Design and Development of Institutional Scientific Publications, Innovation, and Research Management System (INSPIRE-MS) with Descriptive Analytics for the Digitalization of University Research Management Processes

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Design and Development of Institutional Scientific Publications, Innovation, and Research Management System (INSPIRE-MS) with Descriptive Analytics for the Digitalization of University Research Management Processes

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Abstract: *The Institutional Scientific Publications, Innovation, and Research Management System (INSPIRE-MS) was developed to streamline research, innovation, publication, and analytics processes at NISU. Using an Agile methodology, the system was designed iteratively to address institutional needs and improve operational efficiency. INSPIRE-MS comprises four core modules: the Research Module, Innovation Module, Publication Module, and Utility and Analytics Module. The Research Module manages activities such as proposals, presentations, awards, and linkages. The Innovation Module supports patent, copyright, utility model, and industrial design management. The Publication Module focuses on publication and citation management, enabling effective tracking and assessment of scholarly outputs. The Analytics Module transforms data into actionable insights through a dashboard with cards and charts, empowering stakeholders to monitor progress and make informed decisions. The system's user-friendly design, coupled with features like user management and profile settings, facilitates seamless interaction and personalization. A comprehensive testing and integration process ensured the modules functioned cohesively, culminating in deployment at the Office of Research and Development Services. INSPIRE-MS demonstrates the potential of integrated information systems in enhancing efficiency and supporting data-driven strategies. Future studies could focus on extending its capabilities to include an Extension Services Module and expanding implementation to other institutions.*

Keywords: digitalization, INSPIRE-MS, innovation, research management system, technology innovation

1. INTRODUCTION

Research and innovation play a crucial role in driving societal progress [1], with higher education institutions at the forefront of generating new knowledge and solutions to global challenges [2], [3]. As the complexity and scale of research activities grow, the need for systematic management and effective coordination becomes increasingly apparent. Institutions must manage not only the research process itself but also the associated data, documentation, and compliance requirements, which are critical for transparency, accountability, and reproducibility of research outcomes [4], [5]. This has led to the growing demand for integrated research management systems that can streamline these processes. Clear communication and coordination are essential for meeting deadlines and achieving research goals. However, managing research data has become a challenge for many universities [6]. Without a centralized system and standardized processes, information often becomes disorganized, efforts are duplicated, and tracking progress is difficult. These challenges highlight the importance of tools that can streamline and improve the management of research projects. [4], [7].

At Northern Iloilo State University (NISU) in Estancia, Iloilo, Philippines, close to a hundred research projects are completed every year, but problems are encountered not only by the research staff but also by the researchers themselves. One of the major difficulties is the preparation of reports for accreditation endeavors, which often requires extensive data retrieval. This issue highlights the lack of a streamlined system, making it challenging to access and compile the necessary information. Such problems are not limited to accreditation but also affect other administrative processes, increasing the workload for everyone involved. Furthermore, NISU faces a multitude of difficulties when managing research activities, especially given the scale and complexity of projects across its different campuses. Numerous research projects are conducted annually, each with specific needs for tracking, documenting, and adhering to compliance standards. The diversity of these projects adds layers of complexity, as different types of research may have varying requirements for documentation, approvals, and progress reports. Ensuring consistency, avoiding data duplication, and meeting all compliance standards can be challenging without a centralized, well-organized management system.

As research outputs become increasingly digitized, institutions like NISU face the challenge of managing large volumes of data while ensuring accessibility and long-term preservation. In many cases, paper forms are still commonly used for data collection, but they are costly to produce, distribute, store, and archive. Paper records are also prone to being lost or damaged and are difficult to duplicate [8]. This highlights the growing need for research offices to adopt modern solutions that facilitate efficient data management and archiving. Additionally, they must track the impact of research outputs, such as publications and innovations, and effectively report results to stakeholders. Meeting these demands requires robust systems that streamline data management, document activities, and simplify reporting processes. Comprehensive tools, such as an integrated information system, are essential for enhancing efficiency and ensuring that research operations align with institutional goals. [9], [10].

With the aforementioned challenges and opportunities, this paper presents the design and development of a web-based application entitled Institutional Scientific Publications, Innovation, and Research Management System or INSPIRE-MS. Specifically, INSPIRE-MS aims to provide a centralized platform for managing research proposals, projects, activities, publications, and innovations to enable data-driven decision-making. The system aims to streamline workflows for research personnel and researchers, leading to improved efficiency and productivity.

The objectives of INSPIRE-MS are multifaceted. The system is designed to enhance the efficiency of research management by offering a streamlined, web-based interface for handling all aspects of research activities and data. By reducing the administrative burden on research personnel and providing robust tools for data management, documentation, and reporting, INSPIRE-MS seeks to improve both the quality and visibility of research at the university. Additionally, the system offers descriptive analytics to help administrators make informed decisions regarding resource allocation and strategic planning, further improving the operational efficiency of research offices in the university, for its digitalization process[11].

2. METHODOLOGY

The development of INSPIRE-MS is envisioned as a significant step toward future-ready research management. By supporting the entire lifecycle of research projects, from proposal to publication, INSPIRE-MS aims to cultivate a culture of innovation and knowledge dissemination, helping NISU achieve its goals in becoming a research university.

The development of INSPIRE-MS employed the Agile methodology, emphasizing iterative progress, collaboration, and flexibility. Agile was chosen due to its suitability for projects that require ongoing stakeholder feedback and evolving requirements, particularly in a dynamic environment like research management. The development process used short iterations, known as sprints, to produce incremental improvements in the system. This iterative approach allowed adaptation to changing needs and effective incorporation of user feedback.

2.1 Requirement Gathering and Planning

The process started with gathering requirements. Representatives from the Research and Development Services (RDS) Office, the Scientific Publications (SP) Office, and the Knowledge Management Innovation and Technology Transfer (KMITT) Office were interviewed in a series of sessions to understand their challenges and needs with the status quo. This information was used to define user stories, which are concise descriptions of the desired functionalities from the perspective of the users. Based on these user stories, a prioritized backlog of features was created for implementation. Planning involved breaking down the requirements into manageable tasks that could be completed during each sprint.

Building upon this structured process, Fig. 1 illustrates the conceptual framework of INSPIRE-MS. The framework highlights the integration of three core modules Research Module, Innovation Module, and Publication Module designed to streamline processes and enhance productivity in research, innovation, and publication management. These modules are supported by reports and analytics tools to provide actionable insights for decision-making.The framework emphasizes the collaboration between researchers, unit heads, and personnel in utilizing the system to achieve institutional goals.

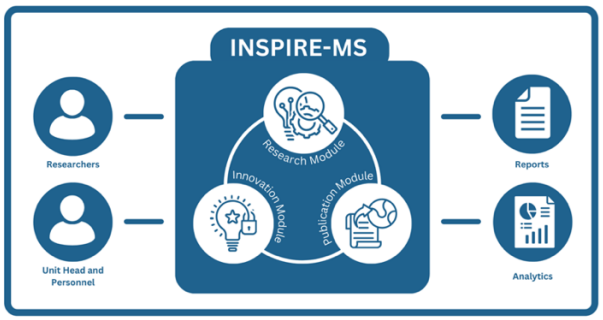

Fig. 1. Conceptual Framework

The conceptual framework of INSPIRE-MS laid the groundwork for understanding the system's core functionalities and how they address institutional needs. To bring this vision to life, the planning and development process required a robust technical infrastructure capable of supporting the system's modules and ensuring seamless user interactions.

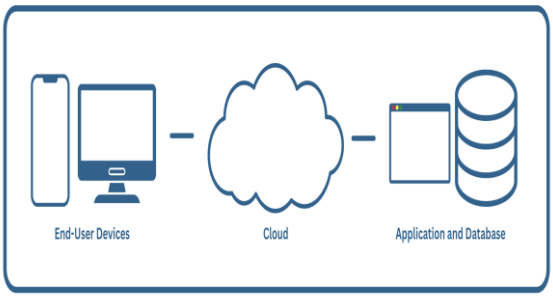

Fig. 2. Architecture Design.

To further translate this conceptual framework into a functional system, the architecture design, as illustrated in Fig. 2, consists of three main layers: end-user layer, cloud layer, and the application layer. End-user devices, such as mobile phones and desktop computers, serve as the primary interface for users to access the system. These devices communicate with the cloud, which acts as the central hub for processing requests and managing data flows. The cloud infrastructure hosts the application logic and ensures seamless connectivity between the user interface and the back-end. Finally, the application layer is integrated with a database that securely stores and retrieves data for efficient system operations. This design emphasizes scalability, reliability, and user accessibility, ensuring that the system can handle a variety of user needs and workloads efficiently.

2.2 Sprint Cycle and Development

The development of INSPIRE-MS was structured into five sprints, each focusing on a specific module or system component. The sprints were designed to last three to four weeks, depending on the complexity of the tasks. The process prioritized incremental development,

stakeholder feedback, and iterative refinement. The table below outlines the sprint plan for the Research Module, Innovation Module, Scientific Publication Module, Utility and Analytics Module and the Integrated System. The first sprint focused on the Research Module, aiming to develop features for managing research activities such as project proposals, progress tracking, and report generation. This involved designing a research database, creating user interfaces for proposal submission, and integrating monitoring tools.

The second sprint developed the Innovation Module, which supported managing innovation concepts through submission, evaluation, and implementation workflows. Tools for progress tracking and reporting were also included. The third sprint addressed the Scientific Publication Module, focusing on processes for manuscript submission, review, and tracking publication stages. This module also incorporated publication analytics to monitor impact. The fourth sprint built the Utility and Analytics Module, providing system-wide utilities such as user management, notification services, and dashboards for visualizing data insights.

The final sprint focused on the Integrated System, combining all modules into a unified platform. This included testing data flow, optimizing performance, and conducting end-to-end system validation. Each sprint concluded with testing, feedback collection, and refinement to ensure alignment with user requirements. The summary of sprints and their respective objectives, activities, and deliverables is presented in Table 1.

Table 1. Sprint Plan and Summary of Activities

Sprint	Module	Objective	Key Activities	Deliverable
Sprint 1	Research Module	Develop tools for managing research activities.	Design database, create interfaces for proposals, integrate monitoring tools, and perform unit testing.	Functional Research Module
Sprint 2	Innovation Module	Create features for managing innovation concepts and workflows.	Develop submission and evaluation tools, design tracking workflows, implement reporting mechanisms, and conduct initial testing.	Prototype of Innovation Module
Sprint 3	Scientific Publication Module	Streamline processes for managing scientific publications.	Create manuscript submission and review interfaces, develop publication tracking systems, integrate analytics, and test functionality.	Working Scientific Publication Module
Sprint 4	Utility and Analytics Module	Provide tools for utilities and data analytics to support decision-making.	Design dashboards, implement analytics tools, develop user management and notifications, and perform comprehensive testing.	Utility and Analytics Module
Sprint 5	Integrated System	Combine modules into a unified platform and ensure interoperability.	Merge modules, test data flow, optimize performance, conduct end-to-end testing, and collect stakeholder feedback.	Fully integrated system ready for deployment

2.3 Testing and Integration

An essential aspect of the Agile methodology in the development of INSPIRE-MS was the implementation of continuous testing and integration throughout the entire process. Each feature within the system, whether part of the Research, Innovation, or Publication modules, was rigorously tested during its development to ensure it met the specific requirements identified during the planning phase. This included unit testing to validate individual functionalities within each module, integration testing to verify that the modules worked cohesively as part of the larger system, and user acceptance testing to ensure alignment with the expectations of researchers, unit heads, and personnel. Continuous integration played a critical role in facilitating seamless interactions between the system's components, such as the reports and analytics tools, while minimizing the risk of errors or inconsistencies as new features were incorporated. This iterative testing and integration process ensured that INSPIRE-MS operated reliably and effectively, meeting institutional goals and stakeholder needs.

2.4 Deployment and Feedback

After each sprint in the development of INSPIRE-MS, a deployable version of the system was made available for stakeholders to review. This iterative approach allowed end-users, such as researchers, unit heads, and personnel, to test the system in real-world scenarios and provide valuable feedback. The feedback gathered was instrumental in making necessary adjustments and improvements during subsequent sprints, ensuring that the system evolved to meet user needs and provided an intuitive, user-friendly experience.

Once all core components Research Module, Innovation Module, Publication Module, as well as Utility and Analytics tools were fully developed and refined, they were integrated into a single, cohesive system. This integration ensured seamless functionality across all modules, with robust analytics and utility features supporting data-driven decision-making and process optimization. The final version of INSPIRE-MS was

deployed at the Office of Research and Development Services, where it became fully operational to streamline research, innovation, publication, and analytics processes. This deployment marked the successful completion of an iterative, feedback-driven development cycle that aligned the system's capabilities with institutional objectives.

2.5 Review and Retrospective

At the end of each sprint cycle during the development of INSPIRE-MS, a review and retrospective meeting was conducted. The review session focused on demonstrating the completed functionalities of the system to stakeholders, including researchers, unit heads, and personnel, to gather feedback and ensure that the deliverables aligned with their expectations. For example, stakeholders were presented with updates to the Research, Innovation, Publication, or Utility and Analytics modules, allowing them to test and evaluate the new features in real-world contexts.

The retrospective session, on the other hand, involved the development team reflecting on the sprint process to assess what went well, what challenges were encountered, and how to improve in the next iteration. This reflective practice helped identify areas such as time management, resource allocation, or testing strategies that required adjustment. By combining stakeholder feedback and internal reflections, the process ensured continuous enhancement of both the system and the workflow, ultimately leading to a more robust and user-centered final product.

3. RESULTS AND DISCUSSION

The development and deployment of the Integrated System for Process Innovation in Research and Extension (INSPIRE-MS) achieved significant milestones, as outlined in the sprint plan and activities. Each sprint successfully delivered functional modules that addressed specific institutional needs, culminating in a unified system that supports research, innovation, publication, and analytics processes.

3.1 Research Module

The Research Module was the first to be completed, offering comprehensive tools to manage various aspects of research activities. These include project proposals, progress tracking, reporting, presentations, utilization, awards, linkages, and calls for papers. The module introduced streamlined workflows and user-friendly interfaces, enabling efficient handling of submissions, monitoring progress, and managing associated activities such as research presentations and linkages. This enhanced the overall organization and efficiency of research processes. Fig. 3 shows a sample screenshot of one of the pages under the research module.

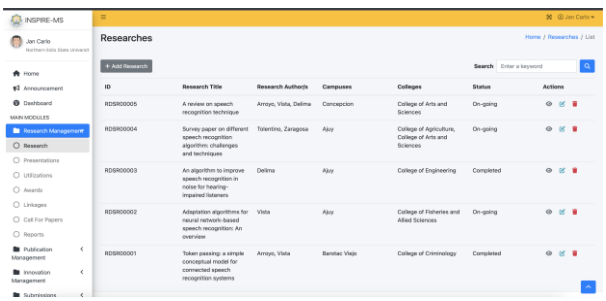

Fig. 3. Research Management

3.2 Innovation Module

The Innovation Module provided features for patent management, utility model management, copyright management, and industrial design management. These features allowed for efficient oversight of intellectual property assets and ensured proper documentation and tracking throughout the lifecycle of each innovation. With robust tracking tools and detailed reporting mechanisms, the module facilitated effective monitoring of project status and progress, promoting a more organized and transparent process for handling innovation outputs. This design enhanced the institution's ability to manage and protect its intellectual property while aligning innovation efforts with strategic goals. Fig. 4 shows a sample screenshot of patent management page under the innovation module.

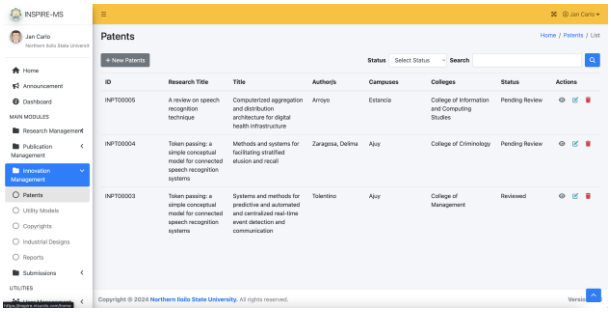

Fig. 4. Patent Management

3.3 Publication Module

The Publication Module offered comprehensive tools to support the efficient management of scholarly outputs, including publication management and citation management. It enabled researchers to systematically organize and track their published works and citations. Integrated analytics tools offered valuable insights into publication performance and impact, helping researchers better understand the reach and influence of their work. These features streamlined workflows, reduced administrative burdens, and promoted a more organized approach to managing and assessing scholarly outputs. Fig. 5 shows a sample screenshot of one of the pages under the publication module.

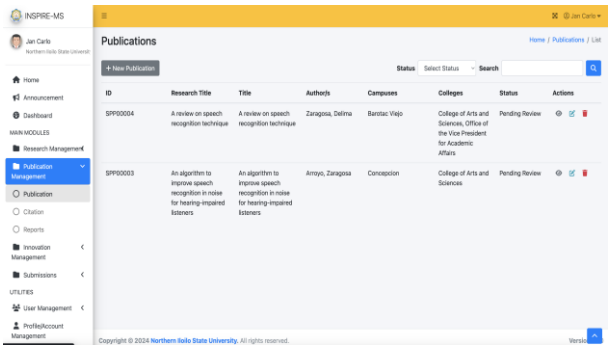

Fig. 5. Publications Management

3.4 Utility Module

The Utility Module served as the backbone of INSPIRE-MS, providing essential tools for user account management and personalization. Features such as account settings, personal information management, and an author profile system ensured a tailored experience for each user. Account settings allowed users to update their credentials and preferences, while the personal

information management tool enabled seamless handling of user-specific data. The author profile feature was particularly beneficial for researchers, as it allowed them to maintain a comprehensive record of their publications and contributions. This module enhanced usability and efficiency by giving users greater control over their accounts and professional data. Fig. 6 illustrates the User Management feature within the Utility Module, and Fig. 7 displays the Profile/Account Settings page for users.

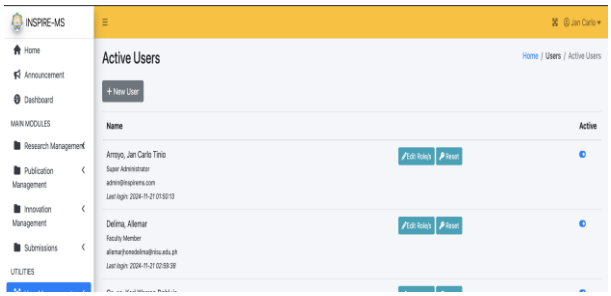

Fig. 6. User Management

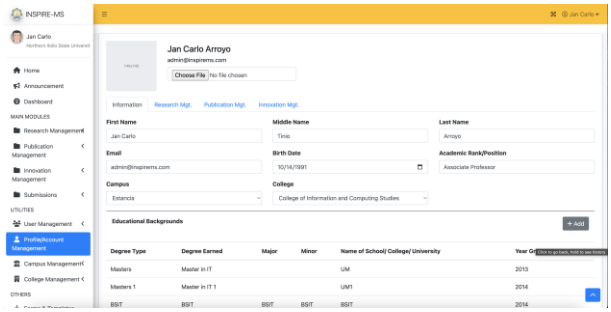

Fig. 7. Profile/Account Management

3.5 Analytics Module

The Analytics Module played a pivotal role in transforming data into actionable insights through a comprehensive dashboard. The dashboard featured intuitive cards and charts that provided an overview of key metrics, such as research project statuses, innovation outputs, and publication impact. The cards offered quick summaries of essential data points, while the charts provided visual representations of trends and patterns, making complex data more accessible. Stakeholders appreciated the clarity and interactivity of the dashboard, which empowered them to monitor progress, identify areas for improvement, and make informed decisions based on real-time analytics. This module elevated the system's capability to support data-driven strategies within the institution. Fig. 8 and 9 illustrate the two main components of the dashboard: the cards, which provide quick summaries of key data points, and the charts, which offer visual representations of trends and patterns.

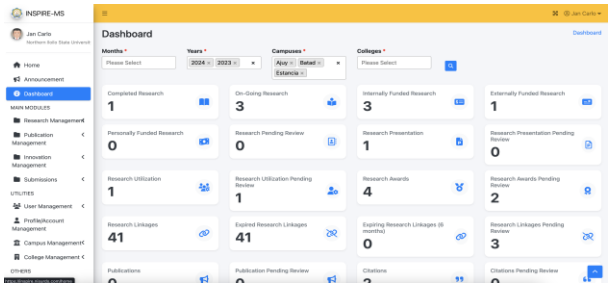

Fig. 8. Dashboard Cards


Fig. 9. Dashboard Charts

3.6 Integrated Module

The final sprint merged all modules into a cohesive platform, ensuring interoperability and seamless data flow between components. Comprehensive testing validated the functionality and reliability of the integrated system. Stakeholders were satisfied with the system's performance during deployment at the Office of Research and Development Services, where it became fully operational.

The successful development of INSPIRE-MS highlights the effectiveness of adopting Agile methodology in creating a system that evolves based on stakeholder feedback and institutional requirements. The iterative nature of sprints allowed the development team to address challenges dynamically, refine workflows, and incorporate improvements consistently. This approach ensured that the system aligned closely with the needs of researchers, unit heads, and personnel.

The results demonstrate the value of focusing on modular development. Each module contributed distinct functionalities, addressing specific areas of research management while maintaining flexibility for future enhancements. For example, the Research Module streamlined submission and monitoring, the Innovation Module fostered a systematic approach to idea management, and the Publication Module supported efficient and transparent publication processes. Together, these modules, enhanced by the Utility and Analytics tools, formed a comprehensive system capable of supporting the institution’s goal of becoming a research university.

The deployment phase revealed that continuous testing and integration were critical in ensuring system reliability. Stakeholders expressed satisfaction with the system’s usability and the accessibility of its features, particularly the dashboards and reporting tools that enhanced their ability to make informed decisions. Furthermore, the integration of all modules into a single platform eliminated silos, providing a unified system for managing processes seamlessly.

Challenges encountered during development, such as balancing user expectations with technical constraints, were addressed effectively through sprint retrospectives and stakeholder engagement. These reflections fostered a culture of continuous improvement, ensuring that both the system and the workflow remained adaptive and responsive.

INSPIRE-MS not only met its initial objectives but also provided a foundation for future scalability. The modular architecture and feedback-driven approach ensure that the system can evolve to meet emerging institutional needs, making it a future-ready solution for research management. The integration of analytics tools positions the system as a key enabler of data-driven decision-

making, further strengthening its role in supporting institutional goals

3.7 System Evaluation

The usability of the INSPIRE-MS was evaluated using the ISO/IEC 25010 model. The system was evaluated by the 13 respondents composed of four (4) office staff (OS), six (6) researchers (R), and three (3) IT Expert (ITE). The results indicate a high level of satisfaction as perceived by the respondents. The number of respondents are sufficient and is slightly higher when compared to the study of [12]. The scales for system evaluation to guide the respondents on how to assess the system is shown below:

Table 2. scales for system evaluation

Rating	Mean Range	Verbal Interpretation
5	4.21-5:00	Excellent
4	3.31-4.20	Very Satisfactory
3	2.61-3.30	Satisfactory
2	1.81-2.60	Fair
1	1.00-1.80	Poor

Table 3 shows the summarize results of the respondents based on the functional suitability of INSPIRE-MS. The evaluation results indicate that the system performs exceptionally well across all functional suitability criteria, with all user groups rating it as "Excellent." Specifically, the system achieves high marks for Functional Completeness (Mean: 4.25–4.33), ensuring all specified tasks and objectives are covered. It also excels in Functional Correctness (Mean: 4.33–4.67), consistently delivering accurate results with the required precision. Moreover, the system demonstrates strong Functional Appropriateness (Mean: 4.33–4.67), effectively supporting the accomplishment of tasks and objectives.

Table 3. Functional Sustainability Evaluation Result

Functional Sustainability	OS	ITE	R	Grand Total Mean	
	Mean	Mean	Mean	Mean	Description
Functional Completeness The system covers all the specified tasks and user objectives.	4.25	4.33	4.17	4.25	Excellent
Functional Correctness The system provides the correct results with the needed degree or precision.	4.5	4.67	4.33	4.5	Excellent
Functional Appropriateness It facilitates the accomplishment of specified tasks and objectives.	4.5	4.67	4.33	4.5	Excellent
Grand Mean	**4.42**	**4.56**	**4.28**	**4.42**	**Excellent**

The overall Grand Mean of 4.42 confirms that the system is highly effective and reliable across all user categories—office staff, IT experts, and researchers. These results suggest that the system is well-designed, meeting and exceeding user expectations with outstanding functionality.

The system's time behavior, which measures response time, processing speed, and throughput, was rated "Excellent" by IT experts (4.67) and researchers (4.33), while office staff rated it "Very Satisfactory" (4.0). The overall mean for this criterion was 4.33, categorized as "Excellent." For Resource Utilization, which assesses the efficiency of resources used by the system, office staff gave the highest rating of 4.75, followed by the researchers with 4.33, and IT experts with 4.0. The overall mean for this criterion was 4.36, rated as "Excellent."

The Capacity of the system, which evaluates its ability to meet maximum operational limits, was consistently rated "Excellent" across all groups, with scores of 4.75 from office staff, 4.33 from IT experts, and 4.50 from the researchers. The overall mean for this criterion was the highest at 4.53, rated "Excellent." The Grand Mean across all criteria and groups was 4.41, which is classified as "Excellent." The results indicate that the system performs exceptionally well in all performance efficiency criteria. Users across all groups expressed high satisfaction with its Time Behavior, Resource Utilization, and Capacity. Despite slight variations in scores as shown in Table 4, the system consistently meets or exceeds performance requirements, demonstrating reliability and effectiveness.

Table 4. Performance Efficiency Evaluation Result

Performance Efficiency	OS	ITE	R	Grand Total Mean	
	Mean	Mean	Mean	Mean	Description
Time Behavior The system response and processing times and throughput rates when performing its functions, meet requirements.	4	4.67	4.33	4.33	Excellent
Resource Utilization The system amounts and types of resources used when performing its functions, meet requirements.	4.75	4	4.33	4.36	Excellent
Capacity The system maximum limits of parameter meet requirements.	4.75	4.33	4.50	4.53	Excellent
Grand Mean	4.5	**4.33**	**4.39**	**4.41**	**Excellent**

Moreover, the results for compatibility criteria in Table 5 show that the system's co-existence functionality was

rated as "Excellent" overall, with researchers giving the highest mean score of 4.67, followed by IT experts with 4.33, and office staff with 3.75 ("Very Satisfactory"). Similarly, the system's interoperability was rated as "Very Satisfactory" overall, with a grand mean of 3.92. Consumers and IT experts gave equal scores of 4.0, while office staff rated it 3.75 ("Very Satisfactory").

The system demonstrates strong compatibility, with excellent performance in co-existing with other products and very satisfactory interoperability. While researcher feedback shows the highest satisfaction, there is room for slight improvement in meeting the expectations of office staff. Overall, the system meets its compatibility criteria effectively, with a grand mean of 4.08 ("Very Satisfactory").

Meanwhile, the usability evaluation of the INSPIRE-MS revealed an overall "Excellent" rating, with a grand mean of 4.36 across various user groups, including office staff, IT experts, and researchers. Specifically, the system was rated "Excellent" for Appropriateness Recognizability (4.47), ensuring users can determine its relevance to their needs; Learnability (4.64), indicating ease of learning and efficient use; Operability (4.42), signifying ease of operation and control; User Interaction Aesthetics (4.28),

Table 5. Compatibility Evaluation Result of the Respondents

Compatibility	**OS**	**ITE**	**R**	**Grand Total Mean**	
	Mean	**Mean**	**Mean**	**Mean**	**Description**
Co-existence The system can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.	3.75	4.33	4.67	4.25	Excellent
Interoperability The system can exchange information and use the information that has been exchanged.	3.75	4.00	4.00	3.92	Very Satisfactory
Grand Mean	3.75	**4.17**	**4.34**	**4.08**	**Very Satisfactory**

reflecting a visually pleasing interface; and Accessibility (4.53), demonstrating strong usability for a wide range of users. However, User Error Protection received a slightly lower rating of 3.94 ("Very Satisfactory"), indicating that while adequate error prevention measures are in place, there is room for improvement.

The system has been evaluated as highly usable across all groups, with most criteria rated "Excellent." The highest-rated aspect is Learnability, indicating that the system is particularly effective in helping users learn to use it efficiently. However, User Error Protection received a slightly lower score of "Very Satisfactory," suggesting an area for potential improvement. Overall, the system meets and exceeds expectations for usability, making it suitable for a diverse range of users, Table 6.

Further, based on the reliability criteria, the system demonstrated strong performance across all groups surveyed. For *Maturity*, the system received "Excellent" ratings from office staff (4.25), IT experts (4.67), and researchers (4.33), with a grand mean of 4.42 ("Excellent"). In terms of *Availability*, office staff rated it as "Excellent" (4.75), while IT experts and researchers rated it "Very Satisfactory" (4.00 and 4.17, respectively), leading to an overall grand mean of 4.31 ("Excellent"). For *Fault Tolerance*, all groups rated the system as "Excellent," with office staff scoring 4.50, IT experts 4.67, and researchers 4.17, resulting in a grand mean of 4.44 ("Excellent").

The system consistently meets the reliability criteria, receiving predominantly "Excellent" ratings across Maturity, Availability, and Fault Tolerance. This indicates that it performs reliably under normal operations, remains accessible when required, and functions as intended even in the presence of hardware or software faults. Overall, the system is highly reliable, with a grand mean of 4.39, reflecting an "Excellent" level of performance.

Table 6. Usability Evaluation Result of the Respondents

Usability	**OS**	**ITE**	**R**	**Grand Total Mean**	
	Mean	**Mean**	**Mean**	**Mean**	**Description**
Appropriateness Recognizability The system allows users to recognize if it is appropriate for their needs.	4.75	4.67	4.0	4.47	Excellent
Learnability The system can be used by specified users to achieve specified goals of learning to use the application with effectiveness, efficiency, freedom from risk, and satisfaction in a specified context of use.	4.75	5.0	4.17	4.64	Excellent
Operability The system has attributes that make it easy to operate and control.	4.75	4.0	4.5	4.42	Excellent
User Error Protection The system protects user	4.0	3.67	4.17	3.94	Very Satisfactory

against making errors.					
User Interaction Aesthetics The user interface enables pleasing and satisfying interaction for the user.	4.5	4.33	4.0	4.28	Excellent
Accessibility It can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use.	4.25	4.67	4.67	4.53	Excellent
Grand Mean	**4.45**	**4.33**	**4.30**	**4.36**	**Excellent**

Furthermore, the evaluation of the system's security criteria based on feedback from various user groups, resulted in an overall "Excellent" rating with a grand mean of 4.40. The system excelled in Integrity (4.44) and non-repudiation (4.56), ensuring data protection against unauthorized access and providing verifiable proof of actions taken. Confidentiality received a slightly lower but still "Very Satisfactory" rating of 4.19, indicating that while data access is restricted to authorized users, there is room for enhancement. Overall, the system demonstrates robust security features, with consistently high ratings affirming its reliability and effectiveness in safeguarding data.

4. CONCLUSION AND RECOMMENDATIONS

In conclusion, the development and deployment of INSPIRE-MS marked a significant advancement in streamlining research, innovation, and publication management at the Northern Iloilo State University. By adopting the Agile methodology, the system was iteratively refined to meet the specific needs of stakeholders, resulting in a user-centered and highly functional platform. The integration of the Research, Innovation, Publication modules into a cohesive system enabled seamless workflows, enhanced data accessibility, and improved decision-making processes. Stakeholders expressed satisfaction with the system's features, particularly its user-friendly design, robust analytics tools, and the ability to manage and track processes efficiently. INSPIRE-MS successfully aligned with institutional goals, positioning NISU closer to its aspiration of becoming a research university.

Additionally, future works may focus on enhancing the functionality and expanding the impact of INSPIRE-MS to meet evolving institutional and organizational needs. One significant area for improvement is the addition of an Extension Services Module to support the management of community extension projects, including streamlined processes for proposal submissions, activity tracking, and impact assessment. This would ensure that extension activities align with institutional objectives and deliver measurable benefits to the community. Another priority is the development of an improved notification system to provide stakeholders with timely and efficient updates about critical system activities, deadlines, and milestones, fostering better engagement and communication.

Deployment of INSPIRE-MS to other agencies or institutions is also recommended. Academic institutions could benefit from its comprehensive features, promoting more efficient research and innovation management on a broader scale. Additionally, future studies should focus on enhancing the analytics tools to include predictive and comparative capabilities, empowering stakeholders to forecast trends, identify opportunities, and benchmark performance against institutional targets. These advancements will ensure that INSPIRE-MS remains a robust, future-ready system capable of addressing the dynamic needs of its users while amplifying its impact across various sectors.

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