Applied Research Project (Final Semester Project)	EFFECTIVE COMPUTER PROGRAMMING DELIVERY IN TERTIARY INSTITUTIONS: CHALLENGES AND PROSPECTS - A REVIEW	Stephanie Gauthier (A444422), Muhammad Radzi Bin Abdul Salleh (0142006178), Tommy bin Tommy (2020989898)	✓	✓	24 Jul 2025	Approved	
AM228 - Bachelor Admin Science	ADS555 - Applied Research Project (Final Semester Project)	IoT Based Monitoring Hydroponic Wick System	Stephanie Gauthier (A444422), Muhammad Radzi Bin Abdul Salleh (0142006178), Lee Min Ho (B1223334444)	✓	✓	2 Jun 2025	Approved	

Figure 2. The ReProDB 2.0 offers structured access to research abstracts, reports, and researcher details.

Add Research Data
You can submit a detail your research paper.
Please fill in all the required fields.

Session:

Supervisor / Lecturer:

Faculty:

Program:

Subject:

Title of Research:

Abstract:

Figure 3. An integrated platform for managing research information and project records (for students).

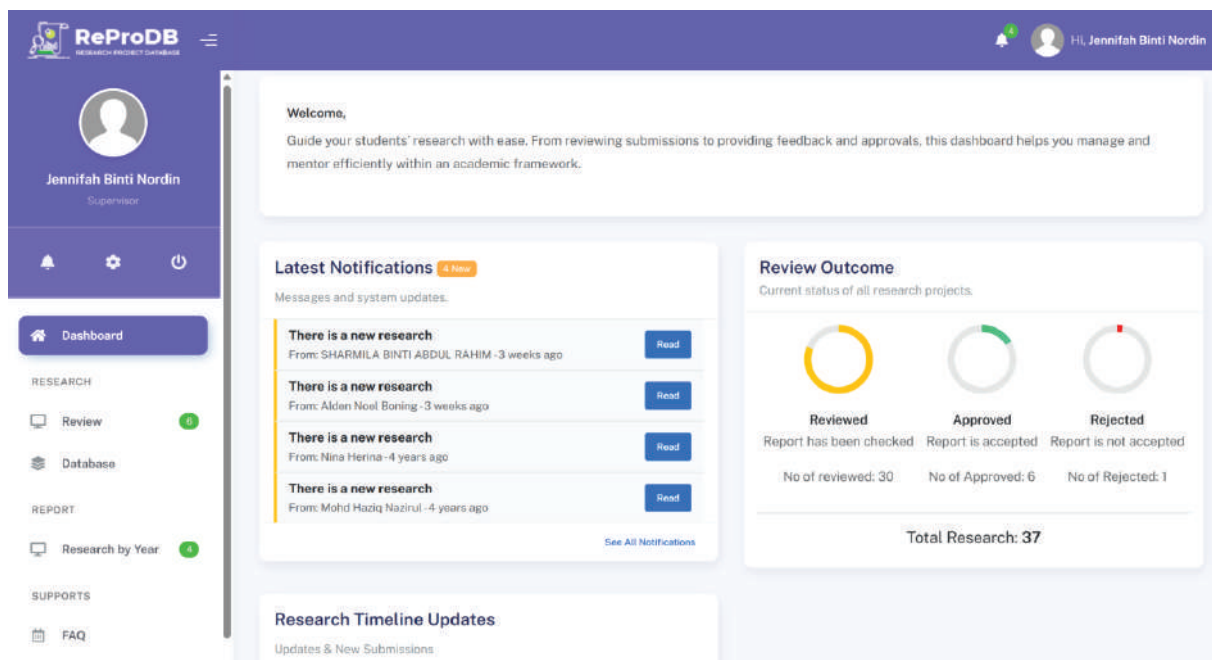


Figure 4. Research Project Database (ReProDB 2.0) Dashboard Interface (for supervisor)

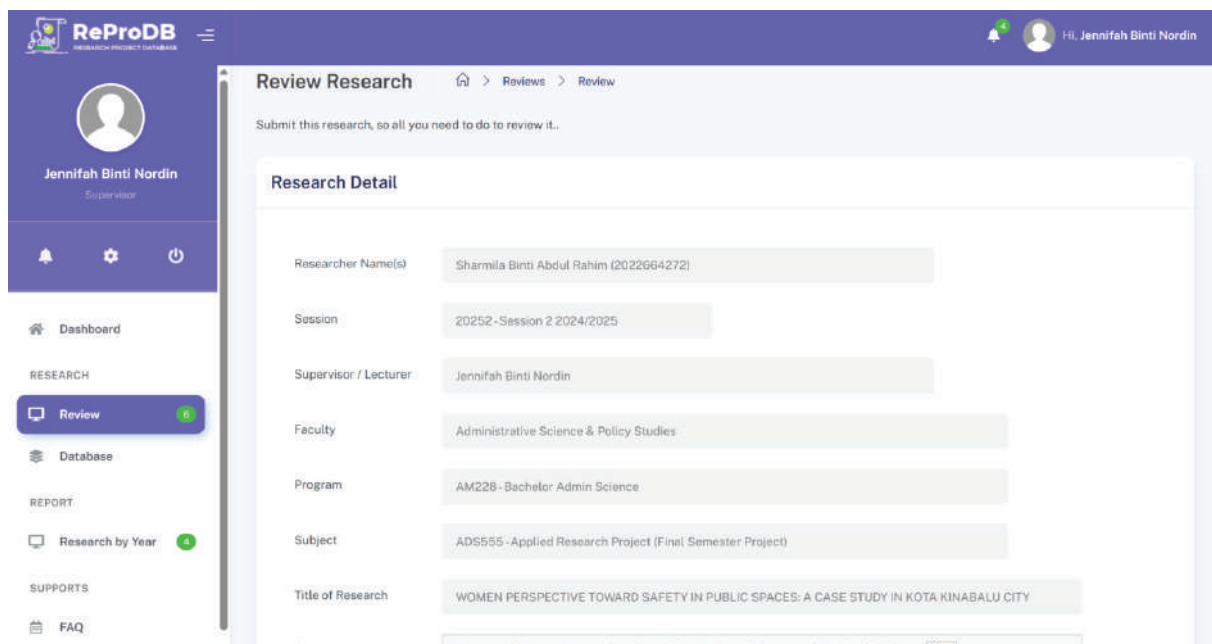
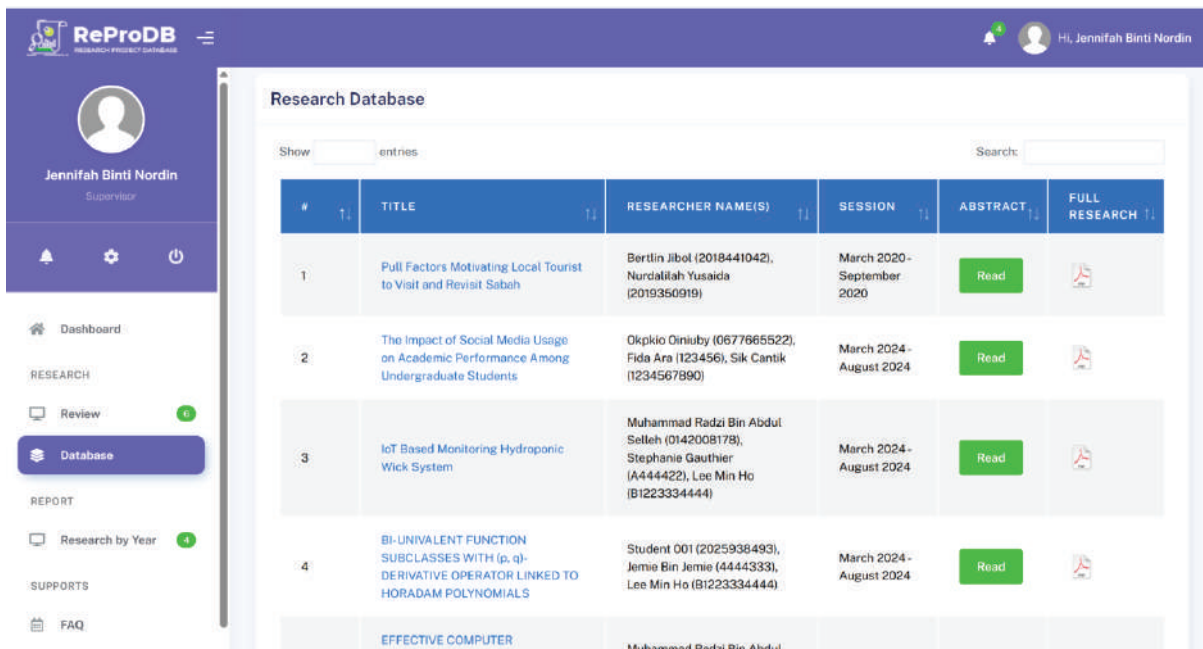


Figure 5. An integrated platform for supervisors to review research information and project records.



#	TITLE	RESEARCHER NAME(S)	SESSION	ABSTRACT	FULL RESEARCH
1	Pull Factors Motivating Local Tourist to Visit and Revisit Sabah	Bertlin Jibot (2018441042), Nurdalilah Yusaida (2019350919)	March 2020 - September 2020	Read	
2	The Impact of Social Media Usage on Academic Performance Among Undergraduate Students	Okpkio Oiniuby (0677665522), Fida Ara (123456), Sik Cantik (1234567890)	March 2024 - August 2024	Read	
3	IoT Based Monitoring Hydroponic Wick System	Muhammad Radzi Bin Abdul Seltah (0142008178), Stephanie Gauthier (A444422), Lee Min Ho (B1223334444)	March 2024 - August 2024	Read	
4	BI-UNIVALENT FUNCTION SUBCLASSES WITH (p, q)-DERIVATIVE OPERATOR LINKED TO HORADAM POLYNOMIALS	Student 001 (2025938493), Jemie Bin Jemie (44443333), Lee Min Ho (B1223334444)	March 2024 - August 2024	Read	
	EFFECTIVE COMPUTER	Muhammad Radzi Bin Abdul			

Figure 6. The ReProDB 2.0 system dashboard streamlines access to research data and documentation.

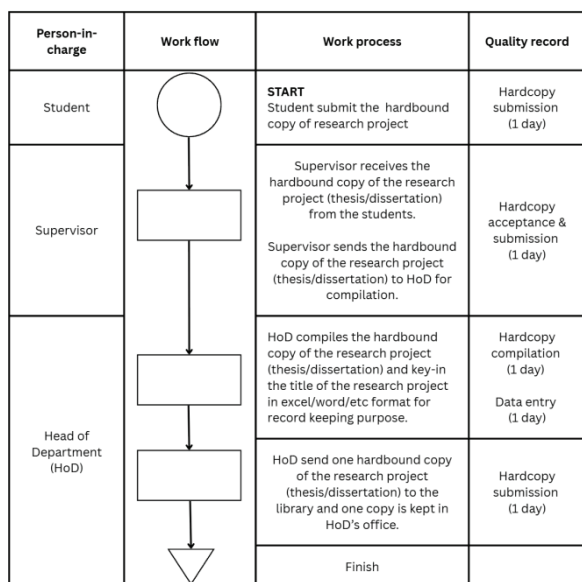
Advantages and Limitations of ReProDB 2.0 Web Application

No branch campus has yet implemented a centralized faculty research database. Hardbound copies of research papers are stored physically in the library and departmental offices, requiring considerable space to accommodate them. Additionally, all research topic data is manually managed using Word, Excel, and other similar formats. The responsibility of maintaining this data typically falls on the department head, resource person, or lecturer-in-charge. While this system allows limited monitoring, its subscription-based access restricts availability, preventing students/researchers and other stakeholders from viewing the full information. Such limited accessibility may hinder students from proposing novel research topics, potentially leading to duplication and redundancy. Students and supervisors can access and utilize the ReProDB 2.0 Web Application anytime and from any location, making it highly effective for record keeping. Digital platforms like ReProDB enhance authorization and access control while reducing the risk of physical damage. Moreover, it protects valuable records from unauthorized access and safeguards years of research data against unexpected natural disasters such as floods and fires (Nextprocess, 2019). Table 1 below states the advantages and limitations of ReProDB, and Figure 7 highlights how ReProDB transforms the traditional research submission and record-keeping process into a streamlined, efficient, and accessible workflow.

Table 1. Advantages and limitations of ReProDB 2.0 web application

Advantages	Limitations
Paper-free and environmentally responsible	The implementation has yet to be extended to every branch campus of the faculty
Economically sustainable because institutions can reduce unnecessary purchasing to manage data storage	Absence of research domain
Provide hosting research databases and promoting ease of access	Access is restricted to registered and authorized members
The digitalization of records promotes work efficiency by reducing the administrative burden of handling physical documents	Notification functions are confined to email, specifically for supervisors
Novel user-friendly interface that supports continuous accessibility from diverse locations.	
Promotes robust data security and protection measures	
Capable of storing vast volumes of data	
Able to view and download full paper with affordable subscription fee	

Original workflow of research project submission & record keeping



ReProDB workflow of research project submission & record keeping

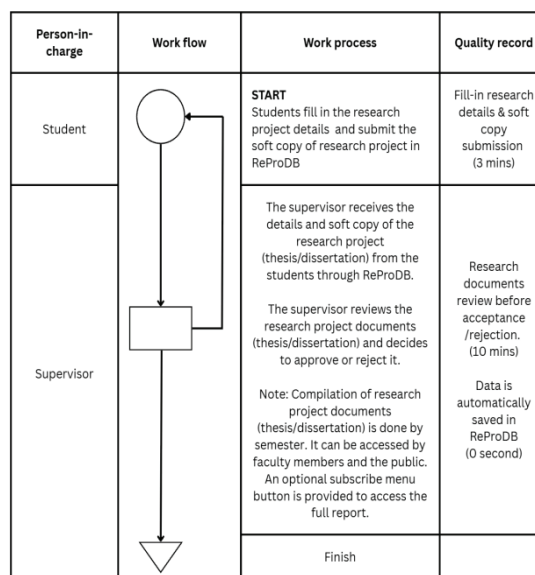


Figure 7. Original research submission and record-keeping workflow and ReProDB research submission and record-keeping workflow

Novelty and Commercialization

The ReProDB Web Application has the potential to be adopted by all faculty branch campuses where such a system is not yet available. Its use is highly relevant and strongly recommended not only for faculty branch campuses but also for other faculties, research departments, and educational institutions, as well as public and private sectors. Any organization seeking to ensure the security of its document database and implement effective submission monitoring can benefit from this system. This application is not only designed to support academic and administrative functions, but it also has the potential to serve as an income-generating tool for the faculty. By offering selected services or data access to users, faculty and even the university can create new income streams that can later be channeled to support teaching, research, and student development initiatives.

Award

The web application was awarded the silver medal at the i-SPIKE 2023 competition, affirming its innovative potential. Building on this recognition, the system has since been enhanced with advanced features that significantly elevate its functionality and deliver greater value to end users.

METHODOLOGY

Flowchart of ReProDB Web Application

In the ReProDB system, lecturers register as supervisors while students sign up as researchers. As shown in Figure 8, the process begins with the student registering, uploading, and submitting the full report. The supervisor then reviews and evaluates the submission, providing feedback and ultimately deciding whether to approve or reject the proposal.

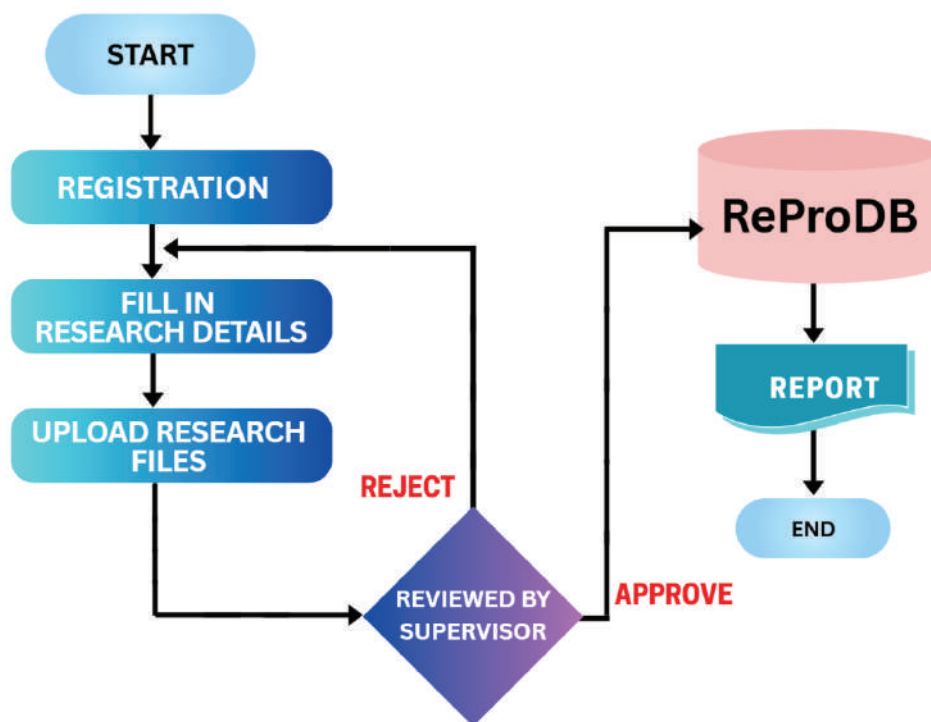


Figure 8. Flowchart of ReProDB Web Application

User-Level of ReProDB Web Application

Student:

In order to utilize the system, students must first complete the registration process. Once registered, they gain access to a database of research titles accumulated by the faculty, providing valuable guidance during the initial phase of research topic selection. The system ensures secure storage of all data and further facilitates the submission of completed research projects to the respective supervisors.

Researcher/Public:

Once provided with the link, researchers and members of the public may access the system. However, they are limited to viewing the main page and abstract only, which displays a list of research projects, including the title, the researcher and supervisor names, and the semester of completion.

Supervisor:

Administrators register supervisors based on a list provided by the head of faculty, resource person, or lecturer-in-charge. Supervisors may be granted access to the complete list of research titles previously compiled by the faculty. This repository serves as a reference resource to support supervisors in guiding their supervisees during the process of research topic selection.

Administrator:

The application is controlled by two classes of administrators with distinct responsibilities. The IT Unit administrator oversees technical functions, including networking, internet connectivity, and server hosting, while the faculty administrator oversees operational activities. In addition, the faculty administrator determines any technical issues which require IT administrators concern and actions.

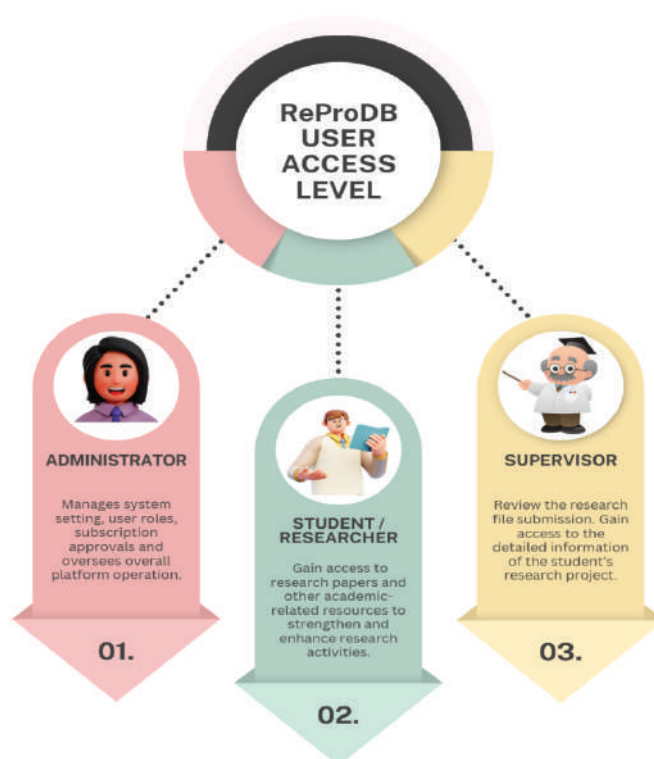


Figure 9. The user access level of the ReProDB 2.0 web application.

FINDINGS

To gain deeper insights into students' experiences using the ReProDB 2.0 Web Application, a questionnaire survey with 15 questions was conducted. The survey focused on various aspects, including the usage of the ReProDB system, its objectives and benefits, as well as respondents' overall perceptions. The results indicate that all respondents expressed overall satisfaction with the ReProDB 2.0 Web Application. Only one respondent reported encountering challenges related to three specific aspects, which highlights the system's strong performance while also providing valuable insights for further enhancement.

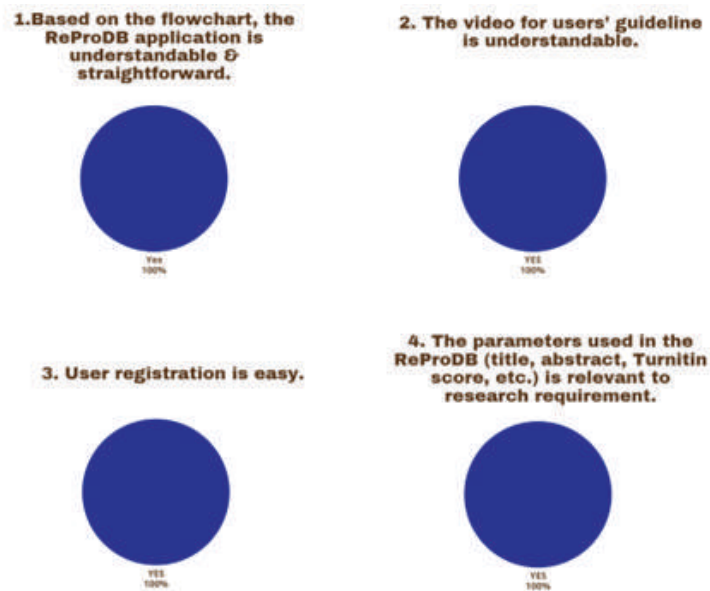


Figure 10. Users view on ReProDB 2.0 flowchart, users' guideline, registration and parameter used.

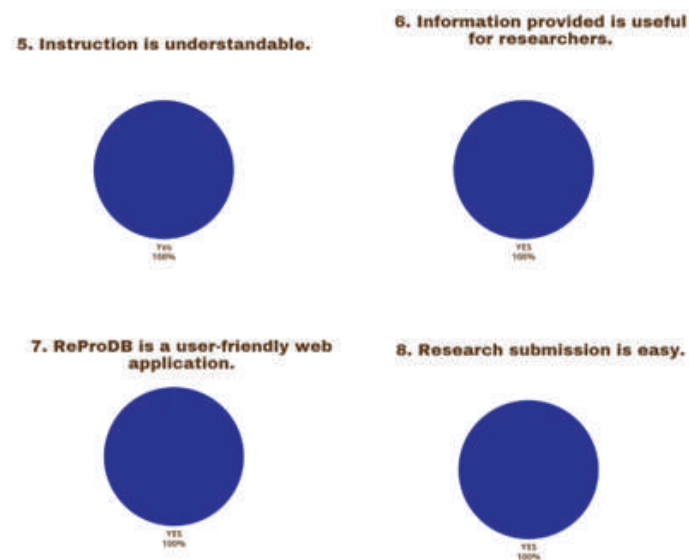


Figure 11. Users view on instruction, information provided, user-friendly and submission process.

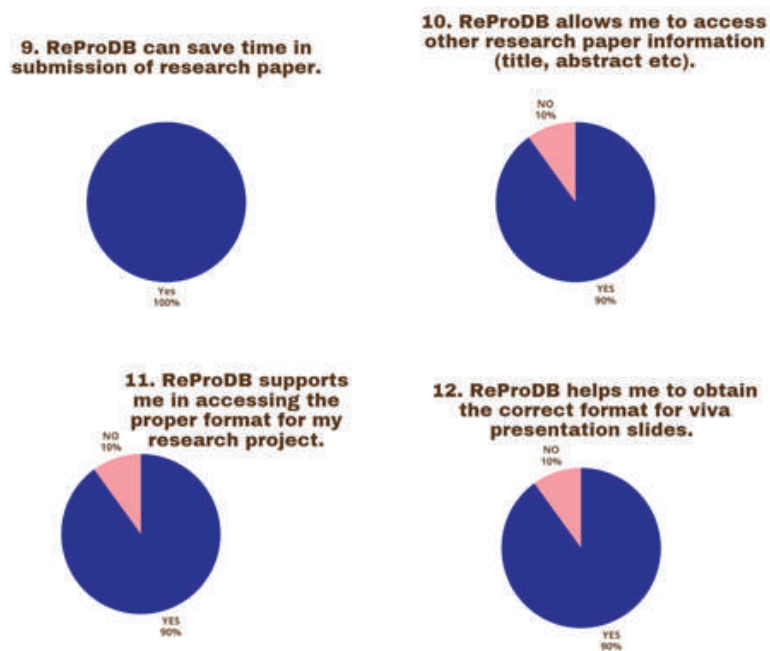


Figure 12. Users view on registration time saving, access to other research paper and documents.

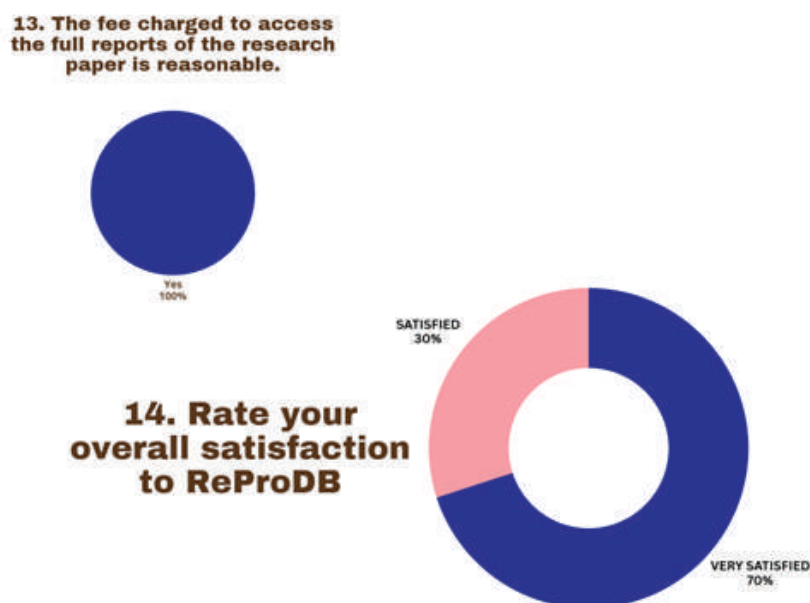


Figure 13. Users view on the subscription fee and overall satisfaction of ReProDB 2.0.

Suggestions provided by the users on the features or items to be incorporated into the ReProDB database are also collected from the survey.

Table 2. Users' suggestions and views on ReProDB database

No	Suggestions and views given by users
1.	It would be reassuring to know the marks from the report grading here.
2.	Perhaps the web should provide two methods—one for the user having an account and another for those without an account of ReProDB.
3.	It would be interesting if there were a feature that analyzed papers based on how their findings align or differ, like in ConnectedPapers.
4.	We don't exactly know when the date was published.
5.	The website is user-friendly, conveniently accessible, and will be very useful for future researchers who need guidelines on how to start their research. Overall the website is very useful.

CONCLUSION

In conclusion, the ReProDB 2.0 web application is expected to benefit a wide range of users, including administrators, researchers, and academic institutions. It serves as an efficient, easily accessible, and centralized digital repository for student research. In addition, the system has the potential to reduce costs associated with storage and human resources while promoting a paperless working environment. Lecturers can also leverage the stored data to analyze research trends and students interests. Furthermore, the application utilizes its advanced features to create a potential income-generating platform for the faculty and university, offered through a subscription model. The revenue generated can be strategically reinvested to strengthen academic initiatives, support research activities, and enhance student development programs.

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