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Bridging the Gap Between Universities and Alumni: A User-Centered Evaluation of a Digital Alumni Engagement Platform

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Abstract: Universities face an ongoing challenge in fostering meaningful connections with their alumni communities. This paper presents the development and evaluation of the Alumni Tracer and Engagement Hub, a web-based platform designed to bridge the gap between universities and their alumni. The study employed a comprehensive approach, utilizing McCall's Software Quality Model for technical evaluation during the development and testing phases. Following deployment, a user-centric evaluation assessed the platform's effectiveness in achieving its objectives. This evaluation leveraged the ISO/IEC 25010 model and gathered feedback through surveys and interviews with alumni, administrators, and staff. The evaluation results revealed a strong technical foundation, with high marks for security, self-documentation, code clarity, and user-friendliness (McCall's model). User feedback (ISO/IEC 25010 model) indicated positive experiences with core functionalities like functional completeness, performance, and learnability. However, areas for improvement were identified in the user interface aesthetics, clarity of element purpose, and user perceptions of data security. This paper discusses these findings and proposes recommendations for optimizing the platform's user experience, strengthening data security measures, and ensuring long-term technical maintainability. By implementing these recommendations, the Alumni Tracer and Engagement Hub has the potential to become a valuable tool for universities to strengthen alumni connections and build a thriving alumni network.

Keywords: Alumni Engagement, User-Centered Evaluation, Alumni Relations, Technology-Driven Platform, Software Quality Evaluation

1. Introduction

Maintaining strong relationships with alumni communities is a strategic priority for universities worldwide. These connections offer a multitude of benefits, including fostering a sense of belonging among graduates [1], providing valuable career mentorship opportunities for current students [2], and generating crucial financial and social capital for the institution [3]. However, in today's increasingly

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digital world, traditional methods of alumni engagement, such as printed newsletters and infrequent alumni events, are often proving less effective [4]. This has led to a growing need for innovative solutions that can bridge the gap between universities and their alumni more engagingly and sustainably.

This paper explores the development and evaluation of the Alumni Tracer and Engagement Hub, a web-based platform designed to address this very challenge. The platform aims to foster ongoing communication and engagement between universities and their alumni by providing a centralized hub for news updates, career resources, networking opportunities, and alumni-driven content creation.

The study employed a two-pronged approach to assess the platform's effectiveness. First, McCall's Software Quality Model [5] was utilized during the development and testing phases to evaluate the platform's technical quality attributes, such as operability, maintainability, and security. Following deployment, a user-centric evaluation focused on the platform's ability to achieve its objectives of fostering engagement and strengthening alumni connections. This evaluation leveraged the ISO/IEC 25010 model [6], a leading model for assessing software products that defines a product quality model composed of eight characteristics [7], and gathered valuable feedback through surveys and interviews with alumni, administrators, and staff.

The following sections of this paper will explore the process of development, evaluation methodology, and key findings. The proponent will analyze the platform's technical strengths and weaknesses based on McCall's model evaluation. McCall’s questionnaire was used to evaluate the following system criteria: Correctness, Reliability, Efficiency, Integrity, Usability, Maintainability, Testability, Flexibility, Portability, Reusability, and Interoperability [8]. Furthermore, the proponent will examine user feedback from the International Organization for Standardization/International Electrotechnical Commission 25010 (ISO/IEC 25010) model evaluation, exploring areas where the platform excels in promoting user experience and engagement while also identifying areas for improvement. Finally, the paper will discuss these findings and propose recommendations for optimizing the Alumni Tracer and Engagement Hub, ultimately enabling it to become a more robust and valuable tool for universities seeking to build stronger and more engaged alumni communities.

2. Literature Review

Universities are increasingly recognizing the immense value alumni can contribute, not just financially but also by enhancing the institution's reputation and attracting new students [9]. A key factor in this relationship is alumni commitment, defined as the “emotional attachment” and “behavioral loyalty” graduates hold towards their alma mater [10]. Technology has emerged as a powerful tool for fostering this commitment by facilitating communication, engagement, and a sense of community [11]. This literature review explores how technology can be leveraged to strengthen alumni-alma mater relationships.

Understanding what drives alumni loyalty is crucial for developing effective engagement strategies. Snijders *et al.* [12] have identified factors like perceived quality of education, positive student experiences, and strong faculty relationships as key drivers. Cownie and Gallo [13] have emphasized the role of fostering a sense of gratitude among alumni, highlighting its connection to increased engagement. These findings underscore the importance of creating a positive and memorable student experience that fosters a lasting emotional attachment to the university.

Several studies explore the use of technology platforms for managing alumni relations. Several studies, including those by Bista *et al.* [14], Rajini *et al.* [15], and Luciano *et al.* [16], explore the development and implementation of alumni portals and tracking systems. These systems typically offer features for data management, communication tools, and online directories similar to the Alumni Tracer

and Engagement Hub. While these studies demonstrate the growing adoption of such platforms, a gap exists in understanding how these systems can be designed to balance comprehensive functionalities with user-centric design principles for optimal engagement [9].

Social media platforms offer another avenue for fostering alumni connections. Pedro *et al.* [10] highlight the strategic use of social media by universities to promote alumni engagement. Pucciarelli and Kaplan [17] have emphasized the importance of "remaining connected" with alumni rather than simply “reconnecting” after graduation. Jepps *et al.* [18] discussed the potential of alumni social networking sites, but further research is needed to understand how these platforms can be integrated effectively with broader alumni engagement strategies.

To explore the connection between alumni engagement and identity, fostering a strong alumni community can contribute to a more positive alumni identity [19], leading to increased engagement and support for the university. The Alumni Tracer and Engagement Hub, by providing a platform for interaction, networking, and shared experiences, has the potential to nurture this sense of community and strengthen the alumni-alma mater bond.

This review highlights the growing importance of alumni engagement in higher education and the potential of technology to facilitate strong alumni-alma mater relationships. While existing alumni management systems and social media platforms offer valuable tools, further research is needed to explore how these technologies can be designed to promote user engagement and foster a vibrant alumni community. The development and evaluation of the Alumni Tracer and Engagement Hub presents a unique opportunity to contribute to the field of alumni relations research. By employing a user-centered design approach and integrating core functionalities, the Alumni Tracer and Engagement Hub aims to foster deeper alumni engagement.

3. Methodology

This study employs an iterative development methodology, prioritizing continuous improvement and user feedback throughout the development lifecycle [20]. This approach allows for short development cycles where user needs are translated into features, implemented, and then refined based on ongoing user input. This iterative cycle ensures the platform's functionality aligns with user requirements and evolves to meet their needs over time. Following deployment, a dedicated maintenance phase guarantees continuous improvements based on user feedback.

The initial stages of the Alumni Tracer and Engagement Hub development are crucial for laying a strong foundation. The requirement analysis phase thoroughly examines the project's surroundings, user characteristics, and the current organizational framework. This thorough review guarantees that the platform is seamlessly integrated with existing workflows and meets the specific requirements of the alumni population. In addition, a cost-benefit analysis is performed to evaluate the project's financial viability, examining possible approaches to recover costs and ensure long-term sustainability. Through a comprehensive examination of these factors, the requirement analysis phase ensures the development of a platform that is both operational and economically feasible.

Following this, the planning phase explores the technical aspects. In this context, a thorough assessment is conducted to determine the project's technical feasibility. This entails the careful selection of suitable technologies, taking into consideration industry norms and user requirements. However, the process extends beyond mere tool selection; the planning phase prioritizes the smooth integration of these tools. The entire platform's design, encompassing web applications, mobile apps, and data flow, is meticulously planned to ensure optimal and uniform functionality.

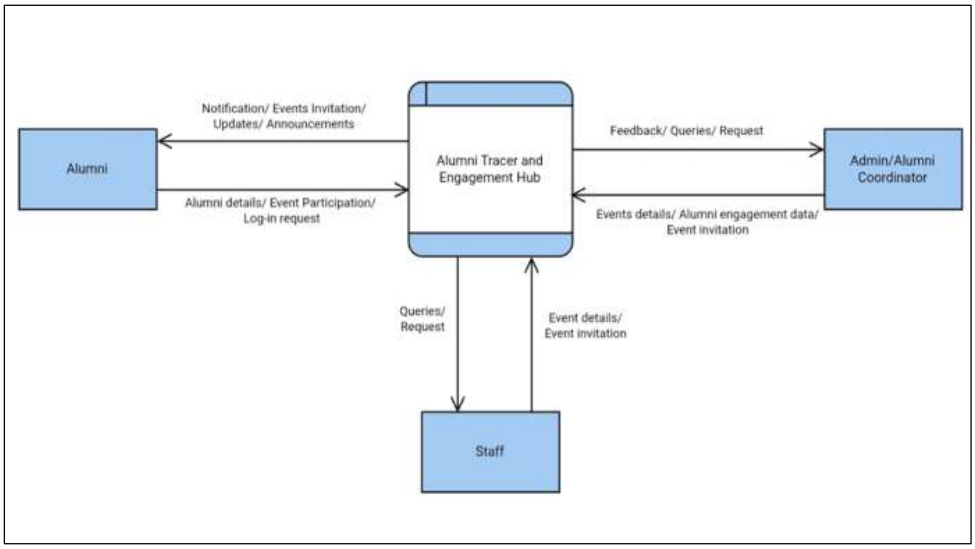

Figure 1. Context Diagram

Figure 1 presents a high-level overview of the Alumni Tracer and Engagement Hub, illustrating how the system interacts with its primary users: alumni, alumni coordinators, and staff. This visual representation shows the data exchange between these users and the system, highlighting key functions such as profile management, event management, and communication. This initial diagram serves as a foundation for a more comprehensive analysis of the system's inner workings and processes.

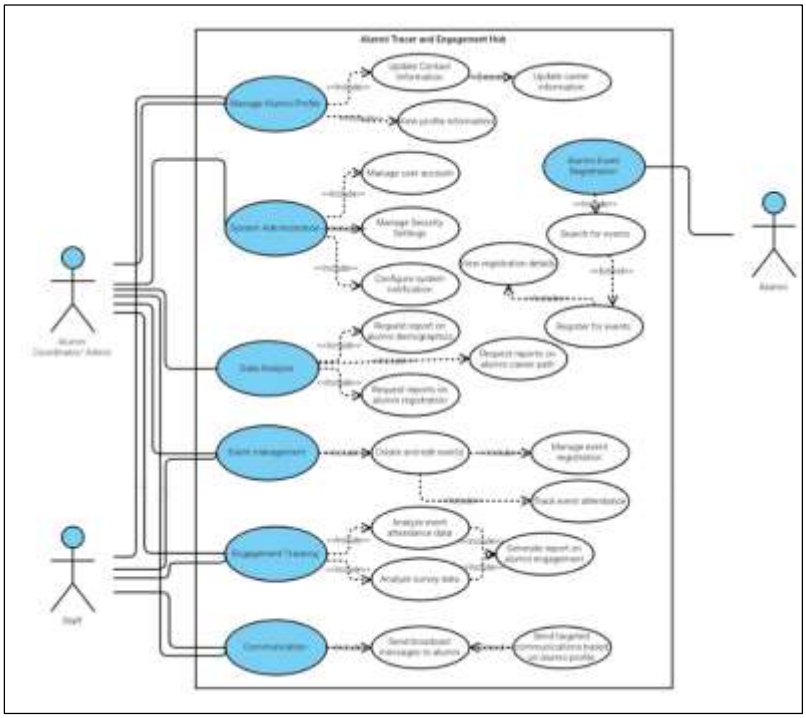

Figure 2. Use Case Diagram

Figure 2 displays a Use Case Diagram, which presents a user-focused perspective of the features available in the Alumni Tracer and Engagement Hub system. This diagram focuses on how different types of users interact with the system and showcases the main actions each user can take to achieve their specific goals.

The development phase converts the design documents into operational code. The selected technologies are employed to develop web and mobile applications, guaranteeing a smooth user experience on all platforms. Thorough testing is carried out at every stage of development. This encompasses unit testing, which validates the functionality of individual code modules, and integration testing, which guarantees the seamless collaboration of all components.

Figure 3. Mobile Application User Interface for Alumni

The Alumni mobile app, as shown in Figure 3, is designed with a user-friendly interface that prioritizes easy navigation. Its main screen features essential information like upcoming events and news updates, along with shortcuts to commonly used features. The app includes a personalized profile section where alumni can update their details, connect with other graduates using a searchable directory, and access exclusive content. Event registration is simplified, and push notifications to ensure alumni stay informed about important updates and activities.

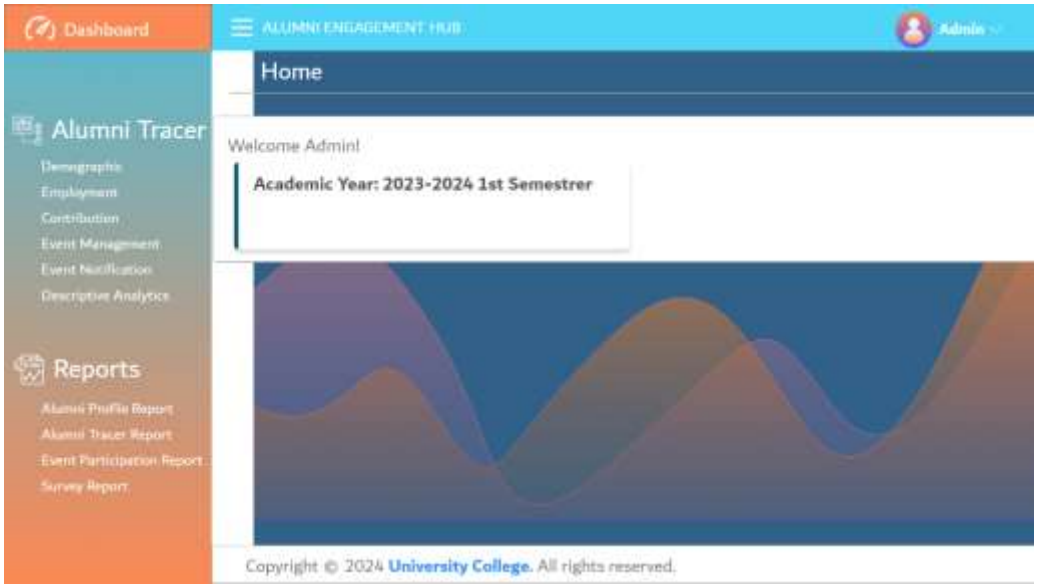

Figure 4. Web Application User Interface for Administrator

The admin interface of the Alumni Tracer and Engagement Hub, shown in Figure 4, is designed to be both functional and user-friendly for managing alumni information and platform operations. It features a clear dashboard displaying key metrics like user engagement, upcoming events, and new registrations. Administrators can easily manage user accounts, create and edit content, and access detailed reports on alumni activity through user-friendly menus. The platform also includes robust features like secure data export and role-based access controls.

Following deployment, a dedicated maintenance phase guarantees continuous improvement based on user feedback. This ensures the platform evolves to meet user needs over time. The development, testing, and maintenance phases culminate in a fully functional Alumni Tracer and Engagement Hub. The platform's success should be evaluated based on its ability to achieve its intended goals. To maximize the effectiveness of the Alumni Tracer and Engagement Hub, a thorough evaluation was conducted using two distinct models: McCall's Software Quality Model for technical aspects and the ISO/IEC 25010 Software Quality Model to gauge user experience.

The findings from both evaluations offer valuable insights into the technical performance and overall user experience of the Alumni Tracer and Engagement Hub. By continuously monitoring results, soliciting user feedback, and implementing improvements based on the evaluation results, the platform can evolve into a vital tool for strengthening alumni relations and fostering a mutually beneficial connection between alumni and the institution.

4. Results and Discussion

To maximize the effectiveness of the Alumni Tracer and Engagement Hub, a thorough evaluation was conducted using two distinct models: McCall’s Software Quality Model for technical aspects and the ISO/IEC 25010 Software Quality Model to gauge user experience. Five instructors from the University of Antique's College of Computer Studies, with their expertise in software development and quality assurance, played a crucial role in applying McCall's model to evaluate the platform.

Table 1 presents McCall's Software Quality Model Rating Scale, which is used to assess various software quality factors. The scale assigns numerical values to different quality levels, allowing for a standardized evaluation process. The leftmost column displays the quality level designations, typically ranging from “Very Good” to “Poor.” The corresponding numerical range for each quality level is shown in the next column. For instance, “Very Good” might be assigned a value between 4.21 and 5.00. By applying this rating scale during an evaluation, IT experts can assign values based on how well the software meets the criteria for each quality factor.

Table 1. McCall’s Rating Scale

Rating Range	Description
4.21 – 5.00	Very Good
3.61 – 4.20	Good
2.61 – 3.60	Average
1.81 – 2.60	Fair
1.00 – 1.80	Poor

The second assessment involved gathering feedback from 30 University of Antique alumni, using the ISO/IEC 25010 model to evaluate user-focused aspects such as suitability, usability, and efficiency.

Table 2 shows the ISO 25010 Rating Scale which is used to evaluate software quality based on a set of characteristics defined by the ISO/IEC 25010 Software Quality Model. The first column shows the ratings assigned during the evaluation process with ratings ranging from 1 to 5. The next column defines the characteristics associated with each rating level. For instance, a rating of 5 corresponds to "Very High," indicating the software excels in that particular quality aspect.

Table 2. ISO/IEC 25010 Rating Scale

Rating	Description
5	Very High
4	High
3	Moderate
2	Low
1	Very Low

The findings from both evaluations, detailed in the accompanying tables, offer valuable insights into the technical performance and overall user experience of the Alumni Tracer and Engagement Hub.

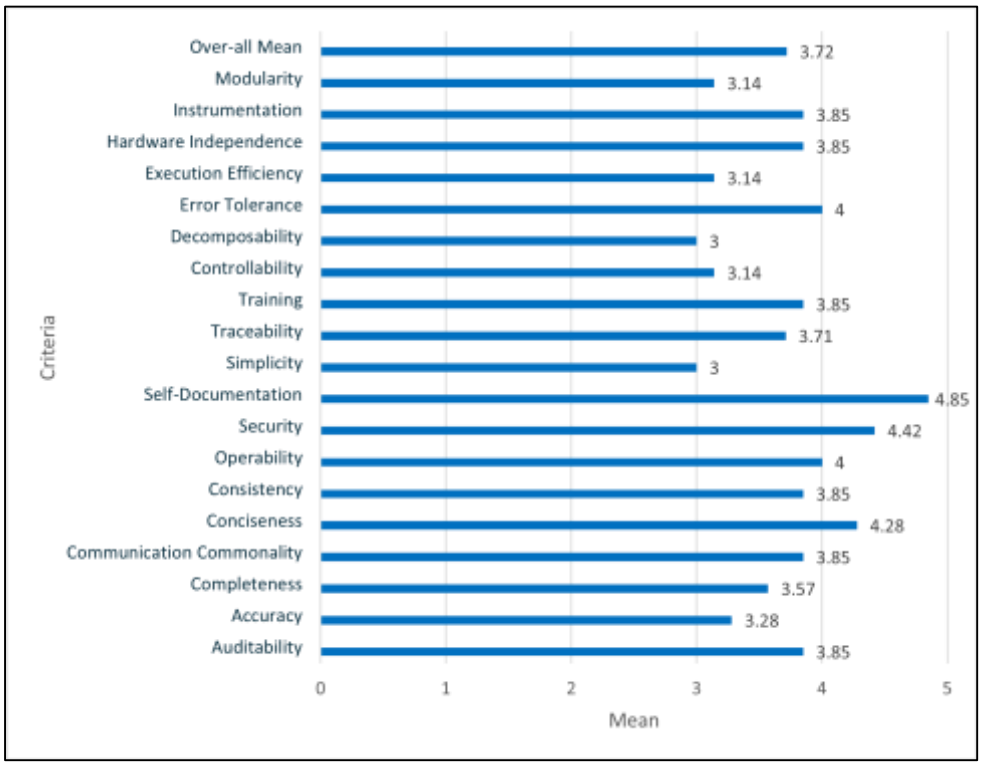

Figure 5. Summary of Result of Ratings by IT Experts using McCall's Software Quality Model

Figure 5 summarizes the results of the technical assessment of the Alumni Tracer and Engagement Hub conducted by IT experts from the University of Antique's College of Computer Studies. The experts rated the system on various criteria using McCall's Software Quality Model.

The detailed ratings in Figure 5 provide a comprehensive overview of the system's technical strengths and weaknesses, offering valuable insights for further development and enhancement. The overall mean rating of 3.72 indicates that the system is considered "Good" in terms of technical quality. Specific areas where the system excelled include security (4.42), self-documentation (4.85), conciseness (4.28), and operability (4.00), all rated as "Very Good." However, some areas require improvement, such as simplicity (3.00) and decomposability (3.00), both rated as "Average."

Thirty University of Antique alumni participated in a user evaluation of the Alumni Tracer and Engagement Hub, offering feedback based on the ISO/IEC 25010 model. Figure 6 presents a summary of the key findings. Overall, the results are favorable, with an average rating of 4.17, which is considered "High" on the ISO/IEC 25010 model scale.

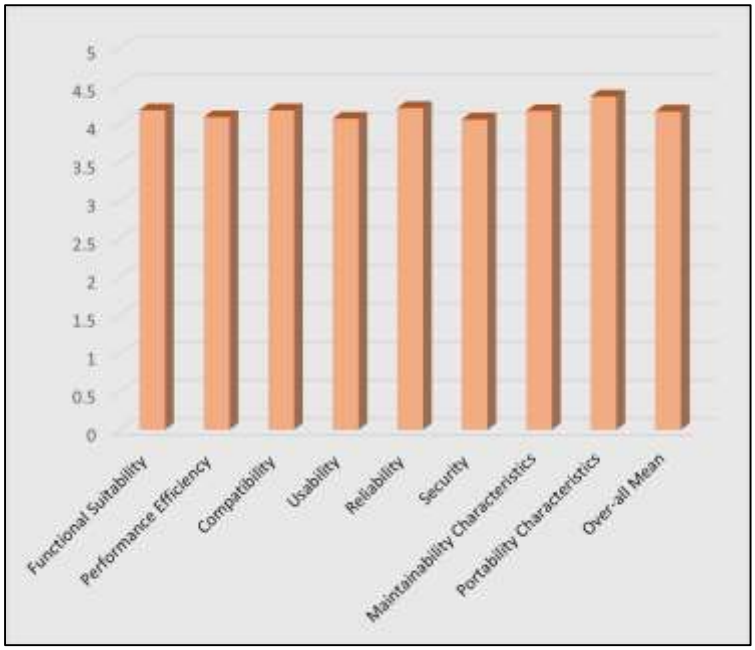

Figure 6. Summary of Result of Ratings by Alumni using ISO/IEC 25010 Model

The Alumni Tracer and Engagement Hub underwent a comprehensive evaluation process that blended technical expertise with user feedback. A dual strategy, employing McCall's Software Quality Model and the ISO/IEC 25010 model, allowed for a thorough assessment of the platform.

The technical evaluation by IT experts highlighted a strong foundation with notable strengths in security, documentation, code clarity, and user-friendliness. End-user feedback, gathered from alumni, also revealed a positive overall experience, particularly in terms of functionality, performance, and ease of learning. However, opportunities for improvement were identified in areas such as interface aesthetics, clarity of element purpose, and perceived data security. By addressing these concerns, the user experience and trust can be enhanced. The combined results provide a roadmap for prioritizing enhancements. Focusing on technical refinements like maintainability and addressing any potential security issues identified by experts will ensure the platform remains robust. Additionally, responding to user feedback on interface design and clarity will further enhance the user experience and encourage continued engagement.

5. Conclusion and Recommendations

In conclusion, this study highlights the potential of the Alumni Tracer and Engagement Hub to effectively connect universities with their alumni. The platform's solid technical base and positive user feedback on core features demonstrate its promise. By refining the user interface design and addressing concerns about data security, the platform can become a valuable tool for nurturing stronger alumni relationships and fostering a more active alumni community.

The evaluation results suggest several recommendations to enhance the Alumni Tracer and Engagement Hub. First, user interface aesthetics should be refined by conducting further user testing and implementing design best practices. Second, the clarity of element purpose and function labels should be improved, potentially through icons and tooltips. Third, user communication on data security should be strengthened through informative content and frequently asked questions (FAQs). Fourth, additional security features, such as two-factor authentication or data encryption, could be considered. Finally, continued focus on code maintainability is crucial to ensuring the platform's adaptability and longevity. By implementing these recommendations, the platform can be optimized for both user experience and long-term functionality.

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