

Scholarize: A Digital Ecosystem for Enhanced Research and Collaboration

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Abstract

At Paragon International University, undergraduate ICT students face significant challenges in their final year research projects, including lack of references for past research papers and ineffective management of their research project. Advisors also struggle with managing multiple student groups which results in ineffective and restrictive collaboration. This paper introduces "Scholarize," a web-based digital platform designed to address these issues by integrating a research repository, task management, file storage, and scheduling tools into a single, unified system. The platform was developed using a Simplified Extreme Programming (SXP) model and evaluated through user acceptance testing with junior students, senior students, and academic advisors, guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. The findings indicate that Scholarize is well-received by all user groups, who expressed a strong intention to use the system. The study reveals that the key drivers for adoption vary by user group, social influence is most critical for juniors, performance expectancy for seniors, and effort expectancy for advisors. This research provides a validated blueprint for an integrated platform that effectively supports and enhances the academic research process within a university setting.

Keywords: Research Repository, Research Collaboration, Digital Ecosystem

Introduction

At Paragon International University (ParagonIU), completing a final-year research project is a crucial requirement for students in the ICT faculty to develop academic mindsets and critical thinking. However, both students and advisors face significant challenges. Preliminary research, including a survey of 70 students, including juniors and seniors from ICT faculty of Paragon IU, and interviews with 4 academic advisors in the same university identified key issues that affected the research process.

For students, the main challenges are a lack of references, where they have difficulty accessing past research papers for inspiration and reference since the library provided limited physical copies, and ineffective management of their projects, where they have trouble tracking tasks and keeping research files organized. For academic advisors, the problems come from restrictive collaboration, such as scheduling conflicts due to heavy workloads, and ineffective collaboration, which includes the difficulty of monitoring multiple student groups and accessing research files stored across various platforms. While individual commercial tools can address specific issues, the use of multiple, disconnected systems creates a fragmented and inefficient research workflow for both the students and advisors. There is a clear need for a centralized platform that integrates these functions into a unified ecosystem.

This paper introduces "Scholarize", a digital web platform developed to integrate solutions into a single, unified platform. Scholarize features a research repository for users to search and



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download papers, alongside collaboration tools including task management, file storage, and scheduling. The main objectives of this study are to develop and deploy Scholarize within Paragon International University and to conduct user acceptance testing to evaluate its effectiveness in tackling the identified challenges.

Related Literature

The essential role of institutional repositories is to collect, preserve, and disseminate a university's digital intellectual output, thereby promoting open access and overcoming the limitations of traditional library collections (Santos-Hermosa, 2023). This issue is reflected at Paragon International University (ParagonIU) by (Moul, 2023), who proposed the "Paragon Research Databank" to give students at ParagonIU specific access to past research papers. However, Moul's contribution was conceptual, leaving a clear gap between the proposed solution and its real-world implementation and evaluation.

Beyond simple access, technology plays a vital role in enhancing the collaborative aspects of the research process itself. (Schwarz, 2022) mentioned that a well-structured digital environment can significantly boost research advancement and team productivity. This is often achieved through a combination of specialized tools. This is often achieved through specialized commercial tools, such as project management platforms for tracking tasks (Gerdisch, 2021) and cloud storage services for efficient file management (International Research Journal of Modernization in Engineering Technology and Science, 2022). The effective use of such tools, particularly for scheduling and transparent task tracking, is also known to increase student motivation and create a more engaging and productive research process (Valentinovna, 2023).

In constructing a functional application within a constrained academic timeframe while accommodating changing user requirements, the Simplified Extreme Programming (SXP) model was selected as the development methodology (Anwer & Aftab, 2017). To evaluate whether the developed platform would be accepted by its intended users in a structured, academic manner, the Unified Theory of Acceptance and Use of Technology (UTAUT) was chosen as the evaluation framework, as it is a comprehensive and widely validated theory for predicting technology adoption, making it the ideal choice to scientifically measure user intentions (Venkatesh et al., 2003).

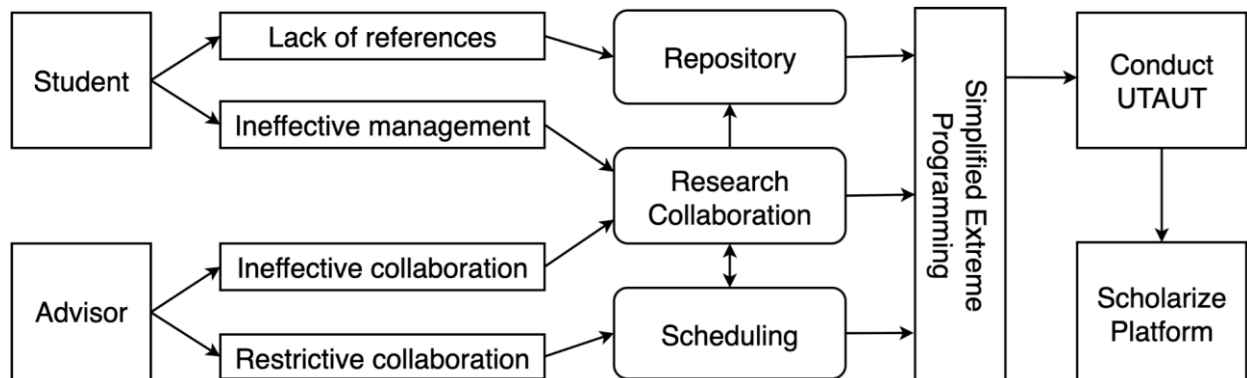
Research Design and Methods

The research process was guided by the conceptual framework shown in Figure 1, which maps the core challenges faced by students and advisors to the platform's primary solutions. The development of these solutions was conducted using the Simplified Extreme Programming (SXP) model (Anwer & Aftab, 2017), which has the flexibility in managing changing requirements of projects effectively and perfect for a tight schedule project. Additionally, the platform integrates multiple services to provide a seamless centralized digital ecosystem for users, as shown in Figure 2. Following development, the platform was successfully deployed on an on-premise server provided by Paragon International University. To evaluate the platform's effectiveness, a quantitative user acceptance study was conducted. Participants were recruited from Paragon International University and included students and academic advisors. These groups were chosen because they represent the primary end-users of the Scholarize platform. The student sample was specifically composed of junior and senior

students to capture perspectives from different stages of the academic journey. Data was gathered via questionnaires framed by the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003).

Figure 1

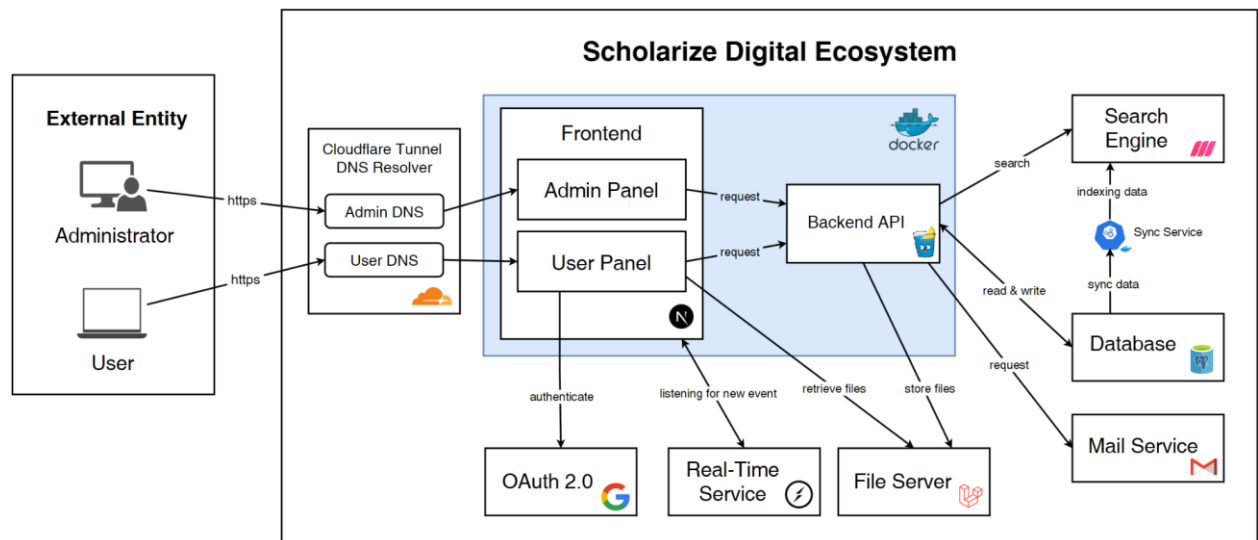
Conceptual Framework of Scholarize



Note. This framework illustrates the key challenges identified for students and advisors at Paragon International University, the corresponding Scholarize modules designed to address these issues, and the overall research and development process.

Figure 2

Scholarize System Architecture



Note. This diagram illustrates the key technical components of the Scholarize platform and the flow of information between the frontend, backend API, supporting services, and external APIs.

The Scholarize platform is built on a modern, service-oriented architecture designed for security, scalability, and real-time functionality (as shown in Figure 2). All external user and administrator requests are routed via HTTPS through a Cloudflare Tunnel, which provides a secure entry point and resolves DNS to the appropriate frontend interface. The Frontend is a server-rendered application built with Next.js, including a User Panel and an Admin Panel to deliver tailored experiences for each role. User authentication is handled securely via the OAuth 2.0 protocol. The core of the ecosystem is a containerized Backend API, which serves as the central operator for core

logic and data flow. This backend interacts with several dedicated services and subsystems such as PostgreSQL database, search engine that regularly syncs with the database, file server, and mail service. To enhance user experience, the frontend also listens for updates from a Real-Time Service, enabling dynamic, event-driven interactions without needing to refresh the page.

Results

A comprehensive user acceptance test of the Scholarize system was conducted with 37 junior students, 39 senior students, and 5 academic advisors using the UTAUT framework. The overall reception was highly positive, with mean scores for all constructs across all groups consistently above 4.0 on a 5-point scale, indicating a strong level of acceptance. Analysis of the UTAUT constructs revealed that each user group prioritized a different factor. For junior students, Social Influence was the highest-rated construct (Mean = 4.43, SD = 0.62), suggesting a strong reliance on peer recommendations. In contrast, seniors prioritized the system's usefulness, rating Performance Expectancy highest (Mean = 4.71, SD = 0.55). Finally, academic advisors most valued the platform's ease of use, reflected in the high score for Effort Expectancy (Mean = 4.89, SD = 0.21). The very low standard deviation for advisors indicates a near-unanimous consensus on the importance of an efficient user experience.

Table 1: Mean and Standard Deviation (SD) of UTAUT Construct by User Group

UTAUT Construct	Juniors (n = 37)		Seniors (n = 39)		Advisors (n = 5)	
	Mean	SD	Mean	SD	Mean	SD
Performance Expectancy	4.15	0.70	4.71	0.55	4.60	0.49
Effort Expectancy	4.21	0.75	4.65	0.60	4.89	0.21
Social Influence	4.43	0.62	4.22	0.71	4.30	0.50
Behavior Intention	4.35	0.65	4.62	0.50	4.81	0.29

Note. Responses were measured on a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree.

Crucially, Behavioral Intention to use Scholarize was strong across all cohorts, with advisors showing the highest intent (Mean = 4.81, SD = 0.29). This confirms that despite differing motivations, all user groups are highly likely to adopt the platform. In addition to user acceptance, performance testing confirmed the platform's technical stability. Load testing with 100 concurrent users and stress testing with 10,000 concurrent requests demonstrated system resilience and readiness for a full-scale university deployment.

Discussion

The findings from this study confirm that Scholarize is an effective and highly rated digital ecosystem within Paragon International University. The platform demonstrated a strong performance evaluation and a high user acceptance across all juniors, seniors, and advisors. The most significant insight from this study is how the primary factor for adopting Scholarize differed across the user groups. For junior students, who are newer to the research process, Social Influence was the most

critical factor, suggesting they rely on guidance from peers and faculty. In contrast, seniors, focused on the outcome of their final projects, prioritized Performance Expectancy, valuing the platform's ability to directly enhance their workflow. For advisors managing heavy workloads, the most crucial factor was Effort Expectancy, highlighting their need for simple and time-saving solutions.

Despite these positive outcomes, there are certain limitations that should be acknowledged. The evaluation was primarily conducted within the ICT faculty at Paragon International University, so findings may not be directly generalizable to other institutions with different research practices or infrastructure. The platform's optimal performance also relies on the university's internal network capabilities, and the initial version focused on web access, with full mobile responsiveness identified as an area for future development.

Conclusion

This study demonstrates the successful implementation of “Scholarize”, an integrated digital platform that effectively addresses key research challenges within the ICT faculty of Paragon International University. By confirming the platform's technical strength and its strong acceptance by the target users, this work provides a validated model for other research institutions. The primary contribution of this work is the identification of how technology adoption factors differ based on a user's academic role, which serves as an insight for future development of educational technologies.

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