

Innovative solutions: Design and implementation of an advanced national service training program (NSTP) portal for state universities and colleges in the Philippines

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ARTICLE INFO

Article history:

Received 21 January 2024

Received in revised form

16 June 2024

Accepted 6 July 2024

Keywords:

Civic welfare training service

Literacy training service

National service training program

Reserve officers' training corps

ABSTRACT

Technology is continually evolving, leading to unexpected breakthroughs, especially evident during the pandemic. The modern era has enhanced the quality of life for many people, and computer programs have transformed how individuals connect with each other and the world. This study aims to develop a National Service Training Program (NSTP) Portal System for the Department of State Universities and Colleges (SUCs) in the region. The researcher used developmental research methodologies, which involve examining, describing, and assessing the product development process. The system's source code was written in PHP, JavaScript, and jQuery, following the Agile Process. MySQL was used to create the system's database, storing all data, records, and information. The study employed developmental research methods to analyze and describe the product development process and evaluate the final product. Additionally, a descriptive research approach was used to gather information through survey questionnaires to assess the system's validity in terms of its features. This evaluation was conducted using a survey instrument based on the ISO/IEC 25010 Software Quality Standards. Department heads, academics, and students were consulted during the data collection for the portal development. The system's creation was successful.

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1. Introduction

National service is more than just "serving the public"; it involves serving under specific political and economic systems, promoting nationalism, and helping to build that nationalism. Various countries around the world implement national service programs (Miller, 2024). These programs can be military, non-military, or compulsory, and some are linked to the educational system, such as the National Service Training Program (NSTP) in the Philippines. These types of national services, integrated into educational institutions, are examples of service-learning. Service-learning combines community service with instruction, allowing students to apply classroom knowledge to real-world situations, thus reinforcing their learning

and enhancing their civic and communal responsibilities. Hands-on participation in community projects is central to service learning.

Research has shown various impacts of service learning on students in different countries. These studies generally found that service learning affects students academically, civically, and socially. Furco's (2002) study, for example, revealed that students engaged in service learning outperformed those who were not, though statistically significant differences were found mainly in academic performance.

The NSTP, mandated by Republic Act No. 9163 (the NSTP Law), aims to develop civic consciousness and defense preparedness among students by promoting service ethics and instilling nationalism and patriotism. The NSTP has three components: (a) Civic Welfare Training Service (CWTS), (b) Literacy Training Service (LTS), and (c) Reserve Officers' Training Corps (ROTC). These components are designed to increase youth participation in national well-being.

The CWTS focuses on activities that benefit society in areas such as health, education, environment, entrepreneurship, safety, recreation, and morality. It emphasizes the importance of youth

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<https://doi.org/10.21833/ijaas.2024.07.013>

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involvement in broad community programs. In contrast, the LTS aims to educate students to teach literacy and numeracy to children, out-of-school youths, and other community members in need. LTS focuses on education, empowering individuals through learning.

The ROTC, though important, has been reduced to one component of the NSTP. Unlike the ROTC, which required male students to undergo four semesters of military training, the NSTP requires both male and female students to participate in one of its programs for two semesters or one academic year.

Students who complete the NSTP program earn three units, 1.5 units per semester. Unlike the previously free ROTC, students now pay for the NSTP. The law allows private educational institutions to offer one of the three NSTP options, while state schools must maintain their ROTC units alongside one other option. The law also stipulates that private and vocational institutions must have 350 cadets to form an ROTC unit, otherwise students may cross-enroll in other schools for their NSTP.

Today, Information Technology (IT) is essential in everyday life. The current situation, which restricts physical movement for safety and health reasons, has made IT indispensable for transactions and business. However, transitioning from traditional face-to-face interactions to technology-based systems requires training, experience, and access to the necessary technology.

2. Literature review

The following studies provide an overview of the relevant literature on the use of portal systems in various fields. Nickles (2007) explored the use of Work Action Analysis (WAA) to determine the requirements for a web-based portal supporting a professional development program. WAA is a cognitive system engineering method for modeling multi-agent systems to aid in design and evaluation. The article presents a WAA model of the professional development program at the Information Technology in Science Center for Teaching and Learning. This model identifies numerous system elements interacted with by different roles within the system, all of which should be supported by the portal. Although the current portal at the center supports some functions, it needs modification or replacement to support all identified functions. This method for developing web portal requirements can be applied to other professional development programs.

The WAA model represents a learning service system in three dimensions: means-end decomposition, parts-whole decomposition, and roles of cognitive agents. It also provides methods for developing and implementing this model in planning and formative evaluation. The WAA method for evaluation planning clearly represents the evaluators' mental model of a learning service system and assesses its alignment to guide design.

This method is then used for formative evaluation, interpreting evaluation measures within the model's context. The procedures for planning and formative evaluation are demonstrated using a component of an undergraduate engineering course. A centralized assessment component, which collects performance, perception, and process measures, was added to an internet-based course management system to provide data for the formative evaluation of a course. The WAA methodologies offer insights into designing and operating this learning service system and provide recommendations for instructional use.

Fuangvut (2005) introduced the concept of a Campus Portal (CP) as an emerging technological innovation in higher education institutions. Many institutions have adopted this concept and are implementing portals to enhance their websites and information systems, supporting institutional stakeholders, especially students. Some literature recommends characteristics and functions for successful CPs, particularly personalization and customization. However, there is little evidence on which core attributes may cause a portal to fail in meeting user requirements for personalization and customization. This paper reports on a CP study and highlights the importance of including personalization and customization in the core functionalities of a portal. These features should be considered in the design and development process and be part of any proposed Campus Portal Development Methodology (CPDM). Fuangvut (2005) also stated that a campus portal is an exciting new development in online services for all stakeholders in higher education institutions. He emphasized that a portal should be different from other web-based applications and the institution's traditional intranet. According to him, the two main features that distinguish a campus portal are (1) personalization, which lets users access only the information and services relevant to their activities, and (2) customization, which allows users to select their preferred information channels and optional online services.

Firestone (2003) discussed the life cycle of a portal server product. This cycle includes the phases of planning, developing, designing, building and testing, deploying, and production. In the planning phase, the organization collaborates with a Sun ONE representative to understand business needs, set objectives, and gather requirements. During the developing phase, the organization creates an overall portal design based on these requirements and deployment estimates.

Once the overall architecture is defined, the organization can start designing, building, and testing the portal. In the deployment phase, the organization installs a trial server instance to test if the portal can handle the user load. If it cannot, adjustments are made, and the trial is tested again. This process continues until the portal is robust and ready for production. Finally, after successful trials and fine-tuning, the organization must develop and

execute a plan to transition the portal from trial to full production.

A portal is a gateway to information and services from various sources, making it easier for users to access content from one or more learning repositories (Manouselis et al., 2009). It includes a database that helps users store, find, and retrieve learning resources, providing centralized access to all relevant network content and applications (Tatnall, 2009). Since the concept of web portals emerged from search engine sites like Yahoo!, Excite, and Lycos, portals have become an essential part of the web and are now very common (Tatnall, 2009). In fact, Bricolo et al. (2007) discovered that web portals are the most visited sites among Italian families.

As technology becomes crucial for effective teaching, academic institutions are promoting and optimizing internet technology for sharing information. The web is increasingly being used as an educational tool by universities (Manouselis et al., 2009). Higher education institutions have developed their own web portals to give the impression of offering convenient services and excelling in Information Technology, which helps attract top students (Manouselis et al., 2009). These innovations are known as educational web portals and serve as gateways to information and services relevant to learning or teaching (Manouselis et al., 2009). For example, the University of the East (UE) in Manila recognizes the power of the Internet and invests its resources to connect globally and support online learning.

To achieve these goals, UE developed its website and a faculty web portal. From their homes, students and teachers can communicate without interruption. Teachers can post lectures, notes, assignments, and even quizzes in advance. Students can download these files and stay informed about the lessons. Teachers can view their academic profiles, check their teaching load for the current semester, and download class lists to verify student enrollment. They can also research online using e-journals and other scholarly works and post students' grades so they can know their class standings. The faculty web portal serves as an access point for various faculty-related activities, including literature review, faculty-student instructional transactions, blogging, student-teacher evaluations, and record keeping.

In an article by Pinho et al. (2022), a quantitative study was conducted using Structural Equation Modelling (SEM) and a questionnaire aimed at teaching and non-teaching staff in Portuguese universities. The study aimed to determine how the use of web portals affects management support and performance in universities, focusing on the quality of information these tools provide. The study highlights the importance of high-quality, up-to-date, and relevant information in university information systems (ISs) for improving decision-making and university performance. A key practical takeaway is the importance of all university departments working together to build ISs. This collaboration

ensures that the ISs meet both individual and collective needs of the university.

In a study by Strauss (2021), it was found that enterprise web portals on campuses and in corporations are changing how people use the web and build web pages. These portals provide quick access to frequently used web pages, services, and other electronic information, like word processors and local network services. Enterprise web portals are designed with the user in mind. Building these portals requires creating a structure and culture that is more challenging than the technical aspects involved. A good definition of a portal is a user-centric, customized, personalized, adaptive desktop (CPAD). The best enterprise portals will include all CPAD features.

According to Mansourvar and Yasin (2010), the development of the web has impacted many aspects of people's lives, including communication, knowledge sharing, job searching, and social activities. A web portal, as a gateway to the World Wide Web (WWW), is often the starting point for Internet users. It functions as a knowledge management system, offering a space for sharing and searching information, as well as providing communication services like free email and content access. Their research aims to understand what universities need from a web portal to help students access necessary information. They conducted a survey to gather students' requirements for developing such a portal.

In recent years, more youths are pursuing higher education to become better qualified and skilled. Acquiring knowledge has become the main goal for university students, as it is essential for making informed decisions, especially in critical situations. Knowledge and knowledge management (KM) are crucial for giving organizations a competitive edge in today's global environment. This is especially true in academic settings, where knowledge is highly valued. KM has become an important topic in campus information technology, with new technologies like the Internet significantly impacting knowledge management and information dissemination in education.

Web portals as knowledge management systems are popular in many organizations, including universities. Universities have led the way in website development, which has evolved into creating web portals to provide comprehensive links to information resources. These portals are important because students need easy access to necessary information online. It's essential for universities to maintain a dynamic connection with students by sharing organized knowledge through the portal and helping them navigate the vast amount of information on the web.

There are various types of web portals with different utilities that benefit users. Each user might have their own definition of a web portal. Simply put, a portal is a gateway to online resources accessible through the intranet, extranet, or internet. This can range from a simple web page to a complex site with

thousands of pages. Early portals were basic, offering a static view of content from a few sources. Generally, a web portal allows users to access information from multiple sources in an integrated way. Besides standard search engines, web portals offer other services such as email, news, stock prices, information, and entertainment, depending on the host institution's focus.

In the study by [Pinho et al. \(2018\)](#), they explored the importance of web portals in Higher Education Institutions (HEIs) as interfaces and communication channels among academic staff. The authors conducted a systematic literature review (SLR) based on various studies to analyze the role of web portals in supporting information management in HEIs. They identified four main themes: (1) software used in web portals, (2) internal and external benefits, (3) technology acceptance, and (4) information management and storage. The study found a lack of scientific articles specific to HEIs' needs and highlighted the importance of web portals in decision-making. It also suggested future research directions based on the identified gaps.

[Tolentino \(2011\)](#) studied the use of university web portals for information management. Her research aimed to explore faculty acceptance of web portals as teaching tools and identify key factors influencing their use at UE. With 40 faculty respondents from six colleges, the findings showed a positive attitude toward the portal due to its usefulness and ease of use. Faculty members intended to continue using the portal for information management. The study confirmed that perceived usefulness (PU) is a key determinant for ongoing use of the portal.

[Presley and Presley \(2009\)](#) noted that HEIs increasingly use web portals to connect with students, providing a centralized access point for information and services. Despite significant efforts, student use of these portals can be disappointing. Their study used the Technology Acceptance Model (TAM) and added constructs like compatibility and enjoyment to understand portal acceptance and use. A survey of 709 students showed that ease of use, perceived usefulness, and enjoyment significantly influenced portal use.

[Fuangvut \(2005\)](#) highlighted that campus portals are part of a new generation of online services for higher education. The study focused on developing a methodology for campus portal projects, emphasizing personalization and customization. These features allow users to access relevant information and select preferred services. The research included preliminary and case studies to understand the design and implementation of campus portals better. The findings contributed to a proposed Campus Portal Development Methodology (CPDM).

[Popovic et al. \(2005\)](#) discussed the challenges of introducing e-learning in HEIs, which include technological and cultural obstacles. They emphasized the benefits of e-learning, such as cost-effectiveness and flexible accessibility, but noted

issues with the efficiency and usefulness of these solutions. Their study at the University of Ljubljana demonstrated that cultural changes in education take time.

[Oliha \(2021\)](#) evaluated the role of social-academic platforms in enhancing collaborative learning and increasing the use of academic web portals. The study used the System Usability Scale (SUS) to assess the usability of such platforms. The results showed high usability and adaptability, suggesting these platforms can foster interactions between lecturers and students, especially during the pandemic.

The literature on knowledge management (KM) distinguishes between information and actionable knowledge. [Jessy et al. \(2016\)](#) highlighted the role of web portals in knowledge sharing and management in academic settings. These portals support the transfer, storage, retrieval, creation, integration, and application of knowledge.

[Allifya et al. \(2022\)](#) focused on designing an accessibility portal for higher education institutions, using Design Thinking to create a user-friendly platform for information on disability and accessibility. Their solution at Brawijaya University achieved high effectiveness and ease of use.

These studies collectively enhance the understanding of how web portals can be used as KM tools in academic libraries, proposing a framework for their design and implementation to improve knowledge sharing and management in academic institutions.

3. Research methods

Using the Agile approach, the researchers planned and defined the project's needs by gathering relevant data and outlining the project scope for each idea. Once they confirmed the project's feasibility, they set up and prepared the working environments. They then started the design and development of the NSTP portal. After completing the system, they conducted all necessary testing and documentation and deployed it for end-user testing and assessment. Following the testing phase, they made enhancements to the system. Several respondents were involved in assessing the system's usability and user acceptance. These respondents included five IT practitioners, seven permanent NSTP personnel, five regular NSTP faculty members, and five hundred NSTP students from the Nueva Ecija University of Science and Technology (NEUST), as shown in [Table 1](#).

Table 1: Distribution of the respondents

Respondents	Number of	Percentage
IT experts	5	0.97%
NSTP permanent	7	1.35%
NSTP regular faculty	5	0.97%
NSTP students	500	96.71%
Total	517	100%

Respondents were asked to complete an online survey using Google Forms. Their role was to

evaluate the system's quality based on the ISO/IEC 25010 Software Quality Criteria and its effectiveness.

The following outlines the procedures the researchers followed to achieve the study's results. During the planning phase, they conducted several interviews with relevant offices and target end-users to understand the distribution and monitoring processes. This helped them identify the drawbacks of the manual approach. Using data from these interviews, they listed the features and capabilities needed for the proposed system. They also created a task list and timeline for the development stages, which are shown in the Gantt chart in the next section.

Once planning and scheduling were complete, they began creating the front-end and back-end components of the system. Various data models and diagrams were used as blueprints for the portal. For example, data normalization was employed to eliminate duplicates and define relationships between fields and tables. A data dictionary was created to specify data types and field lengths. An entity-relationship diagram (ERD) illustrated the connections between the tables used in the system. During development, the researchers wrote the

source code in PHP, JavaScript, and jQuery. The database, which stores all the system's data, records, and information, was built using MySQL.

In the testing phase, the system was set up on several personal computers in the NSTP office to test its appearance and performance in different contexts. The system underwent performance testing, system flow testing, error testing, and typographical testing to identify and address any issues. By the time the final version was released, all errors and flaws had been resolved.

Once the enhanced system was ready, the researchers installed the web portal on computers in the targeted offices and trained users on how to use it. After more than a week of usage, users were asked to evaluate the system using the ISO/IEC 25010 Software Product Quality Standards criteria.

The evaluation results were used to make further adjustments to the system based on user feedback.

The study's framework, shown in Fig. 1, guided the researchers in designing and developing the NSTP portal for the Nueva Ecija University of Science and Technology (NEUST). It outlines the system's requirements and the research processes followed.

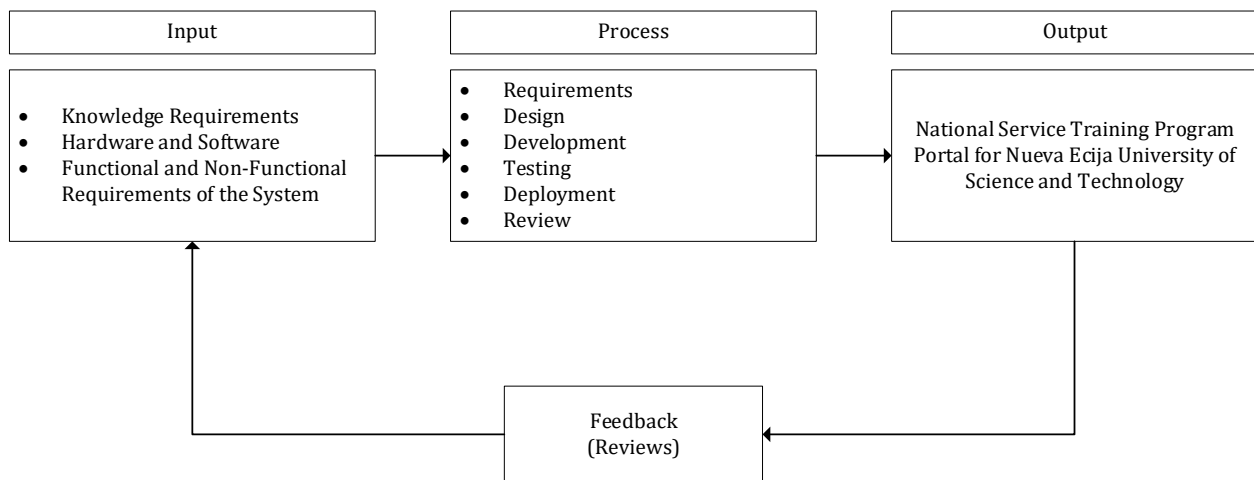


Fig. 1: Paradigm of the study

The Agile software development model was used. Agile is a cyclic and iterative approach to software development and project management that emphasizes flexibility, collaboration, and customer satisfaction. It starts with the Requirements phase, where the needs and expectations of stakeholders are identified and documented. Next is the Design phase, where the system architecture and design specifications are created based on the requirements. The Develop phase follows, involving actual coding and software implementation. Once development is done, the Test phase focuses on finding and fixing bugs to ensure the software works correctly. After testing, the Deploy phase releases the software to users. The final phase is Review, where feedback from users and stakeholders is collected, leading to potential adjustments and enhancements. This feedback is then used to update the requirements, continuing the cycle of continuous improvement and adaptation to changing needs.

Using this model, the NSTP portal was developed. For each development stage, the verification and validation model included a testing process to ensure that each sprint met the requirements and specifications for the relevant department's transactional flow. The scope and high-level functionalities of the NSTP Portal System are shown in Fig. 2, which illustrates the interactions between the system and its users. Four types of users will use this portal: students, instructors, academic heads, and system administrators. Each user has different roles and levels of authority in the system. Students can log in, upload, and view important announcements and documents. Instructors can log in, make requests, and create and send class codes. The academic head can monitor the progress of teachers and students enrolled in the course. The administrator can approve requests and generate reports.

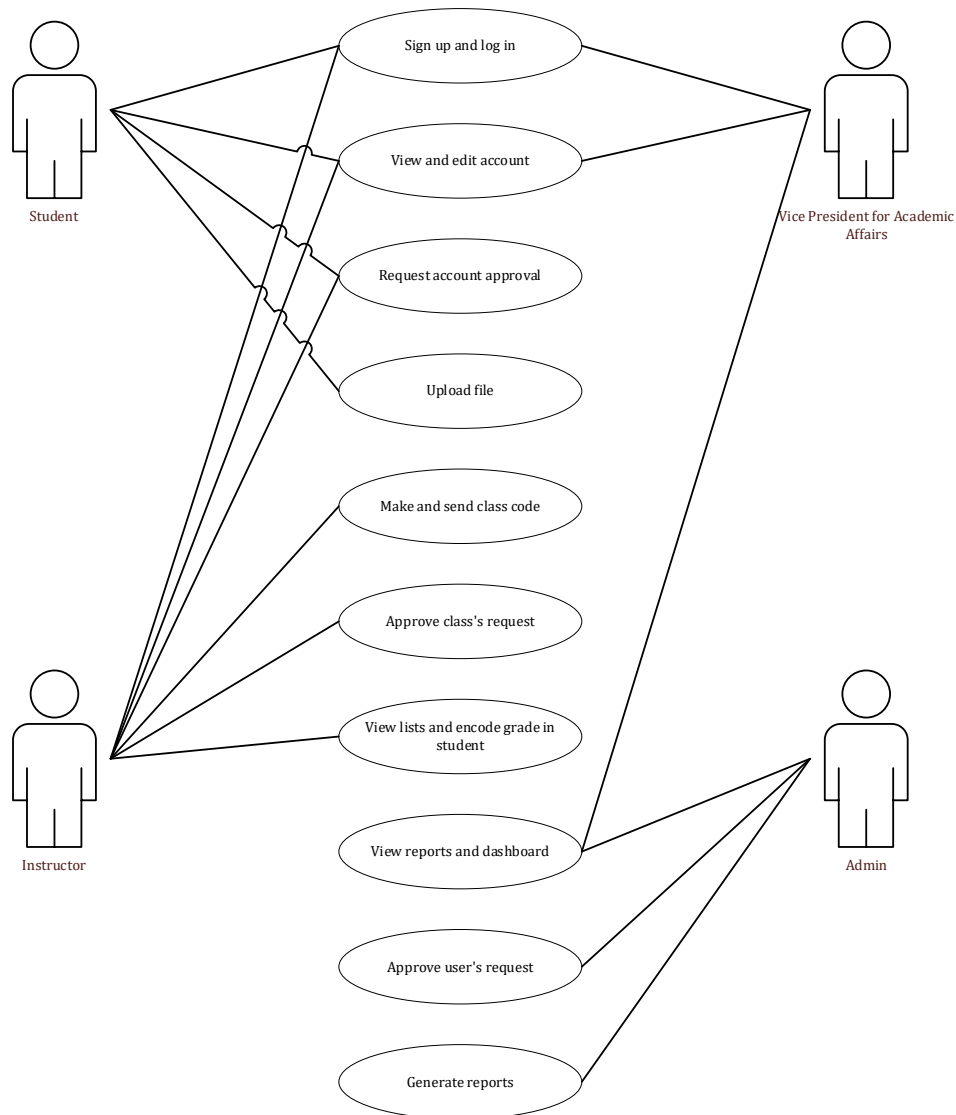


Fig. 2: Use case diagram NSTP portal

4. Results and discussions

Table 2 summarizes the evaluation by NSTP teachers, personnel, and students regarding the functional suitability, performance efficiency, and usability of the proposed portal.

The evaluation results indicate that NSTP personnel, faculty, and students are ready to adopt the NSTP Portal. They found the system highly functional, efficient, and user-friendly. This suggests that the system effectively meets their needs, and they support its adoption for tracking activities.

In 2015, Kunming University of Science and Technology published an article titled "Research and Implementation of App Software Product Quality Attribute Measurement Method." The author stated that normal requirement functions are those specified in the requirements, while desired functions are implicit needs that are not initially demanded but necessary for optimal app performance. Exciting functional requirements address both current and future user needs, significantly improving user satisfaction. Software functional integrity cannot be measured only by implemented and unimplemented features; meeting

both normal and expected requirements ensures high user satisfaction (Wimalasooriya et al., 2022).

High-performance system design goes beyond speed and efficiency, encompassing reliability, maintainability, and scalability. These systems must balance performance, functionality, and user experience, adapting to changing demands without compromising quality. High-performance systems enhance user engagement, operational efficiency, and organizational competitiveness (Pazienza et al., 2024).

Oliha (2021) evaluated a social-academic platform's usability in fostering collaborative learning and increasing academic web portal usage. The absence of social and academic features in the studied platforms led to usability issues and reduced interaction between tutors and students. The coronavirus pandemic highlighted the importance of web portals for alternative learning. Oliha used the System Usability Scale (SUS) to assess portal usability and validate social learning and knowledge sharing. The evaluation showed a learnability score of 70.9% and a usability score of 83.9%, indicating excellent usability. The study suggests that social academic web portals are adaptable and can enhance

interactions between lecturers and students during the pandemic.

Recent growth in digital materials has transformed educational institutions, leading to virtual learning environments. Schools have implemented various digital programs, but aggregating data from different sources has become challenging. Sharma et al. (2020) argued for a centralized web portal to streamline tasks and improve the overall student experience by providing a single access point to all system capabilities.

Kazi et al. (2022) emphasized effective web portal design in "User Experience Design of University Schools' Web Portals." They highlighted the importance of web portals in enhancing information services for students and stakeholders. Pandey et al. (2023) examined web portal effectiveness in academic institutions, focusing on technology, user perspectives, and compatibility.

They provided insights and recommendations for improving functionality and user experience.

Gupta et al. (2024) discussed the Kconnect web portal's design and development, aimed at enhancing campus community collaboration and communication. They addressed challenges like the lack of peer interaction due to remote work during the pandemic, offering a solution to bridge communication gaps and provide relevant information about career opportunities, scholarships, club activities, and higher studies. These studies highlight the crucial role of well-designed web portals in facilitating effective communication, collaboration, and information exchange within academic institutions.

The respondents also evaluated the portal's main functions in terms of its contents and report generation activities. Table 3 summarizes the significant findings related to these components.

Table 2: Summary of evaluation of the NSTP portal by the NSTP personnel, faculty, and students

Software product quality categories	Weighted mean	Verbal description
1. Functional suitability	3.49	Very functional
2. Performance efficiency	3.33	Very efficient
3. Usability	3.84	Very usable
Average weighted mean	3.55	Very functional, very efficient, and very usable

Table 3: Summary of evaluation based on main functions of the system by the end-users with regards to perceptions on the needed contents of the NSTP Portal

Item Statements	Weighted mean	Verbal description
1. Display the goals of the NSTP department and of the University	3.80	Much advantage
2. Contain enrolment statistics per component, i.e., LTS, CWTS, ROTC	3.80	Much advantage
3. Store students' personal information and contact details	3.70	Much advantage
4. Keep the records of the different activities conducted by the NSTP Department	3.70	Much advantage
5. Generate various types of reports for internal and external consumption.	3.80	Much advantage
6. Navigation labels are clear and brief	3.70	Much advantage
7. Make page titles explanatory	3.60	Much advantage
8. Maintain styles and colors consistent	3.60	Much advantage
9. Make site search easy to access	3.80	Much advantage
Average weighted mean	3.72	Much advantage

After using the NSTP Portal, the NSTP personnel, faculty, and students evaluated its main functions and content. With an average score of 3.72, the results show that the Portal System provides a single access point to information and personalized details like student and teacher profiles. It enhances information sharing, improves interactions among stakeholders, provides better control over daily processes, and is easily accessible on desktops and mobile devices such as smartphones and tablets.

The NSTP Portal also ensures data security with measures like password protection and different user access levels. This has led to a score of 3.70 for the secure storage of student contact information and records of NSTP activities, indicating that all portal records are well-protected.

Eboueya and Uden (2007) found that a portal's success depends on its perceived benefits to the university or community, whether for recognition, operational efficiency, productivity gains, or cost savings. Ideally, every university member should benefit from the portal, making their roles easier and more efficient. Portals improve productivity by speeding up and customizing information delivery to internal and external users, similar to groupware applications. They also help manage information

overload in an organized manner, serving as a technical solution, though not a complete answer, to knowledge management.

University portals can establish long-term relationships with the institution by facilitating business interactions and collaboration among students, faculty, staff, and alumni with similar needs and interests. When properly implemented, portals can be a strategic asset, offering more than traditional static websites. They provide clear benefits to students, faculty, staff, and external stakeholders.

After implementing the NSTP Portal for nearly two weeks, NSTP personnel, faculty, and students evaluated its effectiveness. Table 4 summarizes the evaluation results of the portal's effectiveness during this period.

After using the NSTP Portal, NSTP personnel, faculty, and students evaluated its effectiveness over four weeks. The evaluation used six-item statements, resulting in an average score of 3.64, indicating the portal is "Very Effective." This score shows that the system meets all essential user requirements. The statement "provides publishing of graduates" received the highest score of 3.80, also rated as "Very Effective."

Table 4: Summary of evaluation on the level of effectiveness of the NSTP portal

	Weighted mean	Verbal description
1. Is easy to use	3.60	Very effective
2. Has aesthetic design	3.48	Very effective
3. Provides publishing of graduates	3.80	Very effective
4. Caters the uploading, viewing, updating, and printing CSV	3.76	Very effective
5. Has all the necessary functions for collecting and consolidating graduates	3.70	Very effective
6. Caters to the evaluation of faculty's performance	3.50	Very effective
Average weighted mean	3.64	Very effective

Similarly, Masrek (2007) found that the effectiveness of information systems (IS), including service quality and system quality, is strongly linked to user satisfaction. His study highlighted that user attitudes toward the portal significantly correlate with IS effectiveness. However, the study's reliance on self-reported measures and a single point in time for data collection could introduce bias. Despite the increasing use of portal technologies in universities, research on their success and effectiveness remains limited, emphasizing the need to evaluate portals from the user's perspective.

Technology has advanced rapidly in the 20th and 21st centuries, especially during the pandemic, enhancing communication and improving quality of life. Motivated to support youth and assist the government, researchers developed the NSTP Portal to streamline data processing required by the Commission on Higher Education. This system ensures secure, organized, and accessible data management for NSTP graduates, complying with CMO 27 series of 2015 guidelines.

Aligned with the University's mission of "Transforming Communities through Science and Technology," the NSTP is working diligently to meet these goals. The NSTP's record management system, though organized and ISO-certified, needed a more efficient system to manage vital records and serve clients effectively.

The NSTP Portal for State Colleges and Universities (SUCs), initially designed for NSTP-NEUST, meets the ISO/IEC 25010 Software Product Quality Standards. These standards include functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability, as confirmed by IT experts, NSTP personnel, faculty, and students.

The portal received high evaluation scores and approval from respondents, indicating it meets the technical and record management requirements of the NSTP Department.

5. Conclusions

Based on the significant findings, the following conclusions were drawn:

1. The NSTP Portal for Nueva Ecija University of Science and Technology (NSTP Portal) was successfully developed based on the different phases of the Agile Methodology of the System Development Life Cycle using the following phases: Planning, designing, coding, testing, deployment, review.

2. The NSTP portal is compliant with the requirements specified in the ISO/IEC 25010 Software Product Quality Standards evidenced by the ratings conforming to as Highly Functional, Highly Efficient, Highly Compatible, Highly Usable, Highly Reliable, Highly Secured, Highly Maintainable, Highly Portable, and Highly Effective given by the IT Experts.
3. The end-users' qualitative ratings of Very Functional, Very Efficient, and Very Usable for the three chosen categories of Functional Suitability, Performance Efficiency, and Usability show that they are prepared to embrace and incorporate the system into their processes and workflow of transactions.
4. The portal got a high level of evaluation and approval from the respondents. It means that the system meets the technical requirements for a web portal that the NSTP Department needs as well as those for a record-oriented file system.

Compliance with ethical standards

Ethical considerations

This study adhered to ethical guidelines and regulations. Informed consent was obtained from all participants, and their data were anonymized to ensure privacy. The study received ethical approval from the Nueva Ecija University of Science and Technology Institutional Review Board.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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