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Knowhub: A Digital Archive of BSIT Resources for Pangasinan State University - Alaminos City Campus

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ABSTRACT

In the digital age, it is essential for the Bachelor of Science in Information Technology (BSIT) department to adapt to advancements in the educational system. Despite this digital transformation, students and faculty still encounter challenges because learning resources are dispersed across platforms such as Google Drives, USB drives, and chat groups. Faculty members also handle various responsibilities and designations, which often prevent them from immediately assisting students and cause delays in accessing important academic materials. To address these issues, KnowHub was proposed to centralize and organize educational content, allowing users to access resources more efficiently. With proposed features such as version control, and secure role-based permissions to protect sensitive academic assets. By consolidating essential information into one platform, the system reduces confusion, minimizes redundancy, and ensures that academic materials are consistently available when needed. This study presents a developmental and descriptive research approach and follows the Agile Model. Interviews were conducted, and purposive sampling was applied to gather evaluations through survey questionnaires completed by students and alumni. The study demonstrate that KnowHub will effectively address existing problems and provides a solution for improving resource management within the BSIT department. The system will not only enhance access to information but also supports more efficient academic workflow, contributing to a more organized and technology-responsive learning environment.

Keywords— Digital, Finding Resources, Repository, Information System, Bsit

INTRODUCTION

In today's rapidly evolving education system on which we are having the world at our fingertips and being integrated with advancement and innovation of technology, lies the crucial role in how to make use of the internet to help professors and students find institutional information with ease. Having more convenient and comfortable access to high-quality learning resources that can meet everyone's satisfaction level and contentment is essential to ensure organized, accessible and up to date resources [1].

Adapting digital repositories in education has become essential in ensuring accessible and efficient collaborative learning. Recent studies emphasize their role in supporting students' learning and addressing challenges in fragmented storage and usability [2]. Furthermore, the shift to online and blended learning during the COVID-19 pandemic has highlighted the need for reliable systems that can sustain both students and educators in maintaining continuity of learning [3].

In the Philippines, the importance of safeguarding and digitizing academic records is reinforced by Republic Act 9470, which mandates the preservation and proper management of institutional documents [4]. More recent initiatives, such as enhanced online repository services, demonstrate efforts to modernize document management, yet challenges in version control and accessibility remain [5]. Similarly, secure digital repository frameworks have been proposed to strengthen knowledge management in academic institutions, further underscoring the relevance of institutional archiving systems [6].

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At Pangasinan State University–Alaminos City Campus (PSU-ACC), the BSIT program continues to experience similar difficulties in managing its academic resources. One of the gaps that the proponents observed was that students and faculty often face critical resources dispersed over drives, USB drives, and unofficial social media groups, leading to significant inefficiencies and version conflicts. Academic continuity is disrupted by knowledge attrition, which happens when retiring faculties and students take resources and expertise with them. Faculty members are not solely focused on teaching students, as they also hold various roles and responsibilities within the campus. As a result, they may not always be able to immediately address or tend to students' needs, especially when they are suddenly tasked with responsibilities related to their designated roles. Therefore, providing resources or assistance to students might be delayed.

Hence, to address these challenges and ensure learning materials are consistently available when needed, the proponents proposed KnowHub, a system designed to centralize and organize educational content. The system aims to: (1) analyze the existing process of storing, managing and accessing BSIT educational materials at PSU Alaminos City, Campus; (2) identify the problems encountered by students and faculty in the current resource management system; (3) design and develop features tailored to the needs of the BSIT program; and (4) evaluate the effectiveness and usability of the developed system. By centralizing resources and improving accessibility, the project supports not only academic continuity but also PSU's broader digital transformation [7].

METHODOLOGY

The proponents employed a descriptive-developmental research design to create the Educational Resource Archive System for the BSIT Program at PSU Alaminos City Campus.

The descriptive study approach is used to identify and document underlying processes that are amenable to technological change, facilitating the transition of paper-based algorithms into accurate, effective, portable, and user-friendly digital interfaces [8].

Consequently, the process of developmental research directs the study in building and engineering the software, ensuring that all features align with the client's specifications. This methodology describes the iterative cycle paths necessary to produce a consistent and effective application through the systematic design, development, and evaluation of instructional or technological products [9].

In developing the proposed system, the proponents chose to adopt the Agile methodology, see Fig. 1, as the System Development Life Cycle (SDLC) approach. This model was selected due to its flexibility, adaptability, and focus on continuous improvement. Agile enables the team to build the system in short, manageable development cycles called sprints, allowing for regular feedback, rapid adjustments, and incremental delivery of functional components [10]. Involving six phases – Requirements, Design, Development, Testing, Deployment, and Review.

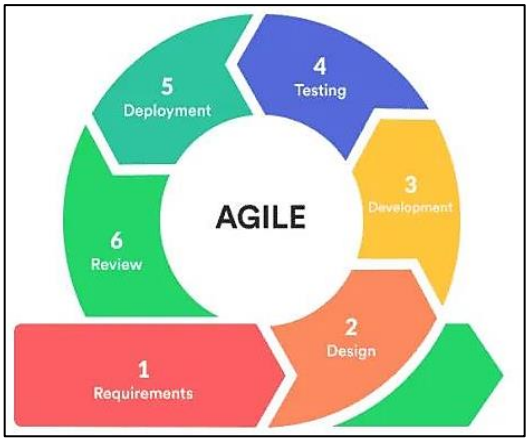


Fig. 1 Agile Methodology Model

Source: https://tinyurl.com/y67kc6fz

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Requirements phase involves planning, and gathering data to identify the project's requirements, objectives, and scope. It ensures that both functional and non-functional needs are clearly documented and understood by the team. During this phase, the proponents conducted data collection through interviews and surveys with instructors and students of the BSIT program at Pangasinan State University – Alaminos City Campus. The data collected was then analyzed and user requirements will be identified.

Design phase focuses on designing the system architecture, user interface, and database structure. Wireframes and mockups are created to visualize how users will interact with the system. During this phase, the proponents will use wireframing tools to sketch out the interface for each major feature. Database relationships are defined using ER diagrams, and the team will be preparing schema designs.

Next is the development phase which refers to the actual development of the system, done incrementally over multiple sprints. Features are built, reviewed, and refined in cycles, starting with the most critical components. In this stage, the developer will begin coding the system using PHP for the backend. HTML, CSS, JavaScript, and Bootstrap were used to build responsive interfaces. MySQL serves as the database platform, managed through phpMyAdmin. Development will be made in Visual Studio Code, and modules are tested and improved.

Testing is the phase where the system will be tested continuously to ensure that each function meets user expectations and is free from errors. Unit, functional, and user acceptance testing are applied throughout. The proponents will test every complete module. Features like login validation and version detection were tested for both functionality and usability. Feedback from instructors and test users will be helpful in identifying areas that require polishing.

During the deployment phase, the researchers are expected to transfer the fully tested system into a live environment where it can operate under real-world conditions. This involves setting up the hosting environment, configuring the necessary software and ensuring that all system components—such as the database, backend, and user interface— function seamlessly together. In this study, the system was planned to be published online and made live, allowing users to access it directly. The database and backend will be properly linked, and user accounts were initialized for demonstration purposes.

Lastly, review phase focuses on evaluating the system's effectiveness and collecting feedback to plan future improvements. It ensures the system continues to meet user needs. The proponents will distribute evaluation forms to selected students and instructors after deployment. Responses will be reviewed to assess satisfaction with features, ease of use, and interface design.

There are a total of four (4) interviewed faculty members of the IT Department and one (1) IT expert complemented by a larger group of 97 student and graduate respondents, bringing the total study population to 102 participants. The researchers used purposive sampling to select a number of students' respondents from BSIT PSU-ACC, as well as the alumni. Information about educational resources, repositories, and digital libraries was derived from secondary data sources such as the internet.

TABLE I Respondents of the Study

Respondents	Number of Respondent
IT Faculty Members	4
BSIT 2nd Year Students	14
BSIT 3rd Year Students	32
BSIT 4th Year Students	41
BSIT Graduates	10
IT Expert	1
Total Respondents	102

To determine the acceptability of the proposed system, the researchers will use a Scale of Measurement to rank feedback from 1 to 5, where a higher score means a higher level of acceptability. To ensure accuracy, the

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researchers set specific statistical ranges to categorize the results. These limits and their meanings are shown in Table II below.

TABLE II Scale of Measurement

Scale	Statistical Limits	Rating	Descriptive Interpretation
1	1.00-1.80	Not Evident	Condition is needed ormissing.
2	1.81-2.60	Less Evident	Condition is adequate and functioning is fairly.
3	2.61-3.40	Evident	Conditions are limited and function properly.
4	3.41-4.20	More Evident	Condition is functioning properly.
5	4.21-5.00	High Evident	The condition is very extensive and functions very well.

RESULTS AND DISCUSSION

KnowHub is a centralized digital archive system designed to enhance the management, accessibility, and organization of BSIT academic materials at Pangasinan State University, Alaminos City Campus. By providing a secure and unified platform, both faculty and students can manage and retrieve resources more efficiently than through fragmented traditional methods. The following discussion outlines the conceptual framework of KnowHub: A Digital Archive of BSIT Resources for Pangasinan State University – Alaminos City Campus. The system framework for KnowHub is shown in Fig. 2 below.

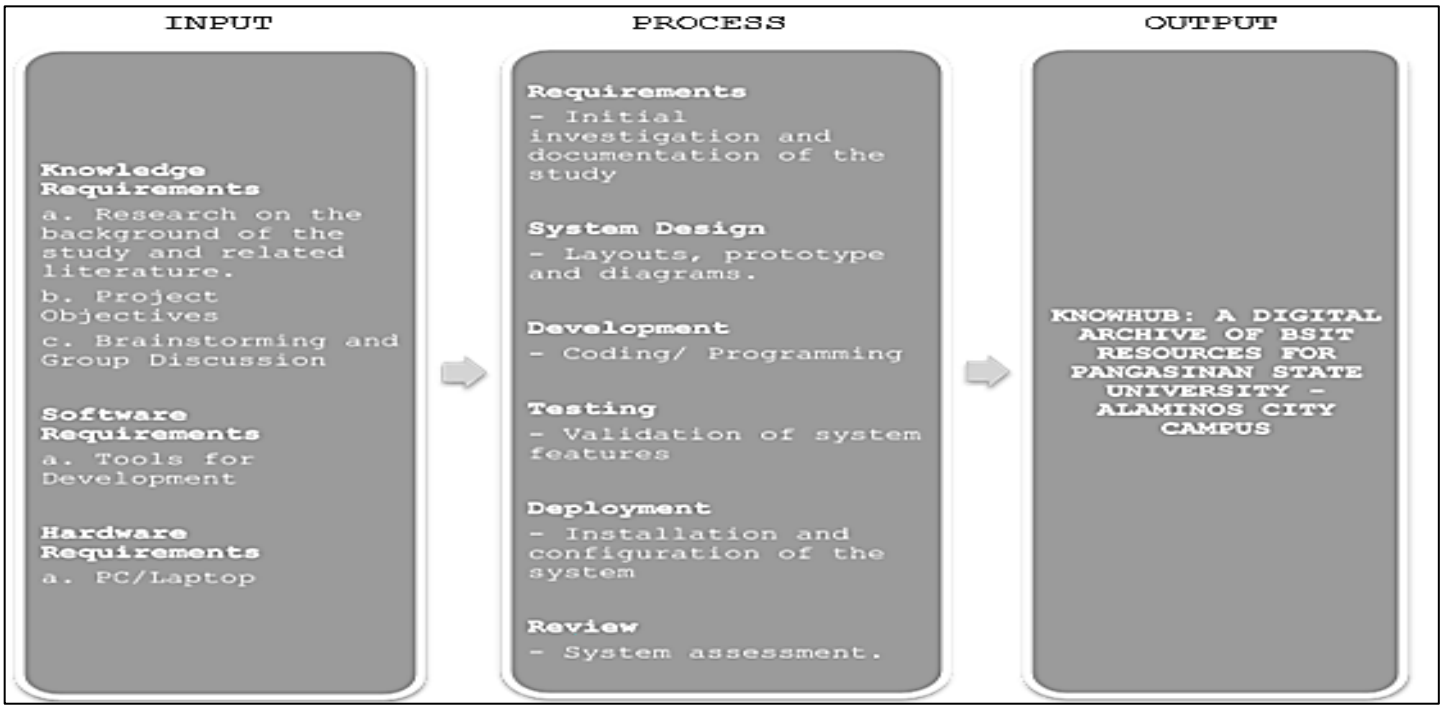


Fig. 2 Input Process Output Framework Model Created by the Authors

The Input-Process-Output (IPO) framework—also called an IPO model or IPO diagram—is a visual tool used to describe a workflow, the flow of information, or activities within a system. An IPO diagram helps the proponents identify all the factors that influence a process and all the outcomes, providing a structured approach to analyzing and improving the system [11]. This model serves as the foundational roadmap for the development of KnowHub, ensuring logical progression from initial requirements to the final implementation.

In the Input phase, the study establishes the Knowledge Requirements, which include research on the background of the study and related literature, the definition of project objectives, and collaborative brainstorming through group discussions. It also identifies the necessary Software Requirements, consisting of specific tools for development, and Hardware Requirements, such as the PC or laptop equipment required for system construction. These inputs provide the essential data and tools needed to drive the subsequent development phases.

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The Process phase follows a systematic lifecycle to transform these inputs into a functional digital archive. Here inserts the chosen Agile methodology above with the following phases - Requirements, Design, Development, Testing, Deployment, and Review.

The Output tier presents the successful development and implementation of KnowHub: A Digital Archive of BSIT Resources for Pangasinan State University – Alaminos City Campus. This centralized archive aims to address previous challenges such as resource fragmentation and the lack of monitoring mechanisms by providing a secure, organized, and reliable platform for academic materials. By employing this structured IPO model, the project ensures that all academic resources are preserved and accessible, facilitating a more efficient academic workflow for the BSIT department.

Problems and Proposed Solutions

To figure out the problem of the manual process on accessing resources, the researchers conducted interviews, helping them further understand the current process, and see the areas that needed improvements for better and more effective resource sharing and storing.

However, the current preparation of learning materials at PSU-Alaminos City Campus is an annual routine where instructors gather resources from libraries, online books, and shared drives to update their subject modules. To address these inefficiencies, the proposed KnowHub system will introduce an integrated document editor and an in-house document creator, allowing faculty to create, edit, and collaborate on materials directly within the system. Additionally, the plan includes the development of a version history feature, which is designed to automatically record every revision. This will allow instructors to save the latest changes while preserving older versions for reference, ensuring a transparent record of updates and a more streamlined workflow from initial drafting to final approval.

Currently, faculty members store academic files across a decentralized mix of personal Google Drives and local computer folders, which leads to issues like storage limits and fragmented organization. The proposed system will aim to solve these problems by providing a centralized repository with archiving feature. Under this plan, the system will be designed to preserve files rather than losing when personal storage is full. By establishing a unified platform with role-based access, the project intends to ensure that all BSIT materials are securely backed up, preventing the permanent loss of valuable educational data and facilitating easier retrieval for both faculty and students.

In the existing setup, instructors distribute materials via scattered channels like Google Classroom and Messenger, making it difficult to track if students have successfully accessed the resources. This lack of monitoring, combined with links expiring and unstable internet, often results in students using outdated files. The proposed KnowHub system will address these gaps by centralizing all distribution through a tracking of student views and downloads. The system also propose to incorporate collaborative tools such as discussion threads for interactive learning and a feature where instructors can add comment on a certain file, which will allow faculty to collaborate and suggest edits directly on shared files within the platform. To protect the university's intellectual property, the system is planned to include Automatic PDF Watermarking on all downloaded materials, ensuring that all distributed resources are authenticated and secure.

CONCLUSION

Along with the rapid advancement of the digital landscape in education, continuous innovation in resource management is more than important to be in touch with a modern learning environment and to ensure academic sustainability. The design and development of the KnowHub framework for the BSIT program at Pangasinan State University – Alaminos City Campus that addresses critical challenges faced by both students and faculty illustrates such innovation. By replacing fragmented storage methods with a centralized digital archive, we not only simplify academic workflows but also increase user efficiency.

This platform promotes a more organized approach to information sharing, thereby contributing to the long-term sustainability of the department's institutional knowledge. Beyond just automating file storage, KnowHub

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enhances the overall educational experience in PSU-ACC, making academic materials more accessible and secure. As technology continues to evolve, future improvements could explore AI-driven content organization and advanced security protocols, ensuring that the BSIT department keeps pace with digital innovation in the long run.

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The Proponents

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