Design of the CSU Alumni Information System Based on Jakob Nielsen's Heuristic Evaluation Model: A User - Centric Approach

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Abstract – Caraga State University (CSU) recognizes its alumni as vital partners in sustaining academic and professional excellence; however, alumni engagement has been hindered by outdated manual processes and the lack of a dedicated digital platform. This study presents a user-centric Alumni Information System, designed and evaluated using Jakob Nielsen's Heuristic Evaluation Model to ensure accessibility, efficiency, and intuitive user interaction. Developed through a Design and Development Research (DDR) approach, the system integrates essential features such as secure registration, personalized profiles, event management, job postings, communication tools, and a searchable alumni directory. Usability testing with 100 alumni and graduating students yielded an overall rating of 3.5 out of 4.0, classified as "Good to Excellent", confirming strong performance in areas such as visibility, consistency, and error prevention. By embedding heuristic principles into the design process, the system bridges engagement gaps and strengthens lifelong alumni-university connections. This research underscores how usability-driven design can transform alumni relations, laying the groundwork for future scalability, backend integration, and institution-wide adoption.

Keywords – Heuristic Evaluation, Design and Development Research, User-Centered Design

1 Introduction

In today's interconnected digital world, the role of technology in sustaining institutional and professional relationships has become indispensable. Higher education institutions increasingly rely on digital platforms to maintain meaningful engagement with their alumni communities, who serve as vital contributors to institutional reputation, industry linkages, and mentorship opportunities [1]. However, many universities continue to experience barriers in sustaining active alumni involvement due to outdated systems and inefficient communication channels [2]. These challenges underscore the necessity of user-centered technological interventions to enhance alumni connectivity and participation in institutional development.

At Caraga State University (CSU), alumni relations have historically been facilitated through manual processes such as reunions, newsletters, and office-based record management. While these traditional strategies foster camaraderie, they have become increasingly ineffective in addressing the needs of a geographically dispersed alumni population. The absence of an integrated digital platform has resulted in inconsistencies in alumni data, delayed processing of requests, and limited engagement opportunities [3]. This situation highlights an urgent need for a centralized, accessible, and efficient digital system that bridges alumni and institutional communication gaps.

Digital transformation in higher education has proven essential for streamlining operations and sustaining community ties [4]. A responsive and accessible information system not only facilitates faster service delivery but also strengthens alumni loyalty and institutional identity [5]. By leveraging human–computer interaction (HCI) principles, particularly usability heuristics, universities can design systems that are intuitive, inclusive, and adaptable to user needs [6]. Jakob Nielsen's Heuristic Evaluation Model provides a well-established framework for assessing such systems, ensuring that they meet standards of efficiency, learnability, and satisfaction [7].

Guided by this framework, this study presents the design and evaluation of the Caraga State University Alumni Information System (CSU-AIS)**,** a prototype developed under the principles of Design and Development Research (DDR) [8]. The system integrates usability heuristics such as visibility of system status, consistency, error prevention, and flexibility, aligning with CSU's commitment to digital innovation and institutional modernization [9]. By embedding these principles, the system ensures that users can easily navigate and manage tasks such as registration, event participation, and access to job postings.

The Caraga State University Alumni Information System (CSU-AIS) also functions as a strategic tool to promote lifelong engagement by enabling continuous interaction between alumni and the university. It provides essential features including a searchable alumni directory, event and career listings, communication tools, and profile management functionalities—all anchored in a minimalist and CSU-branded interface [10]. These design choices reflect a deliberate emphasis on clarity, familiarity, and efficiency, ensuring that the system is accessible even to users with varying levels of technological proficiency.

This study aims to bridge the gap between alumni engagement and digital usability. It seeks to demonstrate how heuristic-based design enhances the user experience and supports institutional goals of inclusivity, data accuracy, and community connection. The development of this alumni system represents not merely a technological upgrade but a strategic institutional investment toward sustainability and digital empowerment [11]. Through this initiative, CSU strengthens its role as a digitally responsive university prepared to meet the challenges of an evolving educational landscape.

2 Methods

2.1 Conceptual Framework

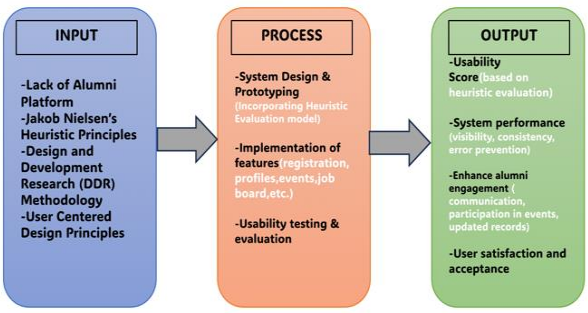

Fig. 1. Conceptual Framework

Fig. 1 is anchored on Jakob Nielsen's Heuristic Evaluation Model and User-Centered Design principles, applied through the Design and Development Research (DDR)

methodology. It connects usability heuristics (input) to system design and development (process), producing improved user experience and engagement (output). By integrating heuristic principles and usability testing, the system ensures efficiency, accessibility, and intuitiveness while supporting alumni involvement and CSU's digital transformation goals.

2.2 Design and Development Research Methodology

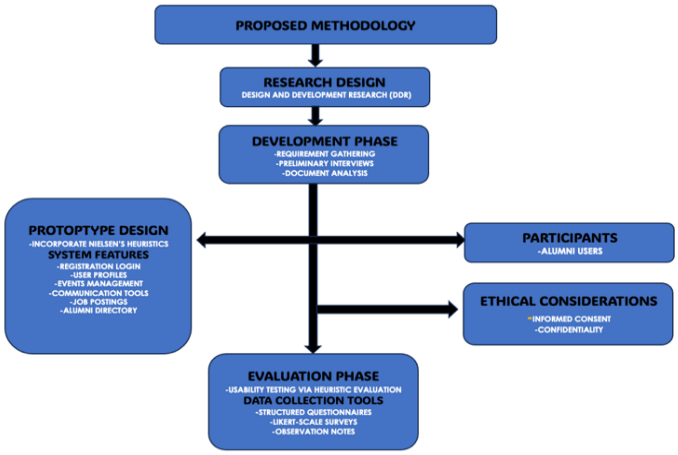

Fig. 2. Design and Development Research

Fig. 2 shows a simple process for creating and testing the CSU Alumni Information System. It starts by gathering ideas and needs from interviews and documents, which are then used to design a prototype with useful features like registration, event management, communication tools, job postings, and an alumni directory. This prototype is improved using Nielsen's usability principles to make it easy and practical for users. Alumni themselves will test the system through surveys and observations, helping ensure it really works for them. All throughout, the study values ethical practices, making sure participants give informed consent and that their information stays confidential.

2.3 Use Case Diagram

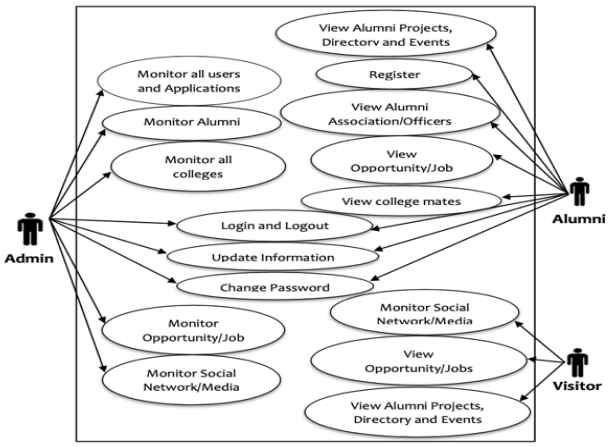

Fig. 3. Use Case Diagram of CSU Alumni Information System

Fig. 3 illustrates the interactions of three user roles—Admin, Alumni, and Visitor—with the Alumni Information System. Admins manage users, alumni data, colleges,

job opportunities, and social media. Alumni can register, log in, update profiles, view job opportunities, connect with peers, and access alumni events. Visitors have limited access, primarily viewing job postings and alumni directories.

2.4 Respondents and Data Collection

The study involved 100 purposively selected respondents composed of CSU alumni and graduating students, who provided usability feedback through a quantitative approach. Data were collected using Google Forms with a 5-point Likert scale, then encoded and statistically analyzed using spreadsheets to ensure accurate assessment of the system's usability.

2.5 Heuristic Evaluation

Table 1 presents the Heuristic Evaluation criteria applied to assess the usability of the CSU Alumni Information System. The evaluation is based on Jakob Nielsen's ten usability principles, focusing on aspects such as system visibility, consistency, error prevention, and aesthetic design. Each criterion outlines how the system supports alumni users through intuitive navigation, consistent design standards, efficient interactions, and accessible help features, ensuring a user-friendly and reliable experience.

Table 1. Heuristic Evaluation Criteria

No.	Heuristic Principle	Evaluation Indicators
1	**Visibility of System Status**	• The system clearly displays a notification center where alumni receive real-time updates on system activities • System messages and status updates use terminology and language familiar to CSU alumni.
2	**Match Between System and the Real World**	• Terminology and language used in the system reflect terms commonly understood by CSU alumni. • Concepts, labels, and navigation paths align with the real-world experiences and expectations of CSU alumni.
3	**User Control and Freedom**	• Intuitive navigation controls allow alumni users to move freely within the system. • Clear options are provided for returning to previous steps or exiting ongoing processes.
4	**Consistency and Standards**	• The system maintains uniform design components, including layout, fonts, and color schemes. • Interaction patterns follow established standards and conventions within the CSU community.
5	**Error Prevention**	• Input validation mechanisms prevent common user errors (e.g., during registration). • Confirmation prompts are provided for critical actions to prevent accidental submissions or selections.
6	**Recognition Rather than Recall**	• Important information, such as account details and upcoming activities, is prominently displayed. • Navigation options are clearly defined and easily accessible to reduce memory load.
7	**Flexibility and Efficiency of Use**	• The system improves efficiency by minimizing the time and effort required to complete tasks. • The interface supports both novice and experienced CSU alumni users through easy-to-use features.
8	**Aesthetic and Minimalist Design**	• The interface is visually appealing and avoids unnecessary elements to focus on the alumni experience. • The design emphasizes CSU branding while maintaining a clean and organized layout.
9	**Help Users Recognize, Diagnose, and Recover from Errors**	• Error messages are concise, clearly stated, and provide suggestions for corrective actions. • Visual error indicators (e.g., required-field warnings or alert icons) are clearly shown in forms such as registration.
10	**Help and Documentation**	• The system provides easily accessible help resources, including FAQs and user guides. • Support channels (e.g., "Contact Us") are available for additional assistance and troubleshooting.

3 Results and Discussion

3.1 The Design of the CSU Alumni Information System

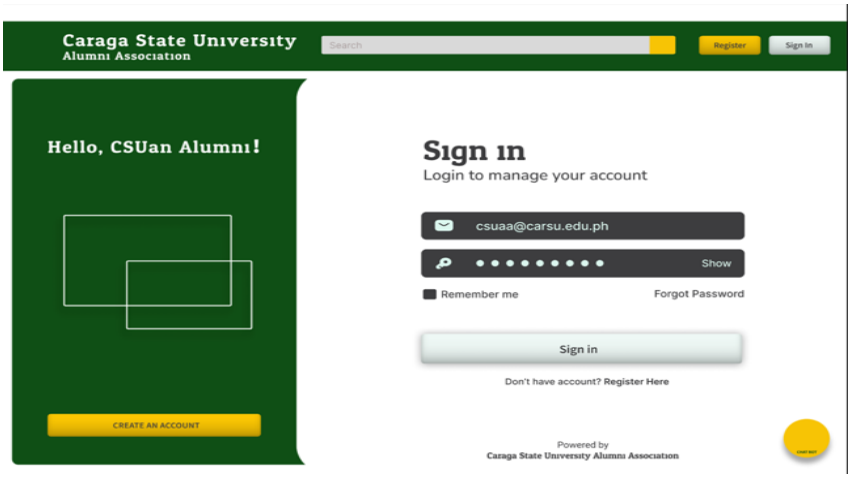

Fig. 4. Landing page of CSU Alumni Information System

Fig. 4 interface serves as the main entry point for Caraga State University alumni to access their accounts. The page features a user-friendly sign-in panel where alumni can log in using their registered CSU email and password, as well as options to remember login credentials or recover forgotten passwords. A welcoming message, "Hello, CSUan Alumni!", is displayed alongside a prompt for new users to create an account. The overall layout emphasizes accessibility and simplicity, aligned with the university's branding and the CSU Alumni Association's identity.

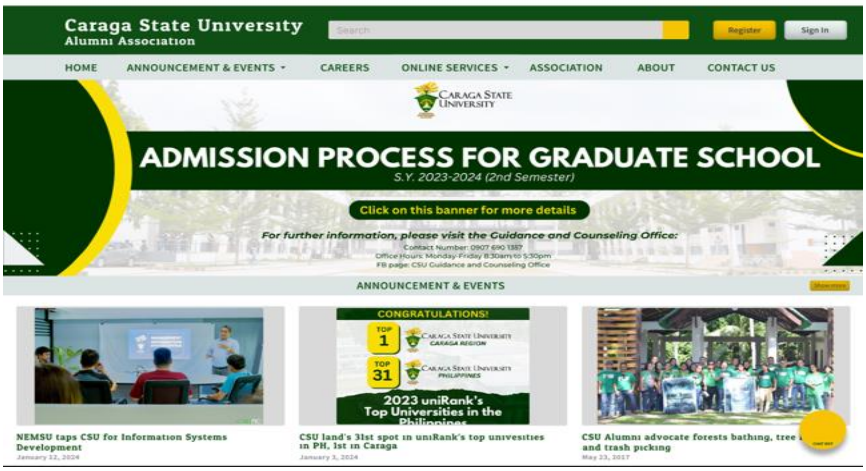

Fig. 5. Homepage of CSU Alumni Information System

Fig. 5 serves as the main interface of the Caraga State University Alumni Information System, showcasing announcements, events, and updates relevant to CSU graduates. The navigation bar at the top includes quick access to Announcements & Events, Careers, Online Services, Association Info, and Contact Us, reflecting the system's goal of keeping alumni connected and informed.

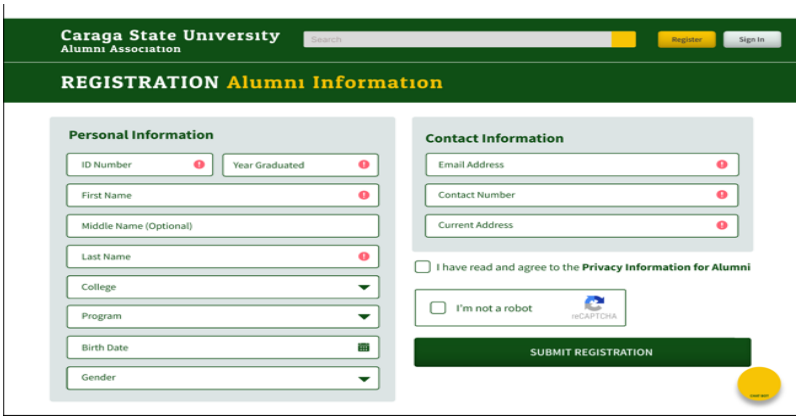

Fig. 6. Alumni Registration Interface of CSU Alumni Information System

Fig. 6 interface allows Caraga State University alumni to register and provide their personal and contact information to create an account in the system. The registration form is divided into two main sections: *Personal Information*—which includes fields such as ID number, name, college, program, year graduated, birth date, and gender—and *Contact Information*, which requires email address, contact number, and current address. The form also includes a privacy agreement checkbox, CAPTCHA verification, and a *Submit Registration* button to ensure data validity and user authentication.

3.2 Participants and Scoring Framework

The usability evaluation of the CSU Alumni Information System involved 100 purposively selected participants from CSU–Main Campus, including both graduating students and alumni, with a balanced mix of age and gender to ensure fair and reliable results. Using Jakob Nielsen's Heuristic Evaluation Model in Table **1**, the system was assessed across ten usability principles through a Likert scale ranging from 0 ("Critical Problem") to 4 ("Not a Problem"). Data collection was conducted via Google Forms, allowing for convenient and confidential participation. This approach reflects the study's strong commitment to a user-centered design, ensuring that the system's development is guided by the actual experiences and feedback of its intended users.

3.3 Evaluation Results

Table 2 shows the Heuristic Evaluation result of the CSU Alumni Information System showed strong results, with all usability criteria earning high ratings and an overall score of 3.5 out of 4.0, reflecting a "Good to Excellent" level of usability based on Nielsen's standards. These findings indicate that the system provides a smooth and user-friendly experience, offering clear feedback, a consistent design, and easy navigation, while minimizing usability issues that could affect user interaction and satisfaction.

Table 2. Evaluation Result

Heuristic Criteria	**Average Score**
Visibility of System Status	3.8
Match Between System and Real World	3.7
User Control and Freedom	3.5
Consistency and Standards	3.6
Error Prevention	3.4
Recognition Rather than Recall	3.2
Flexibility and Efficiency	3.3
Aesthetic and Minimalist Design	3.5
Error Recovery	3.6
Help and Documentation	3.4
Overall Average Heuristic Score:	**3.5 / 4.0**

This indicates a "Good to Excellent" usability level according to Nielsen's evaluation guidelines.

3.4 Discussions of Findings

As shown in Table 2, the CSU Alumni Information System has strong usability, with high scores in system status visibility (3.8) and alignment with user expectations (3.7), ensuring clear feedback, intuitive navigation, and familiar terminology. It maintains a consistent, minimalist design (3.5–3.6) reflecting institutional branding, while error prevention and recovery features (3.4–3.6) enhance user trust. Though intuitive for both novice and experienced users (3.3–3.5), the system could be improved with accelerators and interactive support like tutorials. Guided by Jakob Nielsen's Heuristic Evaluation Model, the platform effectively applies usability principles, addresses common issues, and was positively received by 100 alumni and graduating students, confirming its potential to enhance engagement, simplify access to university information, and strengthen long-term connections with CSU.

4 Conclusion and Future Considerations

The design and evaluation of the CSU Alumni Information System revealed that a heuristic-driven, user-centered approach significantly enhances the platform's usability and accessibility. With a high usability rating of 3.5 out of 4.0 based on Jakob Nielsen's principles of visibility, consistency, and error prevention, the system demonstrates the effectiveness of incorporating user feedback throughout the design process. It successfully addresses long-standing challenges in CSU's alumni management—such as fragmented data, limited communication, and manual processing—by offering features like secure registration, interactive event listings, and automated feedback tools. Ultimately, the CSU Alumni Information System strengthens the digital connection between graduates and the university, aligning with CSU's commitment to digital transformation and sustainable community engagement.

Although the CSU Alumni Information System has shown promising usability results, it currently functions only as a front-end prototype. Future development should focus on integrating a fully functional backend database, implementing role-based access control, and adopting cloud-based storage for real-time data synchronization. Adding analytics dashboards could help the university gain valuable insights into alumni engagement and institutional performance, while expanding access through mobile applications and AI-powered chat support would improve convenience and responsiveness. To ensure inclusivity, CSU is encouraged to conduct ongoing usability testing with diverse alumni groups. Collaboration with the Information Systems and Computer Science departments will also be vital for maintaining, scaling, and integrating the system with other university services. With these continuous enhancements, the CSU Alumni Information System can grow into a comprehensive and sustainable platform that strengthens alumni connections and fosters a more engaged CSU community.

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