Volume 1 | Issue 2 | Jul - Dec 2023
ISSN: 2984-9896

Valena Heritage Network (VALENANet): Design and Development of CSU Lal-Lo Website

Adolfo A. Taroy
Rey Mark O. Tarubal
Elmer R. Curioso Jr.
John Paul Josef P. Alcid
Rhojane Mae Onza
Lyngel A. Balas
Edenjoy A. Manuel
Marvin D. Adorio
marvin_adorio@csu.edu.ph
orcid.org/0000-0003-4362-0157
Cagayan State University – Sanchez Mira Campus
Sanchez Mira, Cagayan, Philippines

ABTRACT

This study employs a descriptive and developmental design approach, focusing on the creation and enhancement of a website for Cagayan State University Lal-lo Campus. Through interviews with the campus planning coordinator and information officer, key inputs for the study's conceptual framework were identified. The project follows the System Development Life Cycle, specifically adopting the Agile methodology. The outcomes, based on the evaluations of eight system experts, reveal that the developed website aligns significantly with the ISO 25010:2011 criteria. The website serves as a comprehensive platform, offering essential information about the campus' programs, activities, achievements, and projects. It proves to be an invaluable resource for various stakeholders including current and prospective students, employees, and visitors, fostering engagement and interaction with the campus environment. The website effectively addresses the administration's need for an independent, dynamic online platform, surpassing the limitations of existing social media applications and ensuring broader audience accessibility. With an intuitive design, heightened functionality, and up-to-date content, the website significantly enhances the online experience for the academic community and stakeholders. It empowers the university administration to efficiently disseminate pertinent information, thereby bridging communication gaps. Overall, this website not only fulfills its primary objectives but also sets the stage for improved connectivity and engagement within the academic realm.

Keywords: *Descriptive and Developmental Design, Website Development, Agile Methodology, ISO 25010:2011 Criteria, Campus Information System*

INTRODUCTION

In this digital age, people mostly rely on the internet to acquire information. The whole civilization has become dependent on modern media as its helps people of different ages in different ways. Technology has made life easier and more convenient. Websites, as a valuable outcome of technology, help companies and organizations inform the world of their purpose of existence, services, and programs, activities and projects. These are effective and efficient platforms in sharing information. For these reasons, browsing websites has become an integral part of life.

An educational website is an essential tool for institutions of learning in conveying up-to- date information about their programs and services to stakeholders. A good campus website is expected to include a range of quality content to include accomplishments, achievements, activities and future engagements. It presents the institution's profile and a clear idea about what it endeavors to achieve. Moreover, it allows for the establishment of linkages between and among other institutions, communities, and the entire world.

The Cagayan State University Lal-lo Campus is an education of higher learning that has identified the need of an independent, active and dynamic website that will aid the administration in the dissemination of relevant information. Without any limitations, the website shall widen its audience reach from the limited existing social media applications.

Objectives of the Study

To meet the need, this study aimed to develop a website for CSU Lal-lo through this research project, "Valena Heritage Network (ValenaNet): Design and Development of CSU Lal-Lo Website". The project involved a holistic way of collecting institutional information about administration, academics, research and development, and community engagement. The website serves as a comprehensive online platform which provides students, faculty and staff, alumni, stakeholders, and a wider community an easy access to essential information and resources related to academic programs and administrative services. It also aims to enhance communication, facilitate collaboration, and promote engagement within the academic community. In addition, it features a comprehensive directory of campus services where users can easily find contact information and downloadable forms ensuring convenient access to essential support services.

Overall, the campus website shall provide a seamless online experience to users ensuring that they easily navigate and find the information they need. By promoting effective communication, collaboration, and engagement, the website would contribute to the growth, development, and success of the CSU Lal-lo academic community.

MATERIALS AND METHODS

Research Design

This research project employed the descriptive and development method using Software Development Life Cycle (SDLC) specifically the Agile Methodology. The Agile methodology in software development is an approach based on iterative development. In this method, tasks are broken into smaller iterations, or parts do not directly involve long term planning. The project scope and requirements are laid down at the beginning of the development process.

Figure 1 depicts Agile methodology in Software Development as a process that produces software with the highest quality and lowest cost in the shortest time possible. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating.

System Architecture

Figure 2 depicts how the developed website functions. To test its credibility, the information officer submits the contents and materials to be

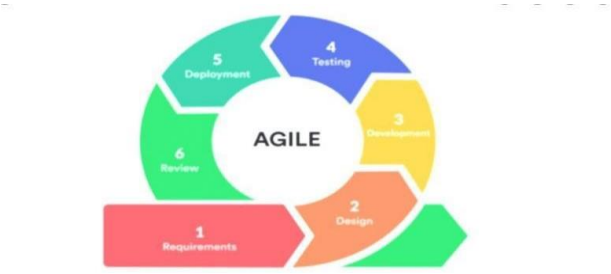


Figure1. https://targettrend.com/agile-methodology-meaning-advantages-disadvantages-more

posted to MIS coordinator. During the process, the submitted reports will be inputted by the MIS coordinator who has the ability to perform CRUD (create, read, update, delete) in the website by logging into Admin Panel. If the inputted admin code and pass code is not recorded in the login database, access to the admin panel will be denied. As the output, once verified, data will be published online.

Context and Data Flow Diagram

The developed website system is depicted graphically in the following image (Figure 3). The materials uploaded in website are the responsibility of the Information Officer and the MIS coordinator with the latter as the authorized administrator of the admin panel.

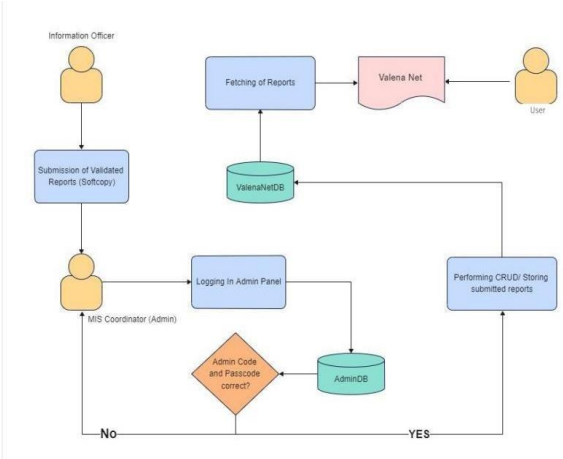


Figure 2. System Architecture

Context and Data Flow Diagram

The developed website system is depicted graphically in the following image (Figure 3).

The materials uploaded in website are the responsibility of the Information Officer and the MIS coordinator with the latter as the authorized administrator of the admin panel.

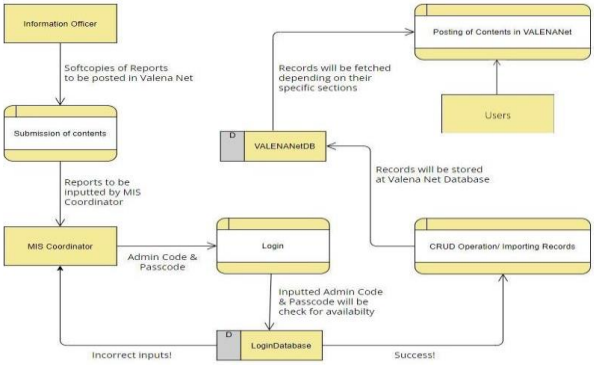


Figure 3: Lvl. 0 Data Flow Diagram of the proposed project

Sampling Technique

The data for this research were collected using a questionnaire administered to farmers in the Municipality of Pamplona, Cagayan. A systematic random sampling method was employed to select the respondents from the farming population.

Participants of the Study

The project development team, as outlined in Table 1, consists of key members with distinct roles. The Planning coordinator and Information Officer serve as primary informants and contribute crucial inputs to the website. Meanwhile, the MIS coordinator takes charge of deploying the website. In addition, a group of IT professionals and campus officials, referred to as panelists and evaluators, play a pivotal role in assessing the website's features and performance in line with software quality standards.

Table 1. Participants of the Study

Participants	Number
Planning Coordinator	1
WebAdministrator/MIS Coordinator	1
Information Officer	1
IT professionals as panelists	5
Campus officials as website evaluators	3

Locale of the Study

The following were used in gathering the needed data in the study:

Heatmaps. Heatmaps were used by the developers to visually represent user interactions on the website, showing where users click, scroll, or spend the longest time. This tool helped the developers identify the parts of the website that need improvement.
Feedback Tabs. Feedback tabs allowed the developers to gather random user feedback. These tools provided valuable insights into usability, accessibility, and overall user satisfaction.

Key Informant Interview. Interviews were conducted with the campus information officer and the planning coordinator to collect vital data and information related to the features on the website.

Documentary Analysis. Sample reports and documents were requested from the campus planning office and these were analyzed to provide useful information in the design of the website.

Data Gathering Procedure

Prior to data gathering and collection, the researchers performed the following steps:
1.Sought approval from the Campus Executive Officer for the conduct and development of the website.
2.Sent a request letter to the concerned campus officials for the conduct of interview to gather data as specified in the objectives of the study.
3.Sent formal communication to IT professionals for them to be informed of being chosen to test the viability of the system before site deployment. Their suggestions during the evaluation were considered for the improvement and enhancement of the website.

Analysis of the Data/ Statistical treatment

The answers obtained from the participants in the interviews were recorded and studied. The interviewee's responses were noted and from there interesting points related to the interview questions were taken up to help in the analysis of the responses.
Mean was used to analyze the rating of the IT experts with respect to the compliance of the developed website in relation to ISO standards. The extent of compliance of the system was rated using the following matrix:

Table 2. Likert Scale for the Measurement of the Extent of Compliance to ISO 25010:2011 Software Quality Standards

Mean Range	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very Great Extent	Outstanding
3.40 – 4.19	Great Extent	Very satisfactory
2.60 – 3.39	Moderate Extent	Satisfactory
1.80 – 2.59	Low Extent	Fair
1.00 – 1.79	Very Low Extent	Poor

Hardware Used

Laptop: Developers used laptops in system development due to portability allowing developers to work from various locations, collaborate with team members, and perform on-site demonstrations. This versatility

enabled the installation of different development tools, programming languages, and environments, facilitating efficient coding, debugging, and testing.

Desktop: To check the responsiveness of the website, developers used different gadgets such as desktop.

Table 3. Minimum Hardware Requirements for the Proposed System

Minimum Requirements	
Hardware Components	*Size*
CPU	2.0 – 3.5 GHz
RAM	4 GB
SSD (for faster performance)	256 GB
Server IP (optional)	1 IP Address

Software Used

Visual Studio Code: Developers of the above-mentioned system used VS Code for its lightweight nature, rich editing environment, language support, integrated version control, extension ecosystem, cross-platform compatibility, and community support make it a suitable choice for developing systems. MySQL Database: The database used by the developers because of its database management, data manipulation, SQL querying, import/export capabilities, security features, relationship visualization, user-friendly interface, and community support make it a valuable tool for developing systems.

Adobe Photoshop: Developers used the platform for developing high-quality custom images that's been used for banners and icon.
WYSIWYG Editor: WYSIWYG stands for "What You See Is What You Get." It is used to allows developers to see a representation of the final output while editing content or designing a layout. In other words, the displayed content during editing closely resembles the way it will appear when published or displayed to the end-user.

XAMPP: XAMPP is an acronym that stands for "Cross-Platform, Apache, MySQL, PHP, and Perl." It is a widely used open-source software package that provides a local development environment for building and testing web applications. XAMPP is designed to be easy to install and use, making it popular among developers, especially those working with PHP and MySQL.

Bootstrap: is a popular open-source framework for building responsive and mobile-first websites and web applications. It provides a collection of CSS and JavaScript components, as well as pre-designed templates and themes, that make it easier to create visually appealing and functional web interfaces.

Table 4. Minimum Software Requirements for the Proposed System

Minimum Requirements	
Software	*Versions*
Windows OS	10
XAMPP	8.0.11
WYSIWYG (Summer note)	0.8.18
Adobe Photoshop	2019
Bootstrap	5
Visual Studio Code	1.6.0

RESULTS AND DISCUSSION

The User Interface

The user interface of a campus website typically serves as a digital gateway for students, faculty, staff, and other members of the campus community to access various services, information, and resources related to the campus. Here's a description of CSU Lal-lo campus website user interface:

Administration Login Panel: It provides access to administrative functions and controls. Typically designed for authorized administrators who have specific privileges and responsibilities within the campus or institution.

In addition, the login credentials of a registered admin are being converted into a hexadecimal code to prevent sabotaging whenever there's a leakage issue of the database.

Dashboard: Upon successful login, administrators are directed to the dashboard, which serves as the main control center of the Admin Login Panel. The dashboard provides an overview of key information and statistics related to the campus or institution. It may include summary data, quick links to commonly used functions, and notifications about important updates or tasks.

Home Page: It serves as the landing page for the website. It includes a visually appealing layout with high-quality images showcasing the campus, students, and various activities. It may also feature important announcements, upcoming events, and quick links to commonly accessed information.

Search Bar: It present on the homepage or in the header area to facilitate quick searches within the website. Users can enter keywords or phrases to find specific information, such as courses, faculty members, campus facilities, or resources.

Events and News Section: This section features the latest campus news, announcements, and upcoming events. Users can find details about lectures, workshops, conferences, performances, and other campus activities. It may also include an archive of past events and news articles.

Navigation Menu: It features a prominent navigation menu at the top or side of the page depending on the current layout. This menu provides easy access to different sections of the website, such as Home, Admissions, Academics, Research and Developments, and etc.

The System Interface

User-side

The user side page consists of different sections like the homepage where in all of the main contents such as campus announcements and events are posted. Also, the user have an access to visit About CSU, Administration, Academics, RDE and PRM menus.

Figure 5. Homepage

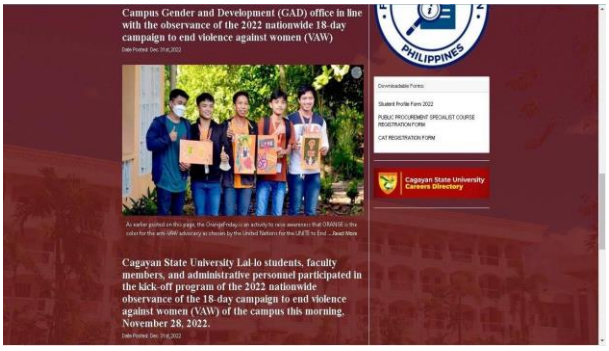


Figure 6. Continuation of Homepage

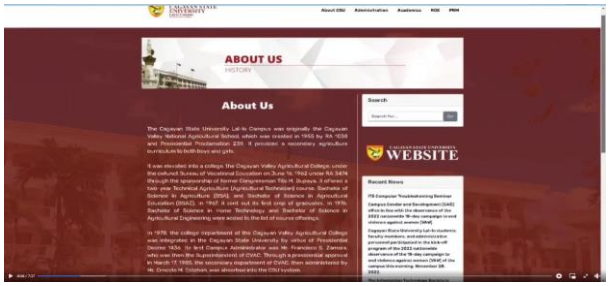


Figure 7. About Us Section

Figure 8. Administration Section

Figure 9. Academic Section

Figure 10. RDM Section

In this section, only the authorize personnel have the authority to access the Admin Dashboard. To ensure security, the admin login credentials are converted into hexadecimal code using md5 hash and security PHP code to prevent bypass by accessing directly using Admin Dashboard local host URL.

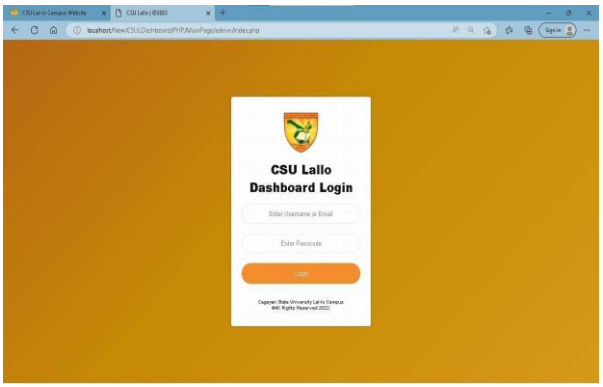
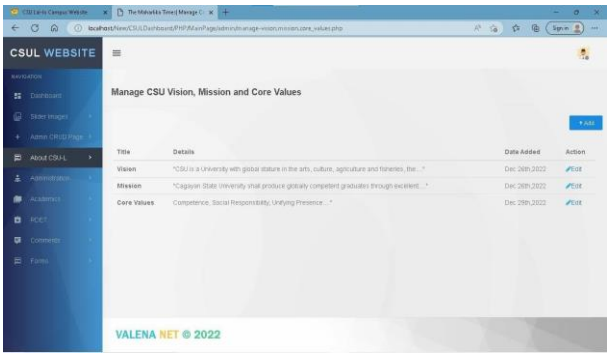
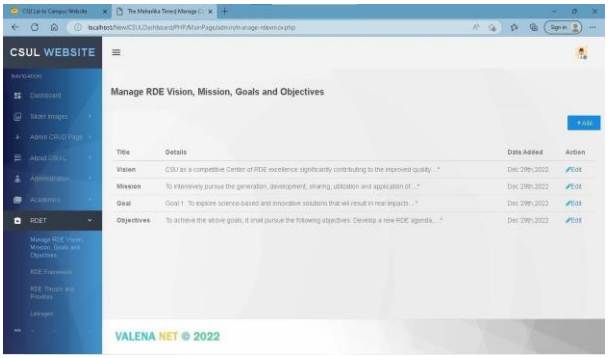
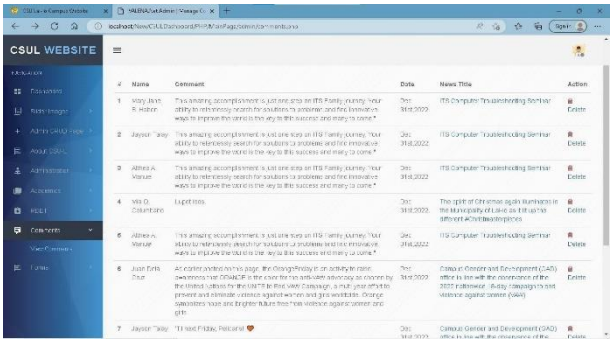


Figure 11. Administration Login Panel

If the Admin successfully entered the needed credentials. The website will directly take the admin- to-admin dashboard where in the authorized personnel have the authority to perform CRUD.







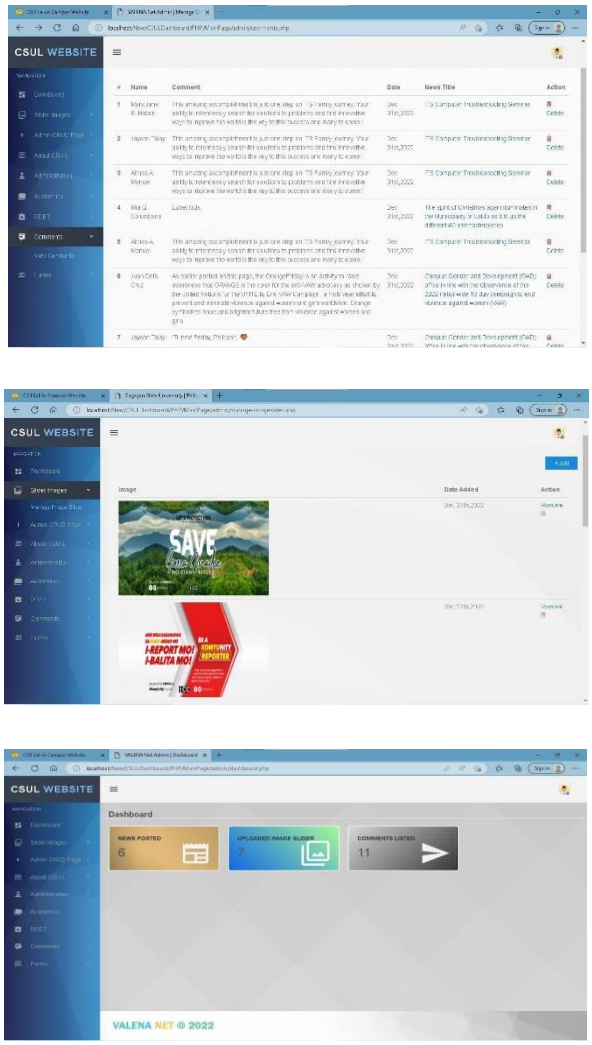


Figure 12. Administration Dashboard

Extent of Compliance of the Developed Application to ISO 25010 Software Quality Standards

Table 5. Summary Table of the Assessment of IT Experts and Users of the Extent of Compliance of the Developed System to ISO 25010

Criteria	**IT Experts (N=8)**	**Users (N=1)**
	Weighted Mean	Weighted Mean
Functional Suitability	3.78	4.20
Reliability	3.76	4.36
Usability	3.82	4.37
Performance Efficiency	3.87	4.39
Maintainability	3.96	4.28
Portability	3.90	4.23
Security	3.48	4.36
Compatibility	3.57	4.33
Overall Weighted Mean	3.77	4.32

It can be seen from the table that a varying result of the assessment made is comparable. In particular, the users generally assessed the compliance of the website to a very great extent with a mean of 4.32 as compared to the assessment of IT experts with a mean of 3.77. This finding agrees to the study of Jabar et al. (2013) titled "Assessing the Usability of University Websites from Users' Perspectives" which showed that different user perspectives derived from varied areas of specialization give different evaluation. Normally, due to technical difference of experience and skills, the developed system has sustained a significant level of conformity to software quality standards. Similarly, the perceived compliance with the standard reflects the overall positive impression of the system. Further, the results show that system does not only conform to but extends beyond standards of the ISO 25010 *Enhancements that can be Made to the Developed System.*

Additional features and capabilities to enhance the developed system include those that support talent alumni tracking and library resources.

CONCLUSIONS

The study embarked on designing and developing a website for Cagayan State University (CSU) Lal-lo Campus with a focus on addressing the need for an independent, active, and dynamic online platform. In today's digital era, websites play a pivotal role in disseminating information effectively to a

wider audience. The CSU Lal-lo Campus recognized this importance and aimed to enhance communication, collaboration, and engagement within its academic community and beyond.

By employing a descriptive and developmental design approach, the study gathered inputs from key campus stakeholders, including the campus planning coordinator and information officer. The project embraced the System Development Life Cycle with an emphasis on Agile methodology, allowing for flexibility and iterative development. Through this process, the "ValenaNET" website was created, encapsulating comprehensive information about the campus's academic programs, services, achievements, and more.

The study's findings highlighted that the developed website exhibited a significant degree of compliance with the ISO 25010:2011 criteria for software quality standards. This compliance covered various aspects such as functional suitability, performance efficiency, usability, reliability, security, maintainability, and portability. The website effectively met these standards, enhancing the online experience for students, employees, visitors, and other stakeholders.

The website serves as a valuable resource, offering easy access to pertinent information, facilitating communication, and fostering collaboration. It overcomes limitations of existing social media platforms and establishes a robust online presence for CSU Lal-lo Campus. Additionally, the study identified avenues for further enhancement, ensuring the continuous improvement of the website's functionality and user experience.

In essence, the "ValenaNET" website contributes to the growth and development of the CSU Lal-lo academic community by providing an intuitive, informative, and engaging online platform. This study underscores the significance of responsive and user-centric web design in meeting the evolving information needs of educational institutions and their stakeholders in the digital age.

RECOMMENDATIONS

The study aims to create a comprehensive online platform to provide information about the campus, its programs, activities, services, accomplishments, and more. The website is intended to enhance communication, collaboration, and engagement within the academic community and beyond. The study utilizes Agile methodology and evaluates the developed website's compliance with ISO 25010 Software Quality Standards.

Given this context, here are some recommendations for your study:

User-Centric Approach: Ensure that the website design and development process remain focused on the needs of the users, including students, faculty, staff, alumni, and other stakeholders. Prioritize user experience and usability to make the website user-friendly and effective.

Content Management: Establish a clear and organized content management strategy to keep the website up-to-date. Regularly update information about programs, activities, achievements, and services. Consider implementing a content management system (CMS) that enables easy content updates.

Accessibility: Ensure that the website is designed with accessibility in mind, catering to users with disabilities. Follow accessibility guidelines such as Web Content Accessibility Guidelines (WCAG) to make the website usable by a diverse audience.

Engagement and Interactivity: Incorporate interactive features that encourage engagement. This could include features like discussion forums, comment sections, online forms for inquiries, and options for user-

generated content, fostering a sense of community.

Mobile Responsiveness: Ensure that the website is responsive and works well on various devices, including desktops, tablets, and smartphones. Mobile responsiveness is crucial for reaching a wider audience and providing a seamless browsing experience.

Security: Implement robust security measures to safeguard user data and the website itself. Regularly update software, use secure protocols (HTTPS), and protect against common web vulnerabilities.

Feedback Mechanism: Maintain a user feedback mechanism on the website to collect suggestions, comments, and concerns. This can aid in continuous improvement and identify areas that may need further attention.

Analytics and Tracking: Integrate website analytics tools to gather insights into user behavior, popular pages, and user demographics. These insights can guide decisions for improving the website over time.

Training and Support: Provide training and support for content creators and administrators who will manage the website. A well-trained team can ensure the website remains current and effectively serves its purpose.

1.*Future Enhancements*: Consider the potential for future enhancements such as integrating social media feeds, developing mobile apps, or incorporating multimedia content like videos and interactive presentations.

2. *Collaboration and Partnerships*: Explore opportunities for collaboration with other departments or institutions to further enrich the website's content and offerings.

3. *Regular Evaluation*: Continuously assess the website's performance and user satisfaction. Gather feedback from users and stakeholders to identify areas for improvement and refine the website's features.

REFERENCES

Abrahamson (2015) and Steele (2016). Evaluating the Effectiveness of College Web Sites for Prospective Students. Journal of Higher Education, 55(3), 123-145

Ali Rezaeean, Sona Bairamzadeh and Alireza Bolhari (2012). The Importance of Website Innovation on Students' Satisfaction of University Websites | https://www.researchgate.net/publication/265425954_The_Importance_of_Website_Innovation_on_Students'_Satisfaction_of_University_Websites#:~:text=Results%20of%20the%20empirical%20analysis,perceive%20the%20system%20is%20usable.

Cebu Web Maker (2021). Importance of Website in Schools | https://cebuwebmaker.com/information-technology/importance-of-website-in-schools/

Carroll, Stella (2020). Why a School Website is Important in 2020. | https://dmacmedia.uk/blog/school-website-important/

Miller, Adsit & Miller, (2015). Evaluating the importance of common components in school- based websites: Frequency of appearance and stakeholder, judged value | https://studymoose.com/review-of-related-literature-about-school-website-essay Figure 1: https://targettrend.com/agile-methodology-meaning-advantages-disadvantages-more/

Shaik (2016). The Role of an Educational Website in Providing Better Opportunities for Kabul Education University | https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1004&context=cie_capstones