



RESEARCH ARTICLE

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ISUI TEACHING LOAD MANAGEMENT INFORMATION SYSTEM (ISUITLIMS) WITH FACULTY NEED ANALYSIS

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ABSTRACT

In 21st century, educational institutions have been urging into integrating technology in their day-to-day task. This is for promoting job satisfaction and productivity while constantly increasing productivity and quality of product and services they offer. One of the crucial activities for universities being conducted every semester is the faculty need analysis; this is to ensure that efficient resource allocation will be determined effectively. Doing this task relying more on manual processing results to error-prone, cumbersome, and hard to resolve difficulties. Thus, this study introduces the ISUI Teaching Load Information Management System (isuiTLIMS) aims to effective and efficient way of analyzing faculty need and introduce better way to manage teaching load related data such as classroom, class schedules, and overall faculty workload in a semester to include other quasi assignments such as research, extension and administrative designations. The developed system was also evaluated its extent of compliance with ISO 25010 Software Quality Standards. Findings show that the isuiTLIMS would promote a more systematic process of analyzing faculty need and managing faculty workload in a semestral basis, thus, promoting SMART-green educational community.



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I. INTRODUCTION

Effective allocation of faculty resources is a fundamental to maintaining academic quality, ensuring equitable workloads, and meeting the instructional needs of the higher education institutions [1], [2], [3]. Many universities in the Philippines are in unison that faculty need analysis is an efficient and effective system to properly determine required faculty after determining parameters such as number of subjects, class size, and clustered course offerings according to discipline [3]. For the Isabela State University – City of Ilagan campus (ISUI), the current process of determining semestral faculty need relies heavily on manual procedures and fragmented data sources, which can lead to inefficiencies, inaccuracies, and delays in decision-making [1]. Other processes relevant to faculty need are preparation and management of faculty workloads and schedules of subjects (students) and classrooms. These processes lead to delays and due less streamlined and coordinated faculty need process. To address these challenges, this study introduced the ISUI Teaching Load Information Management Systems (isuiTLIMS), a centralized platform designed to analyze and determine semestral faculty requirements automatically and transparently. The isuiTLIMS integrates key academic and administrative data to produce robust, repeatable analyses of teaching load and faculty demand. By consolidating information on system users, college and program profiles, curriculum structures and current teaching assignments, isuiTLIMS has able to streamline workload calculations and generate reports for department chairs, deans, registrars, and the academic affairs unit. This system-driven approach reduces manual effort, minimize errors, and support evidence-based decisions that align faculty capacity with curricular needs [4], [5]. The study were able to identify and document difficulties encountered in ISUI's existing faculty needs analysis process, highlighting bottlenecks, data gaps and procedural weaknesses. Through the isuiTLIMS modular functionalities such as users management, college and program profiles, curriculum management, faculty profile management, teaching load management and reporting, relevant inputs, workload rules, dynamic filtering and summaries, and detailed reports are tailored to institutional policies.

The study was evaluated as to its extend of compliance with ISO 25010 software quality standards, ensuring the platform's functionality, reliability, usability, performance efficiency, security, maintainability and portability meet recognized benchmarks. This study also aligns with several United Nations Sustainable Development Goals (SDGs). It primarily contributes to SDG 4 (Quality Education) by improving the institution's capacity to allocate qualified teaching resources effectively, thereby supporting better learning outcomes and academic quality. It supports SDG 8 (Decent Work and Economic Growth) by promoting fair and transparent workload distribution and enhancing working conditions for faculty and academic heads through data-informed staffing practices. By developing a digital, standards-compliant information system, the project advances SDG 9 (Industry, Innovation and Infrastructure) through the adoption of innovation and resilient institutional infrastructure. Additionally, by stronger institutional effectiveness consistent with SDG 16 (Peace, Justice and Strong Institutions). Beyond addressing immediate administrative needs, isuiTLIMS was intended to support strategic planning by providing consistent historical records and trend analyses of faculty allocations [6], [7]. The automation and standardization brought by the system will enable ISUI to be responsive to curriculum changes, student enrollment challenges and accreditation requirements.

II. MATERIALS AND METHODS

This study used mix methodology employing descriptive and developmental research approach. In the descriptive research design, the researcher employed qualitative method to address the and collect data related to problems and difficulties encountered by the research participants. Additionally, the researcher utilized the quantitative method to evaluate the extent of compliance with ISO 25010 software quality standards of the developed isuiTLIMS. For the development and design, the research employed the Joint Application Development (JAD) Model as the primary approach for the system development. JAD was used because it reduces the cost and time needed in project development since there is close communication among the administrations, developers, and end-users.

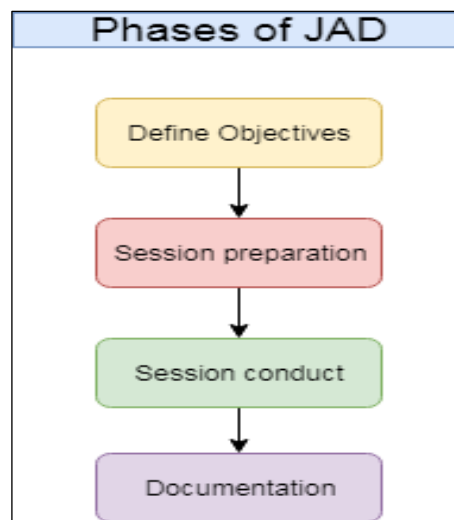


Figure 1: Joint Application Development (JAD) Model.
Source: Authors, (2026).

Phase of JAD Model

- *Phase 1 – Define Objectives.* In this phase, the problems encountered and difficulties of the end-users related to faculty need analysis and workload management are identified. During this phase the researcher and end-users established the scope and boundaries of the system, defining what was included and excluded from development. Measurable objectives for the isuiTLIMS were created to track the project success, alongside identification of key stakeholders including faculty members, department/program heads, and administrators. The team determined expected outcomes and deliverables that the system should produce, while setting a realistic project timeline with clear milestones to guide development progress.
- *Phase 2 – Session Preparation.* In this phase, the researchers conducted initial planning on the requirement of the study. Data gathering on the difficulties, challenges, practices and policies on managing faculty teaching load was identified for wider and deeper analysis of the system to determine the scope of the proposed system and to address the actual need of the end-users.
- *Phase 3 – Session Conduct.* In this phase, the blueprint of the proposed system was turned into reality through coding and testing of the modules identified. The researcher and its team developed process models and workflows that reflected improved procedures, while simultaneously creating user interface prototypes to visualize the proposed solution. This collaborative approach ensured the system design directly addressed the identified challenges in faculty workload management.
- *Phase 4 – Documentation.* In this phase, after the development of the proposed isuiTLIMS will be presented to the administrators of the campus and to the university for the approval of its possible implementation. A proposed training program will be presented to the office of the director for research and development. Series of trainings for campus system administrator, director, deans, college secretaries, program chairs and faculty members will be conducted for them to test and learn how to use the proposed system and to gather feedback and evaluation for its improvement. Test plans aligned with ISO 25010 quality standards were created to evaluate the completed system.

III. RESULTS AND DISCUSSIONS

A. *The problems encountered by the participants on the existing faculty need analysis and workload management.*

Below are some of the problems encountered and challenges experienced by the deans, program/department heads, registrar, AA and staff in the existing faculty need analysis and faculty workload management:

- Timely preparation of course offerings due to absence of a more systematic program curriculum checklist management.
- Some offerings posted by the registrar's office has discrepancies when forwarded to colleges for review by the program heads.
- Time consuming class scheduling preparations.
- Standard forms are not followed consistently.
- Difficulty in updating teaching load due to coordination concerns and issues.
- Desire to have a centralized system for faculty need analysis and workload management.

B. The developed ISUI Teaching Load Management System (isuiTLIMS)

After carefully defining the processes and deliverables through the collaborative efforts of the using the JAD (Joint Application Development) model, the ISUI Teaching Load Information Management System (isuiTLIMS) was successfully developed. This system was specifically designed to address and resolve the challenges and difficulties identified by the end-users. By incorporating their feedback and insights, isuiTLIMS offers a tailored solution that streamlines teaching load management, making it more efficient and user-friendly for all involved. The system is a direct response to the needs of the users, ensuring that their day-to-day tasks are simplified and more manageable [8].



Figure 2: isuiTLIMS Login Page.
Source: Authors, (2026).

As shown in Figure 2, the login page provides a secure entry point for the system. Only registered and verified users are granted access to the system's features and functionalities. Upon loading page, the isuiTLIMS logo appears along fields for entering username and password. To proceed, the user must enter their login credentials. If the username and password match, the system will redirect to the main dashboard. If the credentials are incorrect, an error message will be displayed, preventing further access to the isuiTLIMS. This ensures that only authorized users can interact with the system, maintaining data security and integrity [9], [10].



Figure 3: The main dashboard.
Source: Authors, (2026).

Figure 3 presents the main dashboard of the isuiTLIMS, serving as the central hub for system navigation. The dashboard features menus that link directly to various functionalities of the system, allowing users to easily access different sections. The page also provides insightful data analytics, such as the total number of curricula, faculty members and active faculty. In addition, it showcases visual data in the form of graphs, which break down information by gender, academic rank, employment status and the distribution of faculty across different colleges, programs/department. To make navigation even more personalized, the dashboard prominently displays the name of the user currently logged in, offering a seamless and secure experience as they interact with the system.

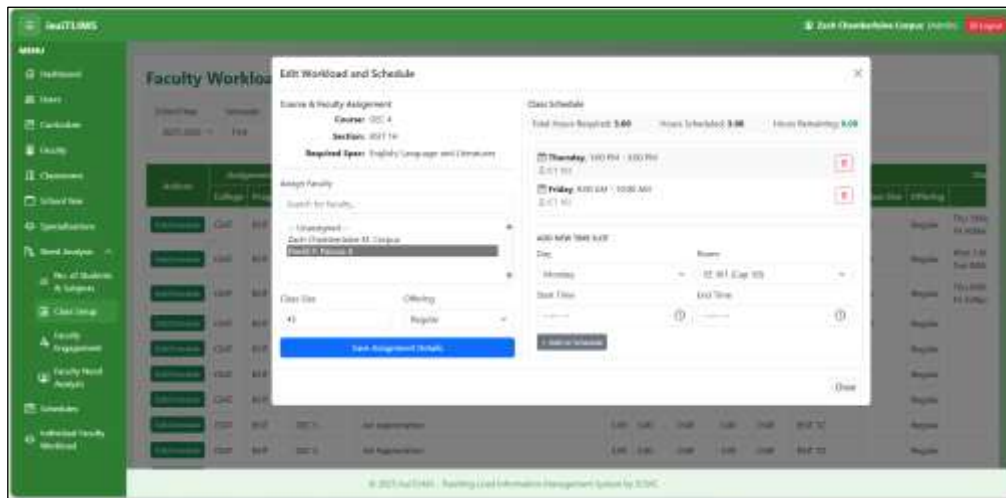


Figure 4: Faculty Workload Management.

Source: Authors, (2026).

Figure 4 presents the faculty workload management page, an essential interface designed for a systematic assignment of faculty members to specific courses and subjects. This module empowers program and department heads to efficiently allocate teaching responsibilities while ensuring that the faculty assigned to each course possesses the necessary specialization [11]. If the selected faculty member does not meet the required specializations, the automatically prevents the process from moving forward, ensuring the right expertise is always in place. Once the faculty member is successfully assigned, the user must input the required class schedules. The system takes it a step further by checking potential scheduling conflicts, alerting the user if there are any issues with faculty availability, room assignments, or sections. If a conflict is detected, the schedule cannot be added, ensuring that resources are not double-booked. In addition to preventing conflicts, the system also guards against over-scheduling. Helping to maintain a balanced workload for faculty. This systematic approach ensures smooth and efficient management of teaching assignments, supporting both faculty and administrative staff in maintaining an organized and effective academic environment [12], [13].

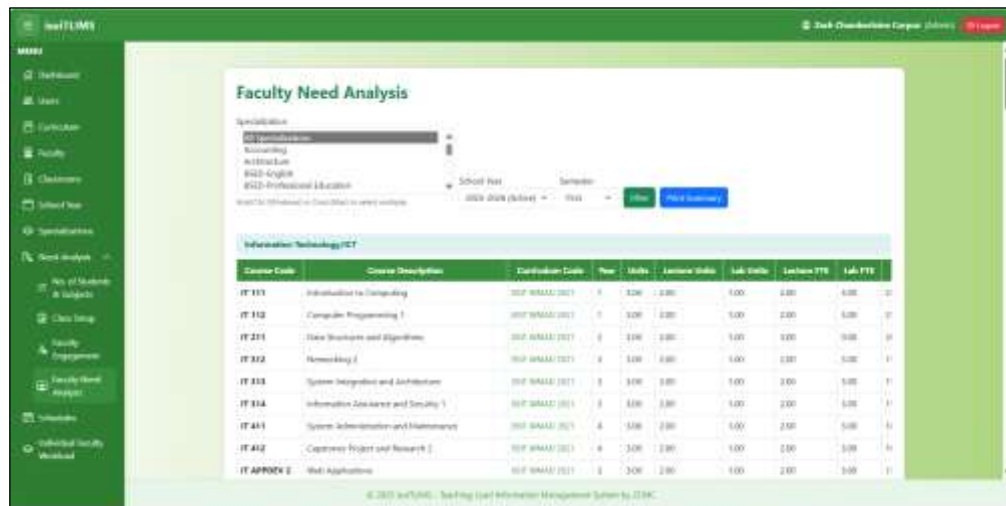


Figure 5: Faculty Need Analysis.

Source: Authors, (2026).

Figure 5 presents the faculty need analysis page, a dedicated interface that allows users to view faculty allocation requirement categorized by specialization. This page provides a clear overview of the faculty needs for each field, helping the committee make informed decisions regarding faculty allocation. To ensure the accuracy of the analysis, this page should only be accessed after the other relevant modules have been fully completed. Specifically, the Number of Students & Subjects, Class Setup, and Faculty Engagement modules must be properly filled out beforehand. By relying on complete and accurate data from the these modules, the system can generate a reliable faculty needs assessment, supporting efficient planning and optimal distribution of teaching responsibilities across the institution [14].



Figure 6: Faculty Need Analysis Report.

Source: Authors, (2026).

Figure 6 displays a sample of the Faculty Need Analysis Report, providing a detailed overview of the computed faculty allocation requirements. The report shows both 21 and 27 full-time Equivalent (FTE) scenarios. This report serves as an important tool for the campus workload committee, enabling them to make informed decisions regarding faculty assignments and resource allocation. Through presenting a clear and actionable data, the report supports effective planning and ensures that the campus maintains the balance of faculty members to meet academic needs [15].

C. Extent of compliance with ISO 25010 software quality standards of the developed isuiTLIMS

This section presents the response distribution of IT experts regarding the compliance of the developed system with the ISO 25010 Software Quality Standards and was assessed in terms of functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. The data was organized into a series of tables for clarity, providing a detailed overview of expert evaluations.

Table 1: Summary on the IT Experts' Evaluation of the Extent of Compliance of the Developed System with ISO 25010 Software Quality Standards.

Software Quality Characteristics	Mean	Descriptive Interpretation
1. Functional Suitability	4.38	Very Great Extent
2. Reliability	4.33	Very Great Extent
3. Performance Efficiency	4.38	Very Great Extent
4. Compatibility	4.25	Very Great Extent
5. Usability	4.42	Very Great Extent
6. Security	4.42	Very Great Extent
7. Maintainability	4.28	Very Great Extent
8. Portability	4.80	Very Great Extent
Grand Mean	4.50	Very Great Extent

Source: Authors, (2026).

Table 1 presents the summary of the IT expert's evaluation of the ISUI Teaching Load Information Management System (isuiTLIMS) across all eight characteristics of the ISO 25010 software quality standards. The system achieved as impressive grand mean of 4.50 affirming its overall quality with as descriptive interpretation of "Very Great Extent." This result reflects the system's exceptional quality and holistic success, indicating that it is not only functional and reliable but also efficient, secure, and user-friendly. In addition, the results demonstrate a well-rounded and robustly engineered software product. The overall success of isuiTLIMS directly addresses the challenges and goals identified throughout the related literature. The development of effective workload management systems, as discussed by AISaeed (2020) and Ariffin et al. (2020), requires a balance of functionality, efficiency, and fairness. The evaluation scores across all characteristics confirms that isuiTLIMS has effectively integrated these elements into a single, cohesive platform. Because of these, the system stands as a powerful tool for modern educational management, capable of streamlining administrative tasks, reducing faculty burden, and supporting data-driven decision-making for a more efficient and effective academic institution [16].

D. Proposed enhancement to improve the isuiTLIMS

The following are the proposed enhancements or improvements of the ISUI Teaching Load Information Management System (isuiTLIMS):

1. Deployment Over the Internet

At present the isuiTLIMS is accessed over local area network (LAN). This enhancement suggests a transition of deployment from LAN based to internet-accessible platform. The proposed enhancement would convert the system into a web-based application, allowing authorized users access if from anywhere in the world. The strategic move directly builds upon the system's high portability score by the untethering it from the physical confines of the campus. To achieve this, key features would need to be implemented, focusing robust user authentication, such as multi-factor authentication (MFA), to ensure a user is securely identified before gaining access on the system. Furthermore, all data transmission would be protected with SSL/TLS encryption (HTTPS). The platform's design would need to be responsive, providing a seamless experience on desktops, tablets and mobile devices. The resulting benefits would be transformative offering unparalleled accessibility and flexibility for faculty and administrators working remotely [17]. This would enhance overall efficiency, improve collaboration with off-campus personnel, and, if hosted on the campus web server or cloud platform, would also improve the system's scalability and disaster recovery capabilities.

2. Portal for Faculty and Students for Workload/Study Load Viewing

This significant enhancement is the creation of dedicated portals for faculty and students, which would expand the system from purely administrative tool into an institution-wide resource for viewing workloads and study loads. This feature would improve transparency and empower the primary stakeholders of the scheduling process [17] [18]. For faculty, the portal would feature a personalized dashboard displaying their current teaching assignments, total units, schedule, and overload/underload status in real-time. It would also serve as a repository of historical workload data and a channel for receiving important notifications about schedule changes. For students, the portal would provide a clear and simple view of their study load, offering a detailed timetable with course information, room assignments, and instructor details [19]. These would elevate the student and faculty experience, making isuiTLIMS an indispensable part of the university's daily digital ecosystem.

IV. CONCLUSIONS

Based on the results, evaluations and feedback from the users, the ISUI Teaching Load Information Management System (isuiTLIMS) have demonstrated it exceptional quality and suitability for its intended purpose. Based on a assessment by IT experts using ISO 25010 software quality standards, it confirms that isuiTLIMS is a robust, effective, and well-designed solution for managing academic teaching loads. Additionally, the isuiTLIMS offers a practical and needed solution to the difficulties and challenges faced the Deans, Program/Department Heads, AA Director, Registrar, and Staff in managing teaching load records, especially in faculty need analysis. Therefore, the isuiTLIMS successfully addresses the critical need for an automated, efficient and reliable method of managing teaching load and analyzing faculty need per semester. It effectively replaces cumbersome, error-prone manual process with a centralized, data-driven system that enhances administrative productivity, ensures fairness in workload distribution, and provides a solid foundation for informed decision-making within the institution.

V. AUTHOR'S CONTRIBUTION

Conceptualization: Zach Chamberlaine M. Corpuz.

Methodology: Zach Chamberlaine M. Corpuz.

Investigation: Zach Chamberlaine M. Corpuz.

Discussion of results: Zach Chamberlaine M. Corpuz.

Writing – Original Draft: Zach Chamberlaine M. Corpuz.

Writing – Review and Editing: Zach Chamberlaine M. Corpuz.

Resources: Zach Chamberlaine M. Corpuz.

Supervision: Zach Chamberlaine M. Corpuz.

Approval of the final text: Zach Chamberlaine M. Corpuz.

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