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Design, Development and Testing of a Human Resource Information System (HRIS) for Cagayan State University - Aparri Campus

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ABSTRACT

The traditional method of managing human resources involves manual processes that are prone to inefficiencies, errors, and delays, requiring substantial time and effort to maintain. This issue significantly affects the administrative functions of human resource officer within the campus, resulting in decreased productivity and employee dissatisfaction. The project titled "Design, Development, and Testing of a Human Resource Information System (HRIS) for Cagayan State University - Aparri Campus" addresses these challenges by providing a web-based HRIS that streamlines HR functions and enhances operational efficiency. The system is designed for quick data entry and retrieval, providing a more organized and efficient means of managing personnel records. The Agile Development Model, implemented within the established framework of the System Development Life Cycle (SDLC) was used. The assessment of the HRIS developed at CSU Aparri shows it as a robust and effective system, meeting ISO 25010:2011 standards. IT experts rated it highly across compatibility, security, usability, functionality, performance stability, maintainability, and portability. Compatibility and security were particularly praised for their adaptability and stringent data protection. While usability scored slightly lower, it still indicates efficient navigation and user satisfaction. End-users reported high satisfaction, perceiving the HRIS as beneficial and expressing strong intentions to continue using it. These results affirm the HRIS's success in meeting IT and user needs, highlighting its reliability, security, and overall effectiveness, with room for further usability enhancements. The application ultimately contributes to better decision-making and improved administrative efficiency.

Keywords: *human resource information system, HRIS, ISO 25010, SDG9, TAM*

I. Introduction

In today's fast-paced environment, organizations face numerous challenges in managing their human resources effectively. Traditional manual systems often lead to inefficiencies, errors, and delays, resulting in decreased productivity and employee dissatisfaction. There is a pressing need for a comprehensive Human Resource Information System (HRIS) to streamline these critical functions. This study focuses on the design, development and testing of an HRIS for the Cagayan State University - Aparri Campus (CSU-Aparri Campus).

Modern technology must be integrated into academic institutions to enhance operational efficiency and foster growth. As a provider of high-quality education, CSU-Aparri Campus recognizes the importance of efficient HR management in developing its workforce. However, the current HR systems rely on outdated manual procedures, posing challenges in decision-making accuracy and compliance.

The HRIS project aligns with the Philippine Development Plan 2017-2022, particularly in building socio-economic resilience. By enhancing the efficiency and accuracy of HR processes, the project contributes to the goals of decent work and economic growth (SDG 8), industry innovation and infrastructure (SDG 9), and quality education (SDG 4).

This project, titled "Design, Development, and Testing of a Human Resource Information System," aims to address these challenges by creating a robust HRIS tailored to the specific needs of the CSU-Aparri Campus. The proposed system will offer a centralized

International Journal of Arts, Sciences and Education
Volume 5 Issue 2 | June 2024
ISSN: 2799 - 1091
Page No. 136-143

platform for managing personnel data, facilitating seamless communication within the university, and ultimately enhancing the efficiency and accuracy of HR processes at CSU-Aparri Campus.

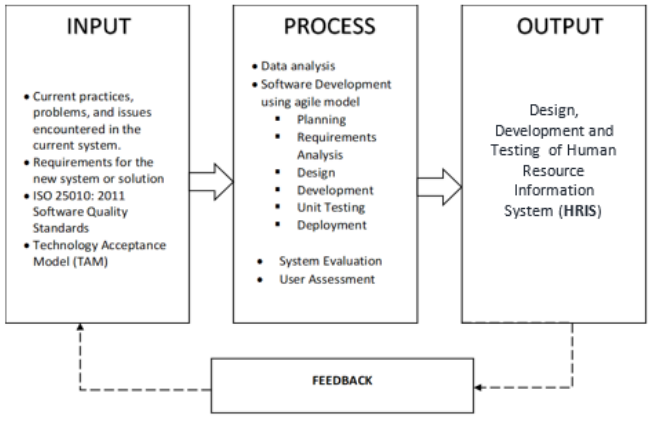
Objectives of the Study

This study entitled "Design, Development and Testing of Human Resource Information System (HRIS) for Cagayan State University – Aparri Campus" generally aimed to:

1. determine the current practices, policies, problems, and issues encountered in systematizing human resources at CSU-Aparri
2. design, develop and test a solution to address the problems and issues in the current system
3. determine how do the proposed system fair as per IT experts' assessment using the ISO 25010:2011 Software Quality Standards, and
4. determine the assessment of the end-users/intended users on the proposed project using the Technology Acceptance Model.

The study is guided by the ISO 25010 software quality framework for ensuring quality in developed information systems. In addition, understanding user acceptability and usability of systems following the Unified Theory of Acceptability and Usability of Technology has guided the design, development, and testing of the HRIS.

Figure 1. Input-Process-Output (IPO Model)



The Input-Process-Output (IPO) Model structures system development into three stages: Input, Process, and Output. The Input stage involves identifying current system issues, gathering new system requirements, adhering to ISO 25010 standards, and considering user acceptance through the Technology Acceptance Model (TAM). In the Process stage, data analysis and agile development transform these inputs through planning, requirements gathering, analysis, design, development, testing, deployment, system evaluation, and user assessment. Finally, the Output is the completed design, development, and testing of the Human Resource Information System (HRIS), with continuous feedback loops for system refinement and improvement.

This project focused on determining what system or solutions is to be developed to provide an easy and effective information system. This will include managing employee information, leave applications, training/seminars, and certificates.

The project is limited to the creation of the project "Design, Development and Testing of Human Resource Information System (HRIS) for Cagayan State University – Aparri Campus – a system where it manages information of employee, leave applications, training/seminars, and certificates, research reports (IMRAD) and can be accessed by future student researchers that need references or idea for their research or capstone project", available online and accessible via desktop, computers, laptop and mobile phones.

II. METHODOLOGY

A. Research Design

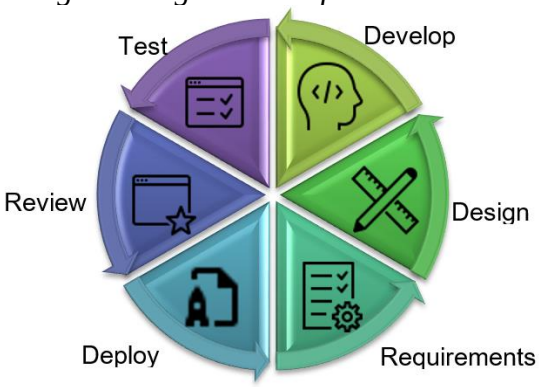
The study implemented a descriptive-development research design. Specifically, the descriptive tools described the assessment of the extent of compliance to ISO 25010:2011 and the indicators of the TAM.

The Agile development models shows the researcher's way of implementing the system in Cagayan State University- Aparri Campus, "Design, Development and Testing of Human Resource Information System for CSU-Aparri", the Cycle covers the process in the

International Journal of Arts, Sciences and Education
Volume 5 Issue 2 | June 2024
ISSN: 2799 - 1091
Page No. 136-143

making of the study.

Figure 2. Agile Development Model



B. Locale of the Study

The research took place at the Aparri Campus of Cagayan State University. The campus is home to more than 5 thousand students and more than 100 faculty members and personnel. Situated in the northern tip most of Luzon Philippines, the Aparri Campus is one of the 8 key campuses of the University.

C. Participants of the study

The key participants in the design and development are the select faculty members and personnel, the HRMO, and the HRMA. Their responses taken through interview and observation has helped the research to clearly grasps the processes, policies, problems, and procedures involved in the HR processes. In the assessment of the developed HRIS, 10 IT experts were invited to make their honest assessments. Most of them have at least 2 years of experiences in programming, databases, and web development. Evaluating using the TAM indicators, the HR staff and 10 selected faculty members and personnel made their inclusion in the assessment.

D. Data Gathering Tools and Instruments

The study made use of survey-questionnaires, interview guide, observation and document checklist to understand the processes involved in the HR Office. An Evaluation Questionnaire – (1) the ISO 25010:2011 for the IT Experts and (2) the Technology Acceptance Model for Users was maximized during the testing and evaluation of the developed HRIS.

III. RESULTS AND DISCUSSIONS

Current practices, policies, problems, and issues encountered in systematizing human resources at CSU-Aparri

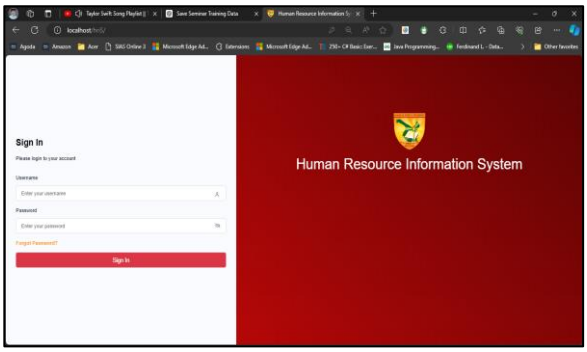
Based on the data-gathering activities laid down through observation notes and casual interviews, the following are the current practices, issues, policies, and problems encountered by faculty and staff:

1. Manual Processes:
   - Managing employee information, leave applications, training requests, and certificate issuance is time-consuming and prone to errors due to reliance on paper forms and spreadsheets.
   - Tracking employee attendance and updating records require significant manual effort, leading to inaccuracies and delays.
2. Lack of Integration:
   - Different HR functions operate in silos, lacking an integrated system.
   - This results in fragmented information and potential discrepancies in employee records.
3. Limited Support for Continuous Learning:
   - The current system does not adequately support continuous learning and skill enhancement.
   - Manual tracking of training requests and histories impede professional growth and satisfaction of employees.

The Developed System: Human Resource Information System (HRIS) for CSU-Aparri

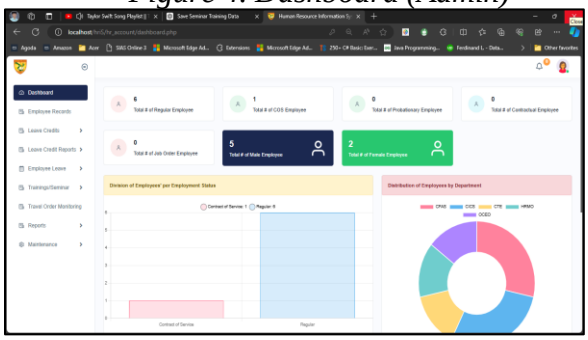
Figure 3. Login Page

International Journal of Arts, Sciences and Education
Volume 5 Issue 2 | June 2024
ISSN: 2799 - 1091
Page No. 136-143



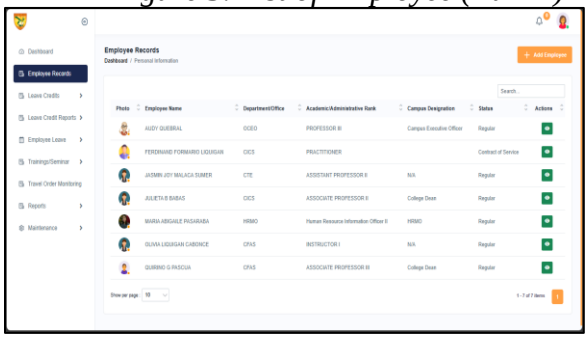
The figure above shows the login page of the developed system. The user log their login credentials like username and password and the system automatically traced user's level.

Figure 4. Dashboard (Admin)



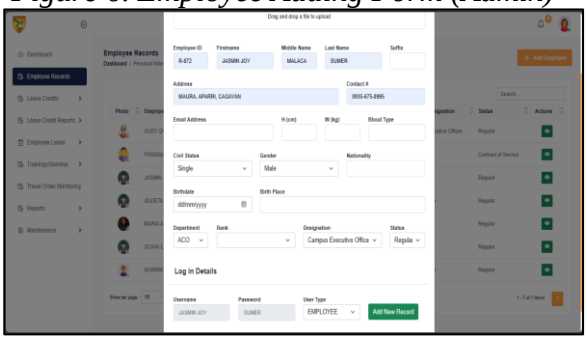
This HR dashboard page provides a comprehensive and visually appealing overview of employee data at CSU-Aparri as shown in Figure 3. It combines tabular data with visual charts and summary cards, offering an intuitive interface for HR personnel to monitor and analyze key workforce metrics effectively.

Figure 5. List of Employee (Admin)



The figure above shows the list of employees of CSU-Aparri.

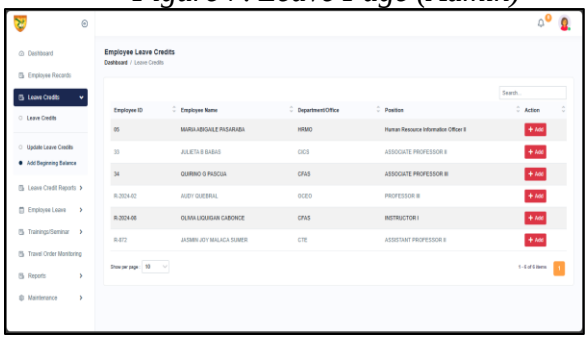
Figure 6. Employee Adding Form (Admin)



The figure above shows the form filled out by the admin in adding employees to the system.

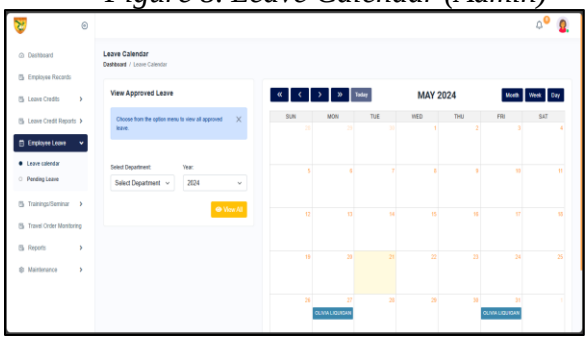
International Journal of Arts, Sciences and Education
Volume 5 Issue 2 | June 2024
ISSN: 2799 - 1091
Page No. 136-143

Figure 7. Leave Page (Admin)



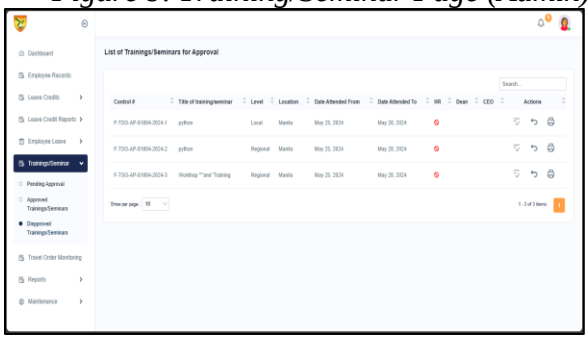
The figure above shows the leave credits and balances of employees.

Figure 8. Leave Calendar (Admin)



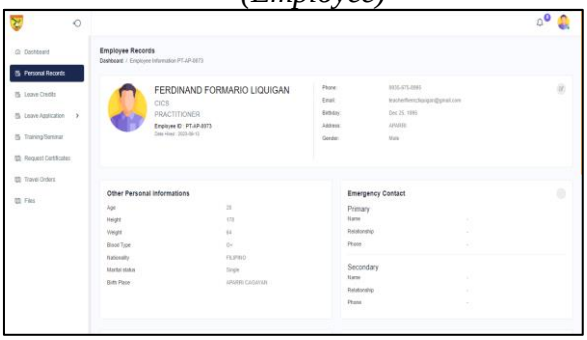
The figure above shows the admin's calendar in which monitors the employee on leave.

Figure 9. Training/Seminar Page (Admin)



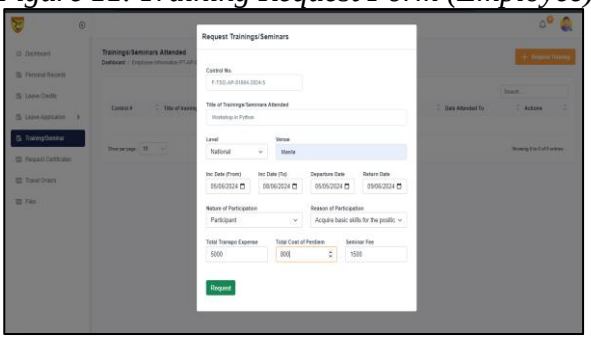
The figure above shows the approved and disapproved trainings/seminars requested by the employee.

Figure 10. User's Information Page (Employee)



The figure above shows the information of user in which can be updated and be printed as Personal Data Sheet (PDS).

Figure 11. Training Request Form (Employee)



The figure above shows the process of requesting trainings from the HR.

RESPONDENTS OF THE STUDY

Table 1. Summary of the respondents of the study

Participants	Frequency (n)	Percentage (%)
HR Officer	2	5.71
Employee	15	42.86
Office Head	8	22.86
IT Expert	10	28.57
Total	35	100

The researcher used a purposive sampling method as a basis in identifying respondents for the study. Ten

(10) IT Experts, fifteen (15) Employees, two (2) Human Resource Management Office staff, and eight (8) office heads including the CEO of CSU-Aparri, a total number of 35 respondents.

The extent of compliance to ISO Standards as assessed by the IT Experts.

Table 2. Summary of Assessments of the IT Experts

Criteria	IT Experts	
	WM	**DV**
1. Functional Suitability	4.70	VHE
2. Performance Stability	4.63	VHE
3. Compatibility	4.73	VHE
4. Usability	4.57	VHE
5. Reliability	4.60	VHE
6. Security	4.63	VHE
7. Maintainability	4.50	VHE
8. Portability	4.60	VHE
Overall Mean	**4.60**	**VHE**

The Table 2 summarizes that the system was given a 4.60 weighted mean after being evaluated by IT experts and industry professionals, which indicates that the level of compliance of the system on ISO 25010:2011 is very high extent.

User Acceptance of the Developed System using the Unified Theory of Acceptance and Use of Technology

Table 3. Summary of Assessments of the end-user/s/intended user

Statement	End-User/s	
	WM	**Interpretation**
Perceived Ease of Use	4.71	SA
Perceived Usefulness	4.78	SA
Self-Efficacy	4.76	SA
Response Efficacy	4.80	SA
Adoption Intentions	4.82	SA
Overall Mean	**4.77**	**SA**

The Table 3 summarizes that the system was given 4.77 weighted mean after being evaluated by the intended end- users, which indicates that the level of compliance of the system on Technology Acceptance Model is strongly agree.

The CSU Aparri HRIS project is in good accordance with the body of knowledge on HR information systems. High acceptance is demonstrated by user ratings, which are typified by perceived usefulness and simplicity of use. These results align with Gupta and Jana's (2016) findings and lend support to the UTAUT model (Mabaso, 2018).

One of its main advantages is security, which is consistent with Islam et al. (2015)'s focus on information security in HRIS. Impressive functionality and performance stability are also displayed by the HRIS, which aligns with the functions described by Kavanagh, Thite, and Johnson (2018) as well as the dependability characteristics stressed by Alshammari et al. (2018). High compatibility and portability of the system are in line with the significance of these features as noted by Islam et al. (2015) and Al-Qutaish et al. (2017). According to research by Islam et al. (2015) and Alshammari et al. (2018), the observed ease of maintenance contributes to long-term use and cost-effectiveness.

Usability scores are marginally lower than overall user acceptance, suggesting room for development and supporting Gupta and Jana's (2016) focus on

ISSN: 2799 - 1091
Page No. 136-143

usability as a means of achieving user happiness. In spite of this, Kim & Lee (2011) and Ahmed and Siraj (2019) attest to the CSU Aparri HRIS's excellent efficacy and beneficial organizational impact.

Despite the fact that previous research (Kavanagh, Thite, and Johnson 2017) emphasizes possible obstacles to adoption and training, this case's high user acceptability points to successful mitigation, either via efficient training or user-friendly design.

In summary, the CSU Aparri HRIS project is in good alignment with previous studies, especially when it comes to organizational impact, system effectiveness, and important usability and security issues. Additional usability enhancements may also boost overall effectiveness.

IV. CONCLUSIONS

The assessment of the HRIS developed at CSU Aparri shows it as a robust and effective system, meeting ISO 25010:2011 standards. IT experts rated it highly across compatibility, security, usability, functionality, performance stability, maintainability, and portability. Compatibility and security were particularly praised for their adaptability and stringent data protection. While usability scored slightly lower, it still indicates efficient navigation and user satisfaction. End-users reported high satisfaction, perceiving the HRIS as beneficial and expressing strong intentions to continue using it. These results affirm the HRIS's success in meeting IT and user needs, highlighting its reliability, security, and overall effectiveness, with room for further usability enhancements.

V. RECOMMENDATIONS

The researcher recommended the following:

1. Conduct UX studies to identify and address usability improvements based on user feedback.
2. Establish continuous monitoring and maintenance with regular updates to ensure system stability, security, and compatibility.
3. Provide comprehensive training and ongoing support, including user manuals, tutorials, and helpdesk services, to boost user proficiency.
4. Implement a feedback mechanism to gather ongoing user input for future updates and system enhancements.

VI. ACKNOWLEDGEMENT

I'm immensely grateful for the unwavering support from my family, especially my parents, and for the invaluable guidance of Dr. Billy S. Javier, my advisor. I would also like to thank Department of Science and Technology (DOST - STRAND 2) for their assistance with my master's program. I want to express my sincere gratitude to all of my friends, collaborators, and project participants. Your encouragement and support have been crucial to this amazing trip.

REFERENCES

Ahmed, S., & Siraj, M. (2019). Impact of HRIS on organizational performance: A case study of educational institutions. Journal of Human Resource Management, 12(1), 45-58.

Guiquing, F. (2023). Mapping of Animal Bites in Cagayan Province. Telematique. 22 (01)

Gupta, R., & Jana, D. (2016). HRIS usability and user satisfaction in educational institutions. International Journal of Information Systems, 22(3), 88-102.

Islam, N., Khan, I., & Rahman, M. (2015). Key quality characteristics of HRIS in the context of educational institutions. Software Quality Journal, 23(4), 765-789.

Kavanagh, M. J., Thite, M., & Johnson, R. D. (2018). Human Resource Information Systems: Basics, Applications, and Future Directions. Sage Publications.

Kim, S., & Lee, H. (2011). The impact of HRIS on the efficiency of HR management. Journal of Organizational Studies, 10(2), 120-133.

ISSN: 2799 - 1091
Page No. 136-143

Mabaso, C. (2018). Predicting HRIS acceptance using the Technology Acceptance Model. Journal of Information Technology Management, 29(1), 112-126.

Villa, F. (2021). Bench Test of Multi-Function Coconut Husk Processing Machine. Academy of Acounting and Financial Studies Journal. 25(3),1-7.

Villa, F. (2021). Time-series Forecasting of COVID-19 cases using stocked-long short-term memory networks. 2021 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT), 435-441.

BIONOTE

Ferdinand F. Liquigan is a dedicated graduate student pursuing an MS in Information Technology at Cagayan State University - Aparri Campus. Hailing from Paddaya, Aparri, Cagayan, he excels academically and professionally.

As a DOST STRAND scholar, he leverages this opportunity to deepen his IT expertise and contribute to national development. He also serves as a part-time faculty member at CSU-Aparri, sharing his passion for technology with undergraduate students.

Ferdinand's blend of scholarly achievement, practical experience, and commitment to service makes him a dynamic and influential figure in his field, poised to make significant contributions to the technological and educational landscape of his region.