

Redesigning ADNU-HR Information System: Migrating Internal Processes Through a Customized Strategic Web Application.

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Department of Computer Science
College of Computer Studies, Ateneo de Naga University
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Declaration of Original Work

We declare that the Senior Project entitled

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which we submitted to the faculty of the

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is our own work. To the best of our knowledge, it does not contain materials published or written by another person, except where due citation and acknowledgement is made in our senior project documentation. The contributions of other people whom we worked with to complete this senior project are explicitly cited and acknowledged in our senior project documentation.

We also declare that the intellectual content of this senior project is the product of our own work. We conceptualized, designed, encoded, and debugged the source code of the core programs in our senior project. The source code of third party APIs and library functions used in our program are explicitly cited and acknowledged in our senior project documentation. Also duly acknowledged are the assistance of others in minor details of editing and reproduction of the documentation.

In our honor, we declare that we did not pass off as our own the work done by another person. We are the only persons who encoded the source code of our software. We understand that we may get a failing mark if the source code of our program is in fact the work of another person.

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ABSTRACT

One of the main challenges of the Ateneo De Naga University is the major limitation of the current Human Resource (HR) legacy system hindering efficient and streamlined HR processes. To resolve this is to propose a new redesign and implementation of a new Human Resources Information System (HRIS) at Ateneo de Naga University to address the limitations of the current legacy system. The study aims to centralize and standardize personal information management across departments, ensuring data integrity and efficiency in HR processes. The project involves a thorough analysis of the current HRIS, identifying unique cases different from other systems, designing a modernized application with standardized data elements, and executing a robust data migration strategy with the University's Integrated Information System (UIIS). The significance of this study lies in improving personnel information management, increasing efficiency in branch administration, and promoting centralized authority and standardized procedures. With this new HRIS, operational workflow is streamlined for HR personnel, employees, and administrators, enhancing transparency, and efficiency with HR records, and maintaining accurate, complete, and reliable data by reducing errors of inconsistencies and data redundancies ensuring integrity.

We dedicate this research work to all of humanity.

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Chapter 1

Introduction

Human Resource Management (HRM) plays an important role in the success and efficiency of institutions. HRM is responsible for managing the most valuable asset of any organization—its people. The primary functions of HRM include recruitment, training, development, performance management, and employee relations. These functions are essential for building a productive and thriving workforce, which is crucial for achieving organizational goals and maintaining a competitive edge in the market [13, 42].

HR professionals act as strategic partners to the management team, advising on managing human resources effectively to meet the institution's current and future needs. They are involved in developing strategies for talent acquisition, employee retention, and skill development, ensuring the workforce is aligned with the organization's objectives. Additionally, HRM plays a significant role in fostering a positive work environment, enhancing employee engagement, and building loyalty and commitment among employees [11, 56].

A Human Resources Information System (HRIS) is a software solution designed to manage and automate core HR processes. HRIS serves as a centralized repository for employee data, facilitating efficient data management, payroll processing, benefits administration, time and attendance tracking, and performance management [19, 36]. The implementation of an HRIS transforms HR from an administrative function to a strategic one, enabling HR professionals to focus on more value-added

activities such as strategic planning and decision-making [49].

By automating routine HR tasks, HRIS reduces the administrative burden on HR professionals, allowing them to allocate more time to strategic initiatives. This automation leads to increased efficiency, accuracy, and compliance with labor laws and regulations. Moreover, HRIS provides real-time data access and advanced analytics capabilities, which are essential for informed decision-making and strategic workforce planning [2, 52].

HRIS also enhances the employee experience by offering self-service portals where employees can access and update their personal information, request time off, and manage their benefits. This not only improves employee satisfaction but also reduces the workload on HR staff. Furthermore, the integration of HRIS with other business systems ensures seamless data flow and consistency across the organization, contributing to overall operational efficiency [30, 5].

1.1 Project Context

The Human Resource and Management Office (HRMO) at Ateneo de Naga University has been utilizing a system that has served the institution well over the years. This system, consisting of disparate databases and applications, has been instrumental in managing HR processes and maintaining employee records. However, as the university has grown, the limitations of this system have become more apparent. The separation of the HRIS schema from the University Integrated Information Systems (UIIS) has led to challenges such as data duplication and the need for more streamlined processes. These issues can hinder the effectiveness of HR operations, making it difficult to manage the increasing volume of data and integrate with other university systems.

To address these challenges and support the university's continued growth, there is a need to develop and implement a centralized HRIS. This new system will ensure data consistency, accuracy, and accessibility, thereby streamlining HRMO processes and improving overall data management. The centralized HRIS will also facilitate better integration with other university systems, enhancing the institution's ability to manage HR data comprehensively and efficiently. The new HRIS will be designed to interact seamlessly with various stakeholders within the university. HRMO personnel will be responsible for data entry, managing employee records, and processing HR-related tasks. University management will access HR data for decision-making and strategic planning. Other

departments requiring HR data for various administrative and operational purposes will also benefit from the new system.

The study will involve key stakeholders who will provide valuable insights and feedback throughout the project. HRMO personnel, with their firsthand experience with the current system, will help identify areas for improvement and define requirements for the new HRIS. MIS office personnel, with their technical expertise, will be crucial in designing and implementing the new system. University management will ensure that the new HRIS aligns with the institution's overall goals and objectives. The new HRIS will handle various types of data to support HR operations. Input data will include employee records, attendance data, leave applications, and other HR-related information. Output data will consist of reports on employee information, attendance, leave status, and other HR metrics. These reports will be essential for decision-making, compliance, and strategic planning.

1.2 Purpose and Description

The main purpose of the project is to redesign, develop and implement a centralized Human Resource Information System (HRIS) to enhance data management, streamline HR processes, and support the university's growth. This initiative aims to address the limitations of the current system by providing a more integrated and efficient solution that meets the evolving needs of the institution.

The project will begin with an information-gathering and system analysis phase. This initial phase will involve collecting detailed feedback from HRMO personnel, university management, and other stakeholders to understand the current system's limitations and requirements. Analyzing the existing system will help identify specific areas that need improvement and features that should be incorporated into the new HRIS. Following the analysis, the project will proceed with the design and development of the new HRIS. This includes creating modules for attendance monitoring, leave management, user authentication, and report generation.

The new system will be designed to accommodate the current requirements that the current system was unable to fully support. Additionally, the project will focus on redesigning HR workflows to make them more efficient and user-friendly. Integration with other university systems will be a key component, ensuring seamless data flow and accessibility across different departments. Finally, the project will involve migrating existing employee data to the new HRIS, ensuring that no valuable

information is lost in the transition.

The new HRIS will bring substantial benefits to various stakeholders within the university:

HRMO personnel. The new HRIS will significantly improve data integrity and streamline HR processes, allowing HRMO staff to manage employee information more effectively. This will reduce the time spent on manual data entry and corrections, enabling staff to focus on more strategic HR activities.

University Management. University management will benefit from enhanced reporting and analytics capabilities provided by the new HRIS. This will facilitate better decision-making and strategic planning by providing accurate and up-to-date HR data.

Employees. Employees will experience more efficient HR services, such as faster processing of leave applications and more accurate attendance tracking. The user-friendly interface of the new HRIS will also make it easier for employees to access and update their personal information.

Departments. Other departments that require HR data for various administrative and operational purposes will benefit from the improved data accessibility and integration with other university systems. This will ensure that all departments have access to consistent and accurate HR information.

The University. The university will benefit from a scalable system that supports future growth and integration needs. The new HRIS will facilitate easier access, management, and reporting of employee data, thereby enhancing overall operational effectiveness. By addressing the limitations of the current system, the new HRIS will provide a robust foundation for the university's HR operations, supporting its mission and strategic goals.

1.3 Objectives

The main objective of the study is to redesign and implement the core Human Resource Information System (HRIS) functionalities for the Ateneo de Naga University. In order to achieve the main objective, the following objectives must be accomplished:

1. Collect and document data requirements to ensure they align with stakeholders' needs and project goals.
2. Create design specifications for each system component and module, including data models and interfaces.
3. Review and confirm the proposed system design with stakeholders to ensure it meets project requirements.
4. Develop and implement the functionality of modules based on the defined design and requirements.
5. Gather feedback from stakeholders on the functionality and usability of all modules.
6. Review the completed work from each iteration and demonstrate the new features to stakeholders.
7. Assess the system's functionality, performance, and user experience.
8. Ensure the system meets the needs and expectations of the end-users.
9. Conclude the testing phase and prepare test reports summarizing testing activities and results.
10. Prepare the system and infrastructure for deployment to ensure a smooth transition to production.
11. Deploy the system to the production environment.
12. Develop comprehensive training materials and documentation to support end-user training.
13. Finalize detailed technical specifications documenting the system architecture, design, and implementation details.

1.4 Scope and Limitation

The project is focused on redesigning the Human Resource Information System (HRIS) to address the limitations of the current system and to meet the evolving needs of the university. The project

will primarily concentrate on HR processes such as enhancing employee information management, streamlining performance evaluations, improving training and development tracking, maintaining comprehensive health and safety records, automating administrative tasks like generating certificates of employment and employment contracts, monitoring employee status and assignments, managing academic awards and faculty ranks, and facilitating report generation. The project shall also include the migration from the current system to UIIS. This includes covering data migration of records from the previous schema to migrating to the new HR schema and transitioning from the current system's Database Management System – MySQL to Oracle.

Additionally, the system will include functionalities for managing staff attendance and work schedules, handling leave applications and leave credits, and managing faculty attendance and schedules in connection with the integration of ADNU-ONE which cover these modules. This ensures that the new system is robust, user-friendly, and capable of handling the university's current and future requirements. The project will begin with gathering information and analyzing the existing system to identify its limitations and areas for improvement. This analysis will inform the design and development of the new HRIS, which will include several key modules.

The modules to be developed include:

User Authentication and Authorization Module. This module is essential for providing secure access mechanisms to ensure that only authenticated users have appropriate permissions within the HRIS. It will utilize GBOX accounts for user authentication, which offers easy access and enhanced security, thereby improving the overall user experience. By integrating GBOX, the system ensures that users can seamlessly log in using their existing credentials, reducing the need for multiple passwords and enhancing security through centralized authentication.

User Privileges. The User Privileges module will offer comprehensive administrative tools for managing users, base tables, and other system settings. This module is crucial for security purposes as it ensures that users have the appropriate access levels and permissions based on their roles within the organization. By carefully managing user privileges, the system can prevent unauthorized access to sensitive information and maintain data integrity.

HRIS Modules. These modules will contains functionalities to manage HR processes such as:

Employee Information Management: Storing and managing personal and professional information of employees.

Performance Evaluations: Streamlining the process of evaluating employee performance to ensure accurate and timely assessments.

Training and Development Tracking: Recording and tracking training sessions attended by employees to support their professional growth.

Health and Safety Records: Maintaining comprehensive health records to ensure the well-being of employees and compliance with health regulations.

Administrative Tasks: Generating certificates of employment and employment contracts to reduce administrative burden and improve accuracy.

Monitoring Employee Status and Assignments: Tracking status movements and job assignments of employees to ensure proper record-keeping and organizational structure.

Managing Academic Awards and Faculty Ranks: Handling academic awards and faculty ranks to recognize and incentivize employee achievements.

TIMESYS: Attendance Monitoring (Staff) Modules. These modules will handle the monitoring and recording of staff attendance. They include functionalities such as capturing login and logout times, processing raw attendance data, managing work schedules, and computing overtime. By accurately tracking attendance, the system can ensure compliance with work schedules and provide reliable data for payroll and performance evaluations.

FACSYS: Attendance Monitoring (Faculty) Modules. The FACSYS modules will manage the monitoring and recording of faculty attendance. This includes tracking attendance by semester and school year, managing faculty schedules, and processing attendance reports. These modules ensure that faculty attendance is accurately recorded and reported, facilitating compliance with academic schedules and workload requirements.

LEAVESYS: Leave Management. This module will manage employees' leave applications and processing. It includes storing approved leave applications, tracking leave reasons and

credits, and processing leave applications with leave credits reports. By automating leave management, the system can streamline the approval process, ensure accurate tracking of leave balances, and provide valuable data for decision-making.

Optimized Reports Generation. The current system lacks optimization on their reports causing delays in report generation. With this, the project aims to allow users to set parameters for reports, generate report outputs in various formats such as CSV, Excel, or PDF, and export reports efficiently for faster further analysis and record-keeping. This functionality ensures that users can easily generate and access the data they need for strategic decision-making, compliance reporting, and operational analysis.

Given the wide scope of this project, the focus will be the modules mentioned, with room for scalability to accommodate additional features for the employee view in the future. The project does not include the development of new hardware infrastructure, as it will utilize existing university resources. Additionally, modules unrelated to HR processes, such as financial management or student information systems, are not within the scope of this project.

By concentrating on these areas, the project aims to create a centralized HRIS that enhances data management, streamlines HR processes, and supports the university's growth. The new system will provide a scalable and integrated solution that addresses the limitations of the current system, ultimately benefiting all stakeholders involved.

Chapter 2

Review of Related Systems and Literature

This chapter provides the relevant literature that is essential for developing a better understanding of the problem of the study and the significance of its resolutions. Additionally, existing features and/or systems that can assist in resolving this issue are identified. Researchers found it beneficial to evaluate the gaps in existing systems as it guides in determining the features that a system should have to successfully solve the problem of the study.

2.1 Review of Related Literature

Human Resource Information Systems (HRIS) has undergone significant transformation, driven by technological advancements and evolving organizational needs. This literature review provides a foundational understanding of HRIS and its historical progression over time from basic HR processes to complex systems that support a wide range of HR-related tasks. It emphasizes how essential HRIS is to improving corporate effectiveness, simplifying HR procedures, and enabling data-driven decision-making. It also includes the current trends as well as how the progression of technology influences the future of HRM systems.

2.1.1 Definition and Scope

Technological developments and the change of requirements of organizations on the effective management of their human resources have a significant impact on the evolution of the Human Resources Information System. The primary functions of the early HRIS are focused on payroll processing and employee record-keeping [27]. As time passes, these systems have grown into complex platforms which now include several HR duties such as hiring, training, performance management, and analytics [28].

The historical development of HRIS appears to date back more than six decades, where the emergence of mainframe systems that support the basic HR functions such as payroll processing and government reporting [27]. Organizations' strategies in managing their human capital have begun to change as these early technologies paved the way for the integration of HR procedures onto digital platforms. As technology advances, the HR departments adopt advanced HRIS, which effectively improves data management, reporting, and decision-making capabilities [28]. The way that HRIS has evolved indicates a change towards the idea of utilizing technology to improve organization efficiency of organizations and streamline HR processes.

The HRIS's main components and functionality include a wide range of functionalities that are designed to support various aspects of HR administration. These often include modules for managing employee information management, payroll processing, benefits administration, recruitment, training, and performance evaluation [39]. The core of an HRIS is a centralized repository, which offers a secure and readily available platform for handling and storing personnel data [12]. Furthermore, analytics tools are frequently integrated into modern HRIS systems, allowing businesses to get knowledge from HR data and decide on workforce planning and development [4].

2.1.2 Importance of HRIS in Organizations

Human Resources Information Systems (HRIS) are valuable in organizations, offering numerous advantages to organizations and improving HR operations. HR operations are made more efficient by the use of HRIS, which play an essential part in simplifying everything from performance management to recruitment. HR departments may function more effectively and efficiently using HRIS by centralizing employee data and automating repetitive processes [46]. Since it enables HR

professionals to concentrate on strategic initiatives rather than administrative responsibilities, the integration of HRIS has become essential to the success of organizations, thereby improving the overall operational efficiency [3].

In addition, the advantages of using HR Information Systems for organizations go beyond operational enhancements and extend to strategic advantages. By offering real-time insights into workforce dynamics and performance measures, HRIS enables data-driven decision-making [25]. Organizations can determine skill shortages, streamline their staff management plans, and match HR activities with corporate goals by utilizing HR's information. Furthermore, HRIS improves regulatory compliance and fosters HR process transparency, which in turn cultivates an organizational culture of responsibility and fairness [1].

It has been demonstrated that implementing HR systems can substantially improve an organization's efficiency. HRIS simplifies operations and lessens the administrative burden on HR professionals by centralizing HR data and automating manual procedures [53]. By integrating self-service substitutes for activities like leave management and performance assessments, this transition towards digital HR administration improves not just the accessibility and accuracy of data but also the entire experience of employees [20]. Thus, implementing HRIS is a strategic investment that helps businesses maximize their HRM procedures and achieve superior results in terms of hiring, developing, and managing people [54].

2.1.3 HR in Educational Institutions

The challenges associated with human resources in educational institutions are complex and demand considerable planning in order to guarantee efficient people management. Recruitment, retention, professional development, and performance evaluation of professors and staff are issues that educational institutions frequently face [21]. These challenges may have an influence on the overall quality of education provided and the efficiency of the institution. Resolving these HR issues is essential to creating an effective environment for learning and encouraging continuous growth in educational institutions.

Same as other institutions, HRIS improves the HR operations and decision-making procedures in educational institutions. Educational institutions can improve data accuracy, expedite administrative

procedures, and support strategic workforce planning through the use of HRIS [16]. With the use of HRIS, educational institutions may automate repetitive HR tasks, consolidate employees' data, and provide insightful data that helps with well-informed decision-making. The implementation of HRIS in educational environments enhances organizational performance overall, regulatory compliance, and operational efficiency.

The implementation of HRIS in educational institutions is an important initiative meant to improve organizational performance and modernize HR procedures. Technology is integrated to improve data management, expedite HR procedures, and increase communication within the organization when HRIS is used in educational settings [58]. Educational institutions may analyze employee performance, allocate resources more efficiently, and match HR initiatives with academic objectives by utilizing HRIS. Better teaching and learning results, more staff satisfaction, and increased operational efficiency can all result from the effective adoption of HRIS in educational institutions.

2.1.4 Challenges in HRIS Implementation and Management

Organizations have many challenges in the implementation and management of Human Resources Information Systems (HRIS) when they adopt and maintain these systems. Employee resistance, unreasonable requirements, change management, the requirement for training, and setting up the proper IT infrastructure are common problems encountered during HRIS implementation [24]. These challenges must be carefully planned for and handled with strategic management in order to prevent HRIS from being implemented improperly. Research has indicated that resolving these issues is crucial to guaranteeing that HRIS is used in businesses in an efficient manner [53].

For businesses looking to streamline their HR procedures, maintenance and upgrade challenges in HRIS implementation and management present further challenges. Maintaining the operation and relevance of HRIS systems requires regular maintenance and timely upgrades [55]. Organizations frequently struggle with issues like user training, technical support, data quality maintenance, and system upgrades. To optimize the advantages of HRIS and guarantee its continuous efficacy in assisting HR activities, it is important to overcome this maintenance and upgrade barriers [41].

2.1.5 Trends in Human Resources Information Systems

Technological advancements have had an enormous impact on HR information systems, affecting how businesses manage their human resources and streamline HR procedures. HRIS is evolving into a more complex system with the integration of Artificial Intelligence, Machine Learning, and Deep Analytics, allowing predictive analytics for workforce planning, personalized learning and development plans, and improved recruitment tactics [45]. These developments in technology are triggering a change in HR practices toward ones that are more data-driven and flexible, enabling firms to quickly respond to changing business requirements and make well-informed decisions.

Enhancing user experience, using data analytics for decision-making, and integrating AI-driven solutions for automation and efficiency are the three main objectives of recent advances in Human Resources Information Systems (HRIS) [14]. Cloud-based HRIS systems are becoming more and more popular among organizations because they provide real-time access to HR data, scalability, and flexibility. Furthermore, the incorporation of mobile HRIS applications facilitates employees' access to HR services at any time and location, hence fostering increased productivity and engagement. These patterns show a move toward more adaptable, user-focused HR procedures that make use of technology to boost business performance.

2.1.6 Redesign Considerations

One of the organizations that need to consider redesigning HRIS is to guarantee a smooth transition. The common reason for redesigning HRIS is because of the need for better operational efficiency, improved data accuracy, and to accommodate business requirements [31]. By HRIS redesign, organizations can improve employee experiences, streamline workforce management procedures, and match HR operations with strategic goals. By identifying the reasons behind the redesign, organizations can establish clear goals and objectives for the HRIS transformation.

The important aspects of HRIS redesign include assessing the limitations of the current system, determining the redesign's objectives, including major stakeholders, guaranteeing data security and compliance, and organizing change management [44]. Important factors to take into account include comprehending the organization's particular HR requirements, assessing the new system's scalability and adaptability, and coordinating the HRIS redesign with organizational objectives. Furthermore,

a successful redesign of HRIS involves carefully choosing the technology, guaranteeing seamless integration with existing systems, and offering users appropriate training and support [23].

Legacy HRIS has to be redesigned in order to take advantage of new features and capabilities according to the influence of the advancement of technology. Organizations are modernizing their HRIS to provide predictive analytics, customized HR services, and task automation via the amalgamation of Artificial Intelligence, Machine Learning, and data analytics [6]. The demand for a complete revamp of HRIS is being driven by technological improvements, which aim to increase operational efficiency, streamline labor management, and facilitate better decision-making. Organizations may foster innovation in HR processes, remain competitive, and adjust to shifting business environments by adopting new technology.

2.1.7 Migration Initiatives

According to Bakar, H. et.al., migration in the context of an information system is defined as the systematic transfer of data, applications, and processes from old systems to new platforms in order to improve operational effectiveness and meet changing business requirements [10]. By reducing the risks connected with outdated technology, enhancing system performance, and guaranteeing compatibility with existing IT infrastructure, migration enables businesses to take advantage of cutting-edge innovations and maintain their edge in today's digital economy.

Re-engineering, re-platforming, and re-hosting are a few common migration techniques that are tailored to the particular requirements of the company and the legacy system being migrated. [8]. Re-platforming is the process of moving programs to a new platform without changing their essential functionality, whereas re-engineering is rewriting the system architecture to adjust to current requirements. Re-hosting, on the other hand, entails transferring the system to a different setting while preserving its present state. With the use of these techniques, companies may select the best course of action depending on variables like system complexity, financial resources, and time frame.

In this migration process, it is important to consider having a meticulously planned migration strategy. In this way, it guarantees a seamless and effective migration from outdated systems to modern ones. Detailed planning of migration operations, determination of migration goals and objectives, risk assessment, stakeholder participation, and a complete assessment and analysis of

the current system are all components of a well-planned migration strategy [9]. Organizations may minimize operational disturbances, manage possible risks, and guarantee the smooth integration of new technologies into the current IT infrastructure by creating a comprehensive migration strategy. An organized method for planning migrations also makes it easier to manage schedules, allocate resources efficiently, and assess the process after migration to make sure everything goes as planned.

2.2 Review of Related Systems

Within this chapter, the researchers will explore different pre-existing HRIS systems, their features, similarities, and relevance to addressing the identified problem. By examining pre-existing HRIS systems, researchers can identify unique advantages that can be leveraged to develop a more effective HR system solution. Furthermore, the chapter will explore the importance of Human Resource Information Systems (HRIS) in enhancing HR planning, job roles, performance reviews, and training initiatives that cover the multifaceted roles of HRIS in optimizing various HR procedures and sub-processes within organizations.

2.2.1 Overview of Popular HRIS Solutions

Throughout the years of HR systems, many different HRIS solutions have emerged, each offering unique features and capabilities tailored to organizational needs. Some allow services for generic HR web systems that are offering cloud-based services providing enhanced flexibility and accessibility compared to traditional data storage methods.

Modern popular HRIS solutions offer a wide range of functionalities most often including the core common services such as:

1. **Human Resources Management:** This includes all employee/personnel-related management. Ranging from job management, performance evaluation, scheduling/time-related services e.g., attendance, leave, work schedule, etc.
2. **Cloud-based Flexibility:** This allows for data storage or management through the use of cloud-based services. This allows for more scalable, reliable, and accessible data access due to its remoteness capability.

3. **Time/Scheduling Services (e.g., Attendance, Leave, Calendar):** This process is used for employee attendance management and other scheduling processes e.g., work schedule management, faculty attendance, absent without official leave (AWOL), etc.
4. **Payroll System:** This includes to timely compensation for employees with sub-processes including modules like automated payroll processing, tax compliance, benefits, reporting, wage management, employee self-service, etc.

2.2.2 Comparison of Features and Functionalities

In order to strengthen the proposed web application, a comparative analysis of different HRIS solutions needs to be gathered. This involves focusing on their strengths, weaknesses, and suitability for the University's requirements and use cases through different kinds of modules. For this, a comparison matrix of features and functionalities is established to visualize and clearly overview each system's strengths and the edge of the new proposed HR system over other pre-existing popular global systems.

	Modules	ADNU HRIS	OMNI HR	DEEL HR	PAYCOR HCM
GENERIC	Contacts	✓	✓	✓	✓
	Data Extraction	✓	✓	✓	✓
	Personal Info	✓	✓	✓	✓
	General Employee Status Tracker	✓	✓	✓	✓
	Employee Profile	✓	✓	✓	✓
	Assignment Designation	✓	✓	✓	✓
	Assignment Archive	✓	✓	✓	✓
	Faculty Rank	✓	✗	✗	✗
	Academic Record	✓	✓	✓	✓
	Academic Awards	✓	✓	✓	✓
	Professional License Record	✓	✓	✓	✓
	Training Attended Module	✓	✓	✓	✓
	Performance Evaluation	✓	✓	✓	✓
	COE	✓	✗	✗	✗
	COE Reports	✓	✗	✗	✗
	Contracts/Appointment Generation Reports	✓	✓	✓	✓
	Health Record	✓	✓	✓	✓
	Cloud-based	✗	✓	✓	✓
	Learning Management	✗	✗	✗	✓
	DTR Scanner	✓	✗	✗	✗
TIMESYS	Attendance Module	✓	✓	✓	✓
	Attendance Archive	✓	✗	✗	✗
	Flexible Time Office	✓	✓	✓	✓
	Staff Attendance Report	✓	✓	✓	✓
	Calendar Management	✓	✗	✗	✓
	Holiday Calendar Creation	✓	✗	✗	✗
	Work Schedule Scheme	✓	✓	✓	✓
	Assign Work Schedule Scheme	✓	✓	✓	✓
	Work Schedule Scheme Checker	✓	✓	✓	✓
	Tardines Module	✓	✓	✓	✓
	Remarks Module	✓	✓	✓	✓
	AWOL Module	✓	✓	✓	✓
	Overtime Module	✓	✓	✓	✓
	Staff Monthly/Annual Attendance Report	✓	✗	✗	✗
	Leave Application	✓	✓	✓	✓
LEAVESYS	Leave Reason	✓	✓	✓	✓
	Leave Credits	✓	✓	✓	✓
	Leave Credits Scheme	✓	✓	✓	✓
	Assign Leave Credit Scheme	✓	✓	✓	✓
	Process Leave Application with Leave Credits Report	✓	✓	✓	✓
	Faculty Attendance	✓	✗	✗	✗
FACSYS	Faculty Schedule	✓	✗	✗	✗
	Pending Faculty Schedule	✓	✗	✗	✗
	Required Class Hours	✓	✗	✗	✗
	Process Faculty Attendance Report	✓	✗	✗	✗

Table 2.1: ADNU HRIS in comparison with other HRM/HCM systems.

2.2.3 Evaluation of HRIS Solutions for Redesign

When organizations decide to redesign or migrate to a new HRIS system, it is crucial to critically evaluate the strengths and weaknesses of their current solution. This evaluation and analysis will help identify the areas that require improvement and set criteria for selecting the appropriate redesign approach. This section shall examine the evaluation process, highlighting the strengths and weaknesses of the current HRIS solution at the organization, and outlining the key criteria to consider when selecting a redesign strategy.

Strengths and Weaknesses of the current HRIS Solution

According to the study, the current system struggles with maintaining a scalable system preventing other processes from progressing e.g., the payroll system. Not only that, the system lacks better efficiency in operations i.e., being able to instantly receive up-to-date information from other branches. Due to the system's age in the technology stack, the ability for further updates and technological advancement to the application is hindered and is stuck to not break the operation e.g., the DTR scanner in HR uses an old version and limited compatibility with other software only accessible to Internet Explorer (IE).

Despite its issues, the system still performs as functional and operational as the current application for handling the HRIS and has well-established processes that define most of the core modules of the University's requirements.

Criteria for Selecting an HRIS Redesign

To solve the HRIS's issues, criteria for redesigning the HRIS have to be set, and must consider various factors before creating an application redesign. These factors must be included:

Scalability: By allowing the system to be as scalable as possible, organizations can effectively manage growth and adapt to changing business needs. This involves creating a database design that can adapt to various use cases and is generic.

Ease-of-Use: This involves developing and improving user experience (UX) by creating a responsive and modernized user interface (UI) for employees and admins to use. Doing this will improve not only the ease of access but will ensure better communication and exchange

of information from other departments.

Modernized Frameworks and Technology Stack: This involves replacing the existing technology stack with modern frameworks and tools to develop an up-to-date HRIS system. With this, the developers can use vast web technologies for better compatibility, and various design possibilities to create a better system accessible not only within University grounds but through internal networks.

Integration with UIIS: This involves centralizing the database through integration with the UIIS. This allows for improved efficiency due to its integration not only to the UIIS but to the MIS; aligning with the goals of the MIS office which is to create unified and interconnected systems within the University to streamline operations and workflows. This way data redundancy and inconsistencies eliminated.

2.2.4 Case Study Analysis of HRIS Redesign and Migration

To further prove the study, deeper analysis and examination of other works in HRIS redesign has to be considered in support of claiming the need for an HRIS redesign in the first place; why and how implementing HRIS equates to effectiveness in an organization's operations.

Case Studies of Successful HRIS Migration

Among millions of organizations across the world, research would show that at least 55% of organizations are only using Applicant Tracking System (ATS) or HRIS, and 45% of organizations currently do not use ATS or HRIS [50]. This meant that at least a large number of organizations have personal information management as decentralized; leading to issues like data inconsistency, redundancy, and inaccuracy.

In a recent study PT Pertamina based in India, conducted research regarding the effectiveness of their system — Information About Me Human Resource Information System (I-AM HRIS). According to the article, PT Pertamina developed the I-AM HRIS application in 2016 to facilitate HR administration processes and bring "One Pertamina" uniformity. The study used the DeLone and McLean IS Success model along with Quality Function Deployment (QFD) analysis to evaluate I-AM HRIS implementation effectiveness. However, the system became ineffective, with a survey

found that 67.8% of employees were unaware of the service facilities provided by I-AM HRIS, 52.4% did not frequently use the application, and employee satisfaction was not achieved [29].

With this analysis, the study recommended redesigning I-AM HRIS to improve quality and achieve better employee service satisfaction, especially focusing on increasing process speed and ease of use.

Challenges and Solutions

The problem with redesigning and migrating to a new system despite being just the same existing system but redesigned, is that it raises potential obstacles and challenges for developers to make. One of the common issues that organizations will likely resist in this proposal is the idea of change from employees to use the newer processes. More often than not, some organizations and people are used to legacy processes and will resist any changes. With this, comes considerations for the company to conduct training and knowledge transfer gaps. In addition, budgetary and resource constraints for the redesign and migration project may become a problem for some organizations.

Another critical issue is the data migration and integration across multiple systems, migrating to a newer system meant a probable change in the database schema. This major change will likely break the records and hinder the migration process. Hence, the emphasis on creating scalable and dynamic schemas is to be practiced as they serve as the foundation at the start of the design.

Despite these challenges, potential solutions for handling them can be through effective change management and communication strategies as well as conducting a comprehensive training program tailored to different user types. The team can also establish a project management strategy through iterative prototyping and user feedback loops to achieve user requirements. Moreover, create robust data migration planning and quality assurance before implementation.

Outcomes and Benefits Achieved Post-Migration

While the paper did not actually achieve post-migration and focused more on the evaluation of the existing state of the I-AM HRIS implementation using gap analysis and QFD, they still provided recommendations for redesigning I-AM HRIS to improve quality and achieve better employee service satisfaction, especially focusing on increasing process speed and ease-of-use. With this, we can infer potential outcomes and benefits earned if the migration were successful.

One would be the improved operational efficiencies in HR processes like employee data management, payroll, recruitment, etc. through automation and integration. Better scalable systems come with better data quality, consistency, and accuracy by redesigning the system to meet employee expectations allowing an increase in employee satisfaction and productivity by addressing gaps like slow processes mentioned in the case study and the lack of user-friendliness identified within the analysis.

Another benefit can be cost savings by reducing manual efforts and errors through the redesigned HRIS capabilities and overall better decision-making through access to comprehensive, real-time workforce analytics and reporting from the HRIS.

With this case study, the researchers can draw out similarities within the ADNU HRIS' current system being in the similar state with it being limited, lacking in accessibility, user-friendliness, and compatibility; that are in need of a new redesign and migration. Doing so will achieve the proposed objectives of this study and enhance the HR operations within the University.

Chapter 3

Technical Framework

One of the critical components in understanding and developing any system is establishing a firm theoretical framework. This chapter will delve into the foundational concepts and technologies that form the infrastructure of the HRMO system. By outlining the project code infrastructure, front-end and back-end technologies, and the database environment, the researchers aim to provide a comprehensive overview of the system's architecture and the rationale behind the technological choices.

3.1 Project Code Infrastructure

The web application utilizes Laravel by Taylor Otwell as the main full-stack web application framework. Laravel, by default, follows a Model-View-Controller (MVC) architectural pattern [15]. A common project structure when creating complex and dynamic web systems.



Figure 3.1: How the MVC Architecture Works.

With this architecture, the process is streamlined and optimized by following the Single-Responsibility Principle (SRP) rule in programming. Wherein, the *View* contains the web front-end web design/-experience and logic for sending client requests to the server. For every request the client makes, is handled within the *Controller*. Within this layer, it handles the logic for communicating within client-to-server requests and responses. Within this layer, will handle exceptions, validations, Data Access Objects (DAO), APIs, and many more [32].

For every *Controller* request to the Database, the *Model* layer is responsible for interacting with the database. The *Model* encapsulates the data and logic necessary for business operations, ensuring a clean separation of concerns. This architecture allows each component to focus on its specific responsibility, leading to a more maintainable and scalable system [32] [57].

3.2 Development Tools and Technologies

To effectively build and maintain the project, different development tools and technologies are to be utilized. Among the key tools and technologies employed in the project's development lifecycle are the following:

Figma: The developers utilized Figma as their main design tool to create high-fidelity wireframes, prototypes, and UI/UX designs. Figma offers a collaborative platform that enables seamless teamwork, version control, and real-time feedback among designers and stakeholders.

Version Control Tools (Gitlab/Git): The developers utilized version control tools such as Gitlab and Git to maintain version history and facilitate collaboration among team members. Git provides a distributed version control system that enables developers to track changes, manage code branches, and coordinate work effectively. Gitlab, as a web-based Git repository manager, offers additional features such as issue tracking, continuous integration (CI), and code review, enhancing the overall development workflow.

SQL Developer: On the back-end side, SQL Developer is utilized within the application for developers to manage the database schema, execute queries, write procedures, and business logic to the application. This data accessibility is possible through the use of a Virtual Private Network (VPN) application approved by the University's Database Administrator (DBA) and

Management Information Systems (MIS). With this, developers can establish a secure connection to the network, ensuring the confidentiality and integrity of data transmission between the application and the University's internal database.

3.2.1 Front-end Technologies and Languages

The system shall utilize different front-end technologies and languages to create a dynamic and responsive user interface. This will allow for a more streamlined development building complex features and modules. These technologies and languages will include:

NodeJS: The application utilized NodeJS as its main runtime for running the front-end libraries. This decision allowed the developers to utilize and integrate the vast JavaScript ecosystem in the application e.g., JQuery, Bootstrap, Xtreme, etc.

Vite: The application utilized Vite in partnership with NodeJS. This allowed the developers to efficiently increase productivity in development as Vite allows for fast Hot Module Reload (HRM). In addition, Vite is lightweight, fast, and efficient in alignment with the system's needs as it will be a high-traffic website.

Laravel Blade: The application will utilize Laravel's built-in templating engine. Laravel's Blade supports writing dynamic HyperText Markup Language (HTML) with added Hypertext Preprocessor (PHP) accessibility and the capability to use static web languages such as HTML, Cascading Style Sheets (CSS), and JavaScript.

Laravel Livewire: The application will utilize a front-end framework called Livewire. Livewire uses PHP as its main language and allows great compatibility with Laravel's default supported language. Livewire allows for building dynamic interfaces easily, without leaving the comfort of Laravel. By utilizing Livewire, the developers can write interactive components using simple PHP instead of relying heavily on JavaScript frameworks.

TailwindCSS: The application utilized TailwindCSS as its main CSS Framework. TailwindCSS allows for efficient and ready-made utility classes in order to eliminate the use of writing CSS in the application. TailwindCSS allows for efficient space in the application as it purges unused styling upon production.

3.2.2 Back-end Technologies and Languages

The system will utilize back-end technologies in compatibility with Laravel's back-end framework support. These technologies and languages will include:

Laravel Livewire: The application will utilize Livewire not only as a front-end framework but also as a tool to aid the controller in providing dynamic state changes in data requests. This allows for cleaner and shorter code for developers to write.

PHP: The application shall utilize PHP as the main server scripting language for writing business logic throughout the entire system. PHP allows for robust server-side scripting, supported integration with Oracle Databases, and a wide range of frameworks and libraries that enhance development speed and efficiency.

Composer: The application will utilize Composer as its dependency manager for PHP. Composer allows for managing and installing libraries and packages efficiently, ensuring that all dependencies are up-to-date and compatible. With this, the developers can integrate third-party packages and tools to streamline the project setup.

3.2.3 Database Environment and Language

Oracle Database: The application will utilize Oracle Database as its main Database Management System (DBMS). Oracle Database provides a robust, scalable, and secure environment for managing data [38]. By leveraging the Oracle Database, the application can handle large volumes of data efficiently and ensure high availability and reliability suitable for the project's complexity and objective capabilities.

PL/SQL: The use of Oracle as a DBMS comes with built-in supported database languages such as the Structured Query Language (SQL) and Procedural Language extension to SQL (PL/SQL). With PL/SQL, developers can write powerful stored procedures and packages directly within the database. This enables efficient data processing and manipulation, as well as the implementation of business logic directly at the database level allowing for a more secure business logic processing and scalability [37].

Chapter 4

Methodology

4.1 Development Model

In the development process of the system, the developers will utilize the Rapid Application Development (RAD) model as a project management strategy. This methodology is characterized by an iterative approach in the software development process, which begins with the specification of requirements from the users and proceeds through rapid prototyping iterative delivery, and continual maintenance for the currently completed software. This methodology is well-suited for the study as it provides researchers a clear overview to follow from the beginning to the end, making it easier to track each step's progress as well as make sure everything went according to the plan. Moreover, the RAD model is perfect to use for projects with expedited schedules and evolving requirements as it lays a strong emphasis on speed, adaptability, and user-centric design.

The implementation of RAD provides a substantial advantage in developing the HRIS application. In terms of speed in development, RAD makes it possible to develop and release new features, which makes it ideal for projects with tight deadlines. And because of its adaptability, it can accommodate changes in requirements even at the end of the development cycle, guaranteeing that the result fulfills the requirements of the users. With the user-centric nature of RAD, it includes user feedback in every iteration, which could increase user satisfaction with the finished product.

Furthermore, this methodology includes a risk reduction aspect which implies that early prototypes can help in recognizing any potential issues and reducing risks associated with functionality and usability. Due to RAD's iteration methodology, the HRIS system may be continuously improved in response to user feedback and changing educational requirements, keeping it updated and efficient in providing the desired outcomes.

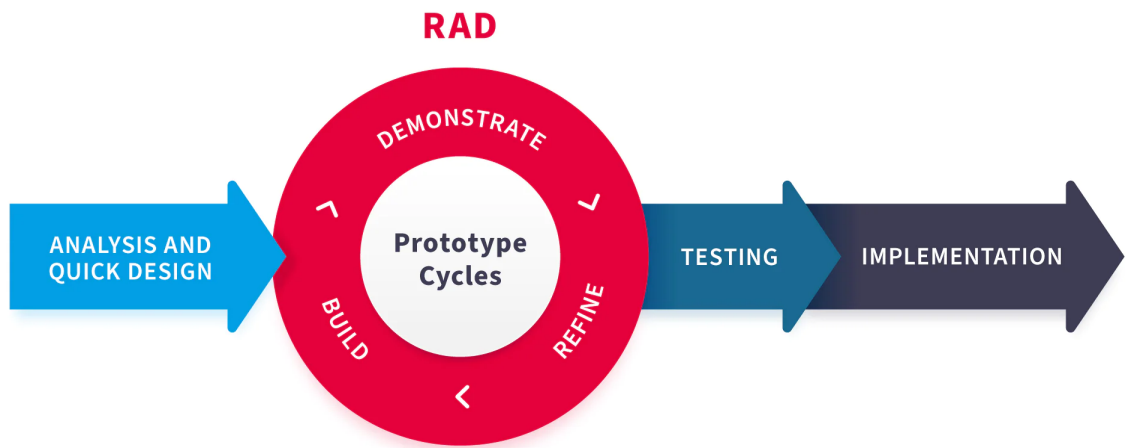


Figure 4.1: Rapid Application Development (RAD) Model.

4.2 System Analysis

The system analysis phase of the HRIS application development involves utilizing various methods to understand and define the system's functional and data requirements. These include information gathering, analytical methods, personnel consultation assessments, and content analysis. These methods aid in identifying user needs, defining system functionalities, and establishing the database schema. Through the use of visual tools like use Swim-lane Diagram, Use case Diagrams, Entity Relational Diagrams, and Gantt charts, the system analysis phase enables a comprehensive understanding of the HRIS application's scope and requirements. By employing a systematic approach to system analysis, the development team can ensure that the HRIS application is designed and implemented in alignment with the project objectives and user expectations.

4.2.1 Swim-lane Diagram

The Swim-lane diagram illustrates the process flow of the HRIS. The process begins when the user enters their login credentials. These credentials are unique to each University faculty employee, distinguishing them from other users in the system. Each user has different privileges and assignments set initially to access the system. After entering the credentials, the system validates them, granting the user access to the system. Once the user successfully logs in, they are directed to the dashboard where they can perform different actions depending on their privileges e.g., perform employee actions or tasks and HR overall general management.

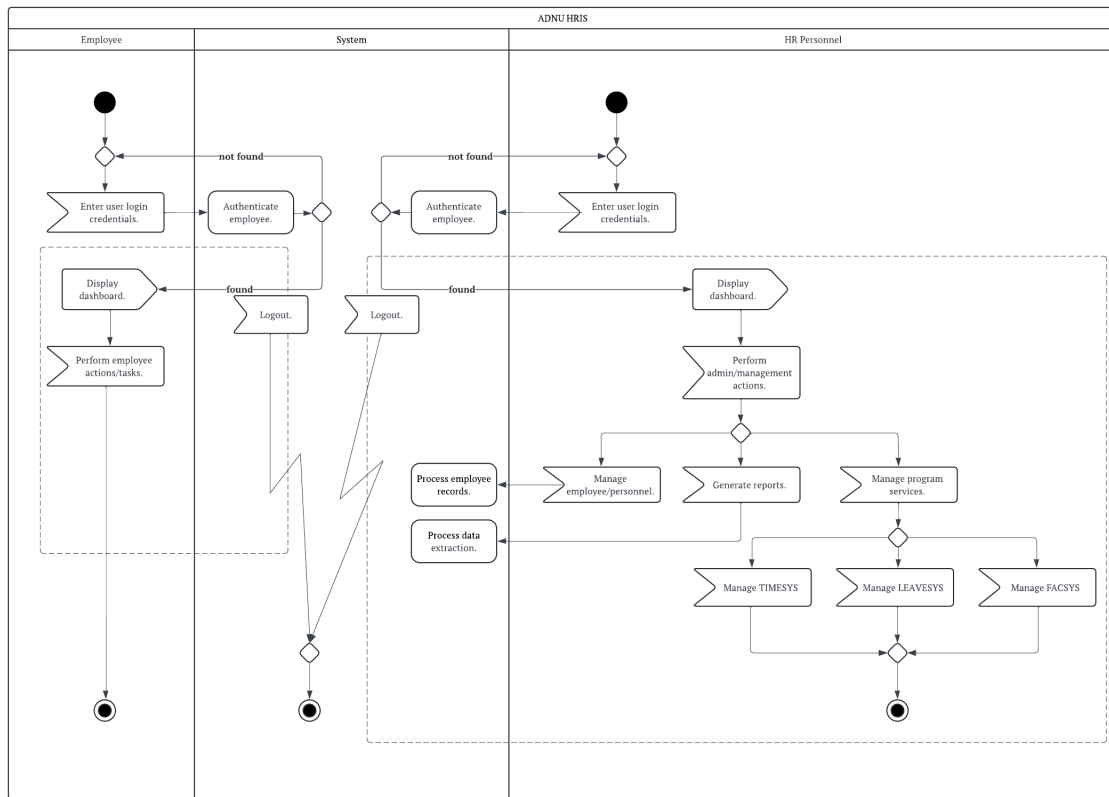


Figure 4.2: HRIS Swim-lane Diagram Model.

Each branch admin area can perform admin privileges and manage different modules within the system. For these actions, they are processed and managed under the system to provide a streamlined

operation for any users in the system. For every branch admins will have access to core modules e.g., Manage employee/personnel containing the employee contacts, personal information, profiles, assignments, assignment archive, faculty rank, academic, academic awards, professional license, training attendance, Certificate of Employment (COE), and health record.

Besides this, an admin can also generate different kinds of reports within the system e.g., performing data extraction, queries, employee performance evaluation, COE reports, contracts/appointment generation, etc.

4.2.2 Use Case Diagram

The use case diagram serves as a visual representation of the functional requirements of the system from an external user's perspective. It illustrates the interactions between users and the system, showcasing the various use cases and how they relate to each other. In the context of the HRIS application, the use case diagram will outline the different functionalities that users can perform within the system, such as employee management, payroll processing, and performance evaluation. By mapping out these interactions, the use case diagram helps in identifying the system's behavior and the roles of different users in the HRIS application.

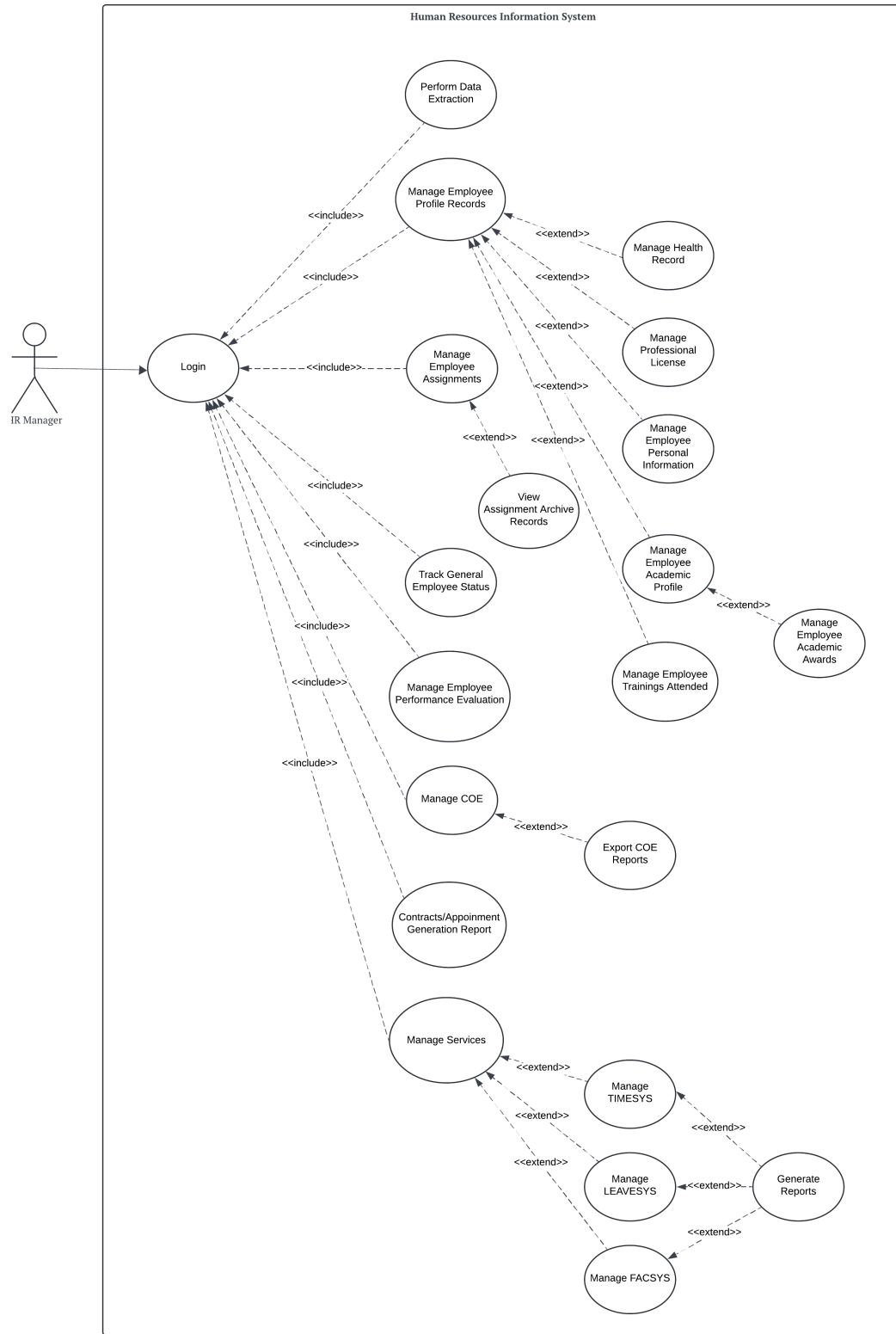


Figure 4.3: HRIS Use Case Diagram Model.

4.2.3 Entity Relational Diagram

The Entity Relational Diagram (ERD) will be used to visually represent the database structure that defines the relationships between different entities in the system and how they are related to one another through cardinalities and relationships. In the case of the HRIS application, MIS has provided ready access to the database scheme in preparation for the migration process. This ERD represents the various entities such as employees, departments, positions, and their relationships with each other.

Creating an ERD will allow the developers to design a database schema that accurately represents the data requirements of the HRIS system. This diagram is not only crucial for ensuring data integrity, normalization, and efficient data retrieval, but will also standardize and comply with the DBA requirements of the MIS for merge request and reviewing processes.

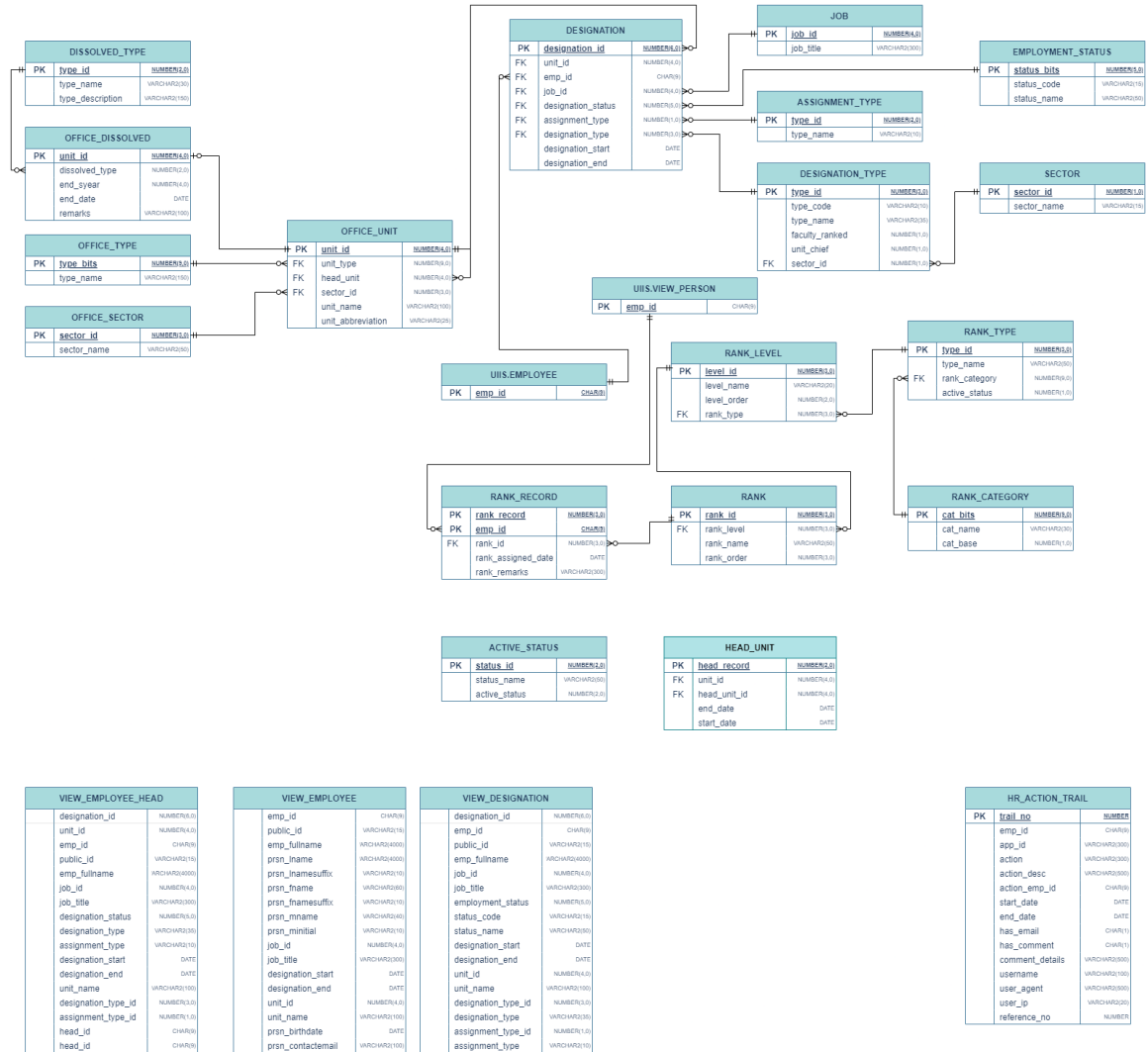


Figure 4.4: HRIS Core ERD Model.

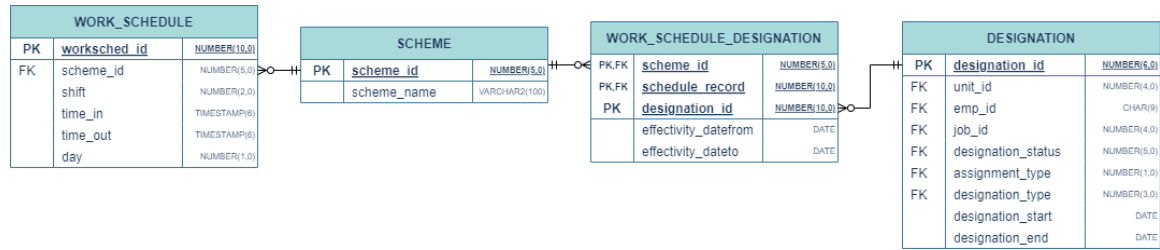


Figure 4.5: HRIS TIMESYS ERD Model.

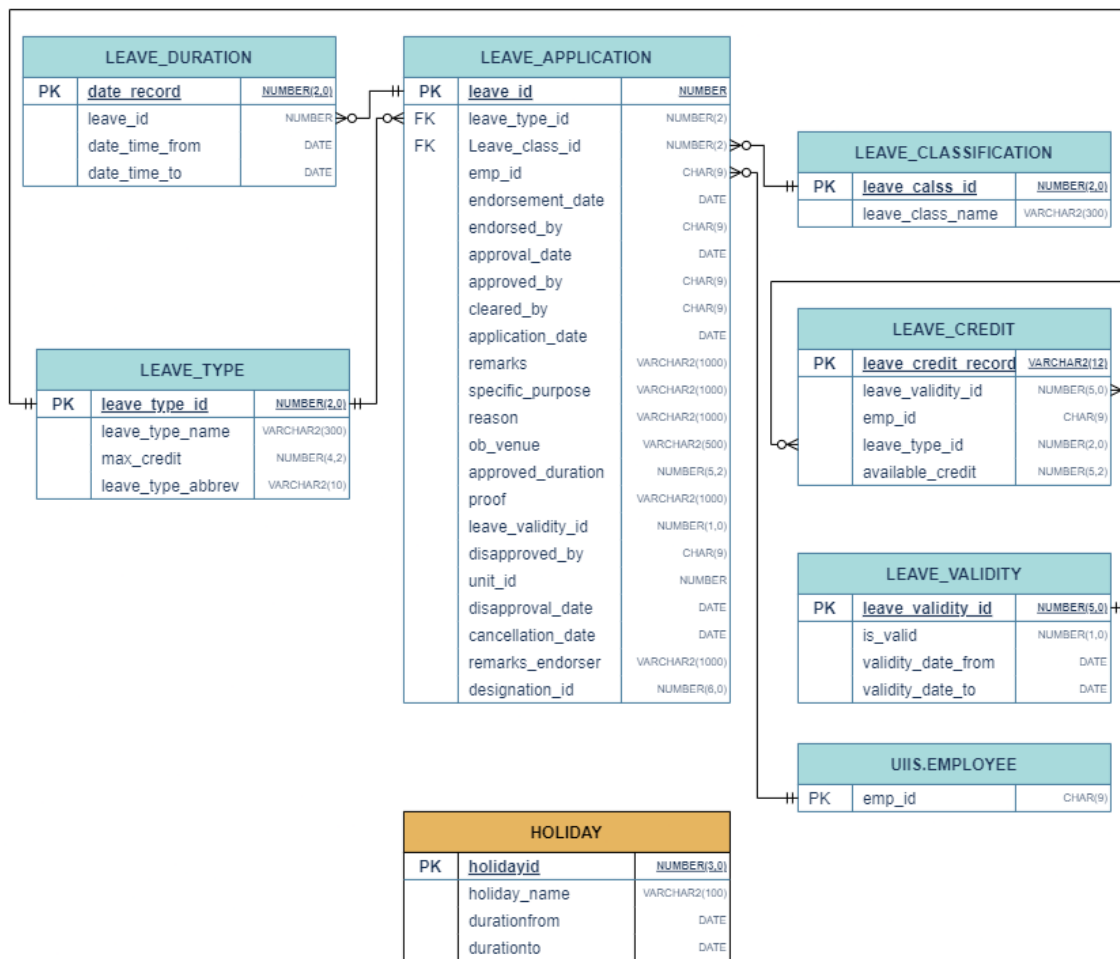


Figure 4.6: HRIS LEAVESYS ERD Model.

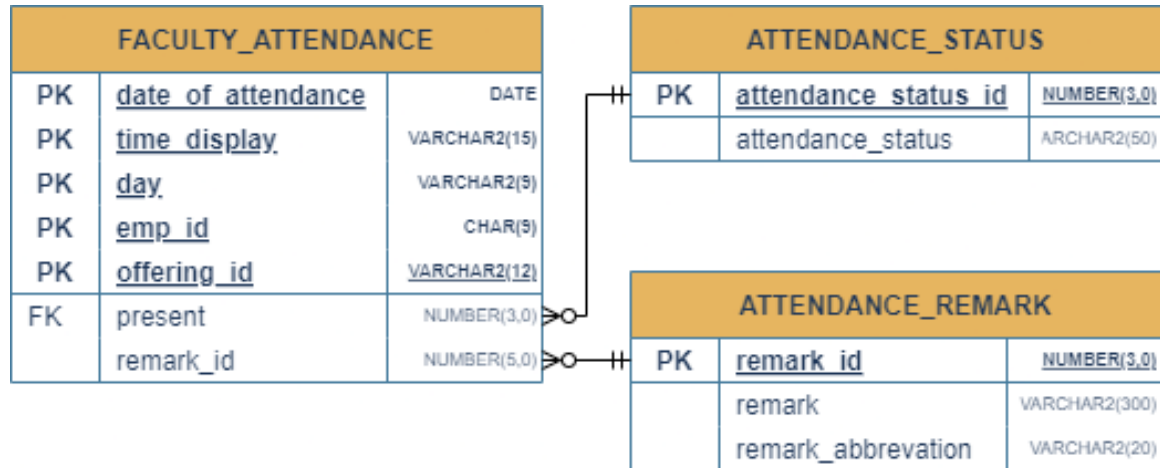


Figure 4.7: HRIS FACSYS ERD Model.

4.2.4 Gantt Chart

Gantt chart allows for a visual representation of the project schedule that outlines the tasks, milestones, and dependencies throughout the development time. In connection with the development of project management strategy through RAD, the HRIS application's use of a Gantt chart will help in planning and tracking the project's progress. It will break down the development process into specific tasks, assign responsibilities, and establish timelines for each phase of the project.

With this, the development team can effectively manage resources, monitor progress, and ensure that the project stays on track to meet the specified deadlines.

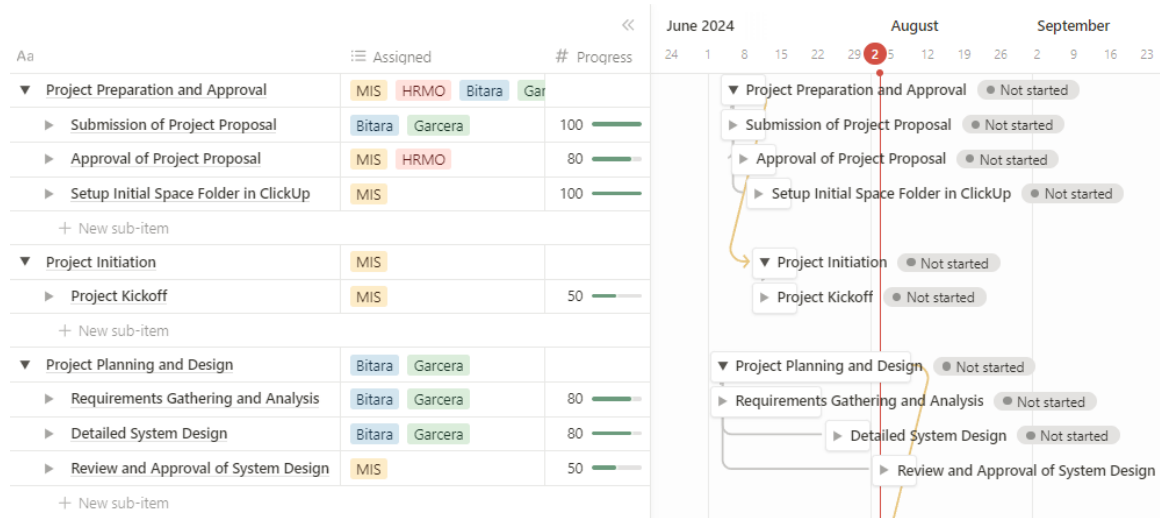


Figure 4.8: HRIS Gantt Chart Pre-planning Timeline.

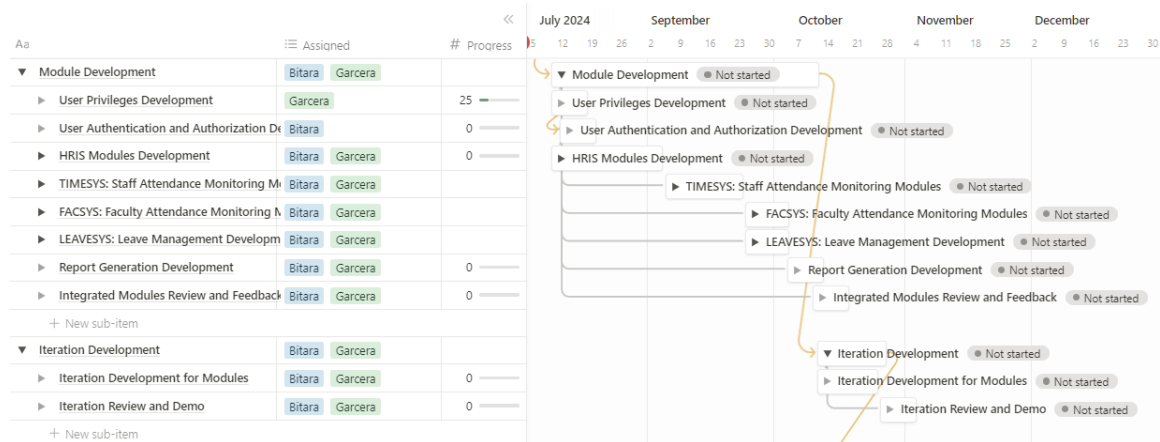


Figure 4.9: HRIS Gantt Chart Modules Development Timeline.

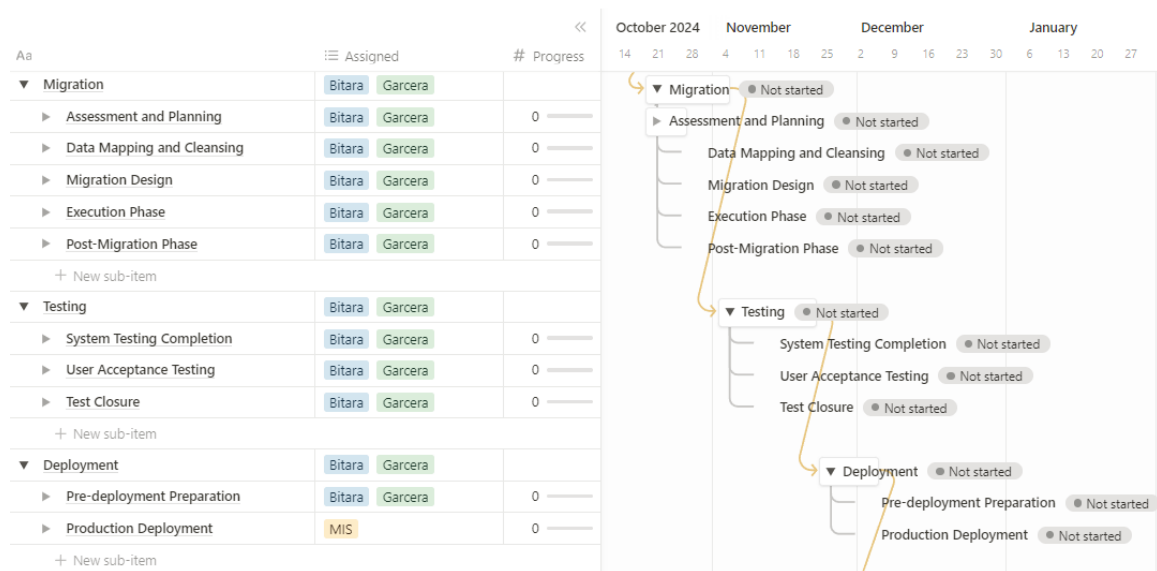


Figure 4.10: HRIS Gantt Migration to Deployment Timeline.

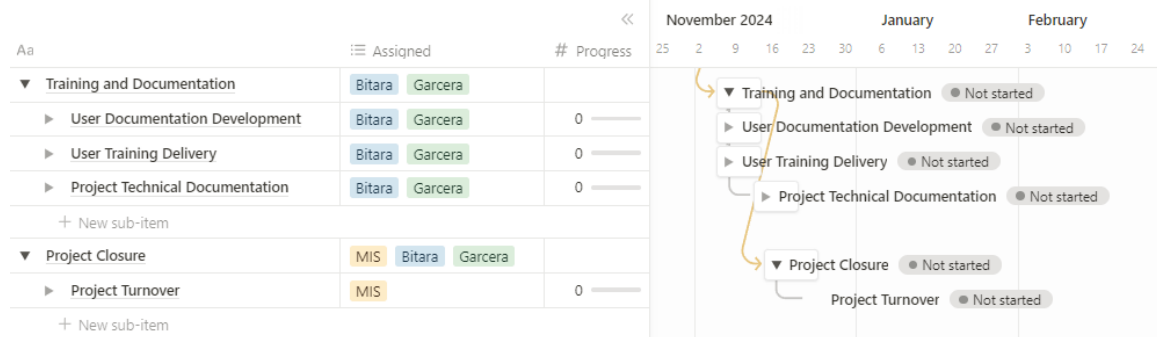


Figure 4.11: HRIS Gantt Post Development Timeline.

4.3 Data Migration Plan

4.3.1 Objectives

The data migration plan aims to ensure a smooth and efficient transition of data from the existing HRIS system to the new HRIS application. The key objectives of the data migration plan include:

1. Identify and extract relevant data from the existing HRIS system.
2. Transform and map the data to align with the new HRIS database schema.
3. Load the data into the new HRIS application while ensuring data integrity and accuracy.
4. Validate the migrated data to ensure completeness and consistency.
5. Minimize downtime and disruptions to the HR operation.
6. Document the data migration process and outcomes for future reference.

4.3.2 Data Migration Strategy

The data migration strategy will involve the following key steps:

Assessment and Planning

This phase involves identifying the key stakeholders, analyzing the current HRIS that being utilized, gathering requirement for the new system. Having a proper assessment and planning are crucial in understanding the scope of the migration, identifying potential risks, and setting clear objectives. This phase ensures that all stakeholders are aligned and that the migration plan addresses all necessary aspects of the project. Also, effective planning will help mitigate risks and lays a solid foundation for the migration process.

Data Mapping and Cleansing

In this phase, it includes aligning the data fields from the legacy system to the new HRIS and correcting data quality issues. To ensure that all important data is correctly transferred to the new system, having an proper or accurate data mapping is needed. This phase also includes data cleansing as it is essential for maintaining data integrity and ensuring that the new system operates with accurate and reliable data. This step is critical for preventing data-related issues post-migration and ensuring a smooth transition.

Migration Design

The Migration design involves selecting migration tools and deciding on the migration approach. Choosing the necessary and right tools and approach can significantly reduce the risk of errors and downtime. With a well-designed migration process ensures that data is transferred efficiently and securely. This step is important for optimizing the migration process and ensuring that it aligns with the project's goals and constraints

4.3.3 Execution Phase

Pilot Migration

Conducting a pilot migration involves setting up a test environment and performing a trial run with a subset of data. A pilot migration helps identify potential issues and validate the migration process before the full migration. Also, with this step it helpful for minimizing risks and ensuring a smooth transition. It allows for adjustments to be made based on the findings from the pilot, thereby improving the overall migration strategy

Full Migration

In this full migration, it involves extracting, transforming, and loading the full dataset into the new system. Proper execution ensures that all data is accurately transferred and that the new system is ready for use. Validation and reconciliation are essential to confirm data integrity and completeness. This step is the core of the project and requires meticulous planning and execution to ensure success

4.3.4 Post-Migration Phase

Post-migration activities include system testing, data validation, user training, and providing support. These activities ensure that the new system operates correctly, that data integrity is maintained, and that users are comfortable with the new system. Ongoing support helps address any issues that arise after the migration. This step is crucial for ensuring the long-term success of the new system and for achieving user satisfaction

4.4 System Testing Plan

The system testing phase aims to comprehensively evaluate the functionality, performance, and reliability of the application. To ensure a thorough assessment, we have established the following key objectives within the system testing plan:

1. Verify the functionality of all system features and modules.
2. Ensure the system meets all specified requirements.
3. Identify and document any bugs or issues.
4. Validate the system's performance and response times.
5. Test the user interface for usability and intuitiveness.
6. Confirm data integrity and security measures.
7. Assess the system's compatibility with different browsers and devices.

4.4.1 Participants

Throughout the testing phase, the participants will include the HR managers as well as the Information System Administrator, and the DBA Administrators.

4.4.2 Equipment and Hardware Requirements

The requirements for using the application is minimal due to its chosen deployed platform – web. The application will only require any modern device that can access the internet through modern up-to-date browsers; specifically Google Chrome version 96 and above.

The testing phase will be conducted within University grounds as it will require the University's internal network for it to be accessed.

4.5 System Deployment Plan

This section contains some of the high-level tasks and considerations that will be addressed during the deployment phase of the newly developed and migrated ADNU HRIS.

4.5.1 Deployment Planning

The deployment plan identifies the requirements and responsibilities of both the client and the development team in preparation for deployment. This includes accomplishing HR requirements – HR core modules, TIMESYS, LEAVESYS, and FACSYS after reaching satisfaction within the testing plan.

4.5.2 Resources

Facilities

The facilities required for testing and deployment to the new HRIS will be conducted within the HR office grounds equipped with modern computers as well a reliable and high-speed internet connection.

Hardware

The hardware required for running the application shall include:

1. Desktop Computers/Laptops
 - (1) **Processor:** Minimum Intel Core i3 or AMD equivalent
 - (2) **RAM:** Minimum of 4GB (recommended 8GB or higher)
 - (3) **Storage:** Minimum of 128GB (recommended 256GB or higher)
2. Backup and Recovery Hardware
 - (1) **Backup Power supply:** This is to avoid downtime during any power outages to ensure uninterrupted workflow. Ensure that there is a Uninterruptible Power Supply (UPS) systems for critical hardware.

- (2) **Electric Generators:** This is to for any extend outages that can occur within operations time. This ensures that the University can still cater and be operational despite the outages.

3. Peripheral Devices

- (1) **DTR Scanner:** The HR module TIMESYS will utilize the DTR Scanner for employee attendance purposes.
- (2) **RFID Scanner:** The RFID scanner will be utilized in support for the DTR within HR.

Support Software

As the project will utilize Oracle for the data migration, the supported software shall be to use Oracle 12c with instantclient12 installed and sqldeveloper for the database management solution.

Being a web-based application, the project requires to run on modern browsers with version 96 and above for Google Chrome. This ensures better up-to-date features and better security patches for each devices.

Support Documentation

The documentation required to support the application shall include:

User Manuals: Detailed guides for end-users to navigate and utilize the HRIS effectively.

Technical Documentation: In-depth documentation for developers detailing the system architecture, database schema, and configuration settings.

Training Materials: Resources for training sessions, including slides, and user manuals.

FAQs and Troubleshooting Guides: Common issues and their resolutions to assist users and support staff under user manual.

System Requirements: Specifications for hardware, software, and network configurations needed to run the new HRIS.

4.5.3 Deployment Strategies

The project will be deployed through a series of code review, database review, iteration, and installation of the developed app to the server after a series of testing and acceptance to the application. This process involves multiple personnel including the DB Administrator, Senior Application Developer, and Information System Administrator.

4.5.4 Contingencies

Contingency plans are ensured to mitigate any potential issues that may arise during and after deployment, the following contingency plans will be put in place:

Rollback Plan: A rollback strategy will be developed and practiced for each implementation to revert to the previous system in case of any critical failures during deployment. This includes utilizing version controls and maintaining a full backup of the old system.

Performance Monitoring: Includes continuous monitor of system performance post-deployment through feedback and user reports from the HR for any performance degrade.

4.5.5 Compatibility Strategies

To ensure smooth deployment and integration of the new ADNU HRIS, the following compatibility strategies will be implemented:

System Compatibility Testing: Rigorous testing will be conducted to ensure the new HRIS is compatible with existing hardware, software, and network infrastructure at ADNU.

Browser Compatibility: The web-based application will be tested across multiple browsers and versions to ensure consistent functionality and appearance.

Integration Testing: Comprehensive testing will be performed to verify seamless integration with other existing systems and databases at ADNU.

Legacy System Compatibility: Where necessary, interfaces or middleware will be developed to ensure compatibility with any legacy systems that need to interact with the new HRIS.

Scalability Testing: The system will be tested to ensure it can handle increased load and user numbers as the university grows. This includes data optimization during any reports or querying.

4.6 System Snapshots

In this section, contains some of the few initial screen mock-ups for redesigning among the major services of the previous HR system. This includes samples high-fidelity wire frame made in Figma. This allows for better visualization to the expected output for the new ADNU HRIS.

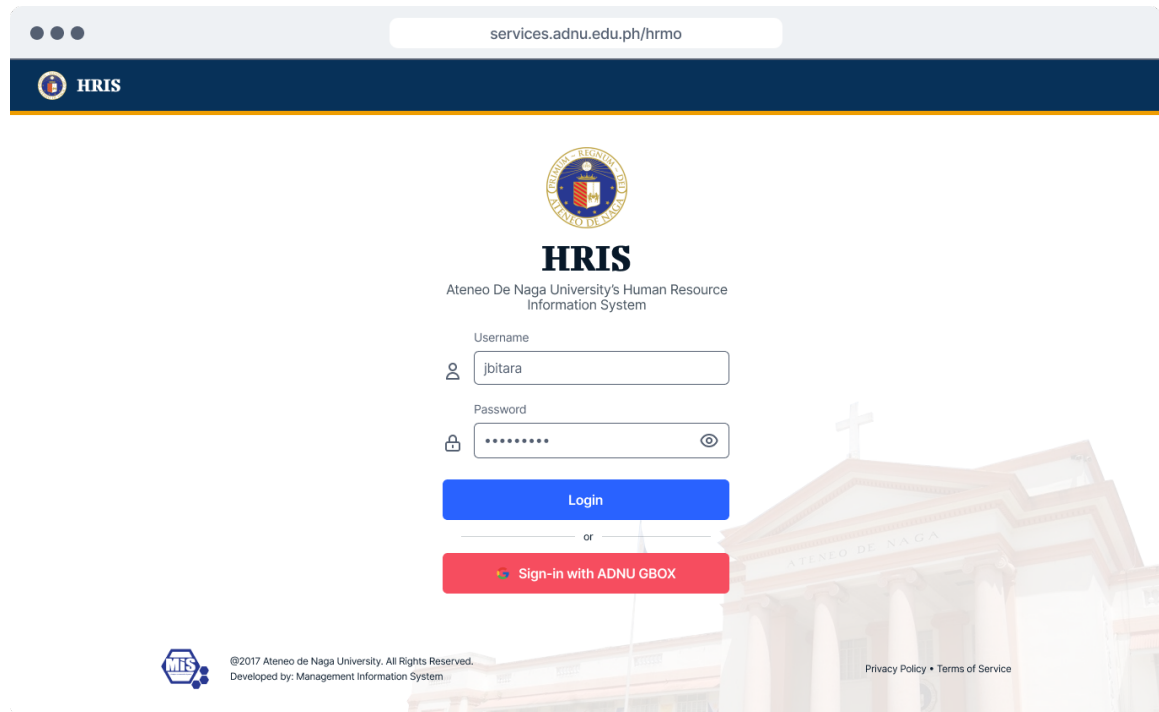


Figure 4.12: New HRIS Login Page.

The new design displays the redesigned login page. It features a clean, modern interface with input fields for username and password, as well as a prominent login button. The design emphasizes user-friendliness and security for accessing the HRIS platform.

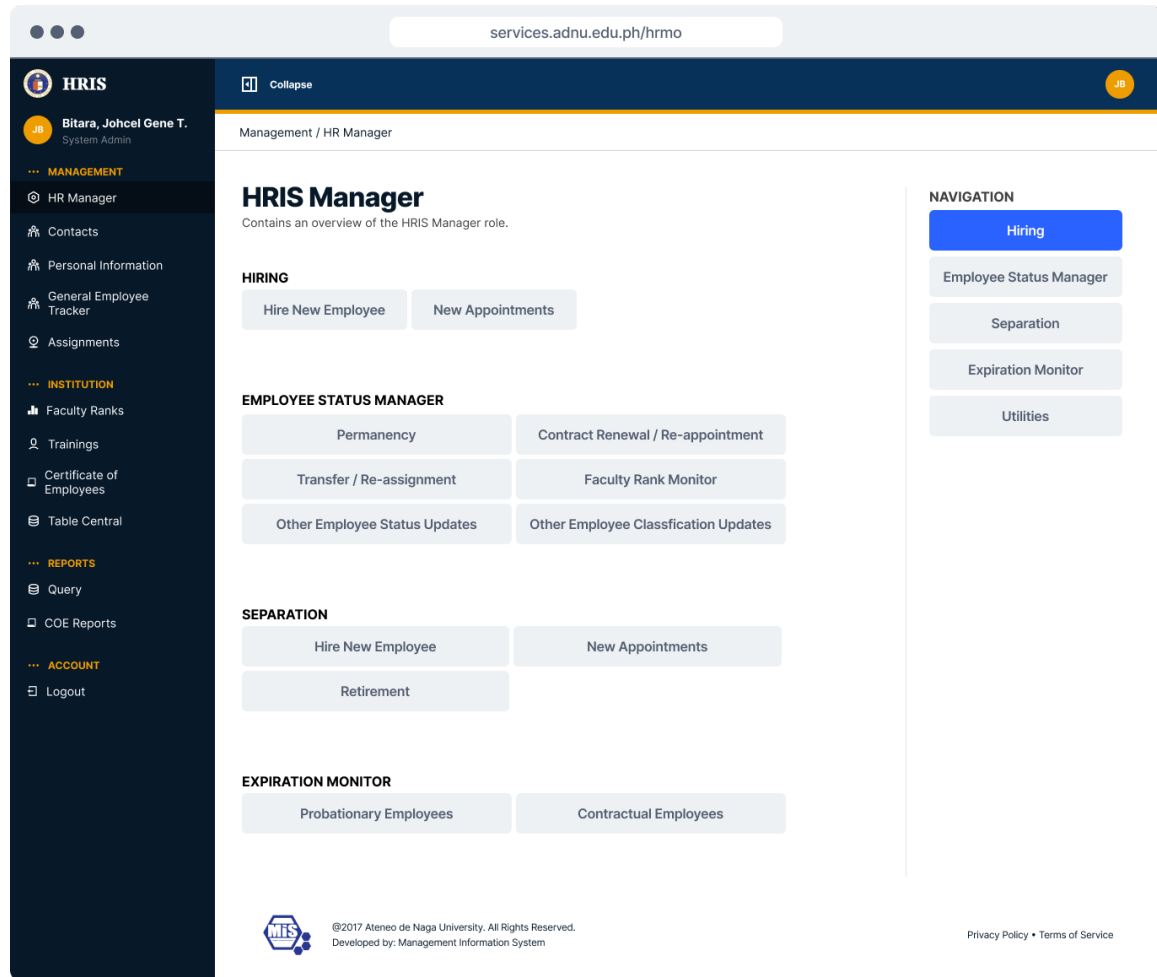


Figure 4.13: New HRIS Manager Page.

The figure presents the newly designed HRIS Manager page. This includes mainly making use of better user experience with enlarged buttons and easier navigation with the use of better UI layout.

The screenshot displays the HRIS Data Extraction page. The sidebar on the left contains navigation links for MANAGEMENT (HR Manager, Contacts, Personal Information, General Employee Tracker, Assignments), INSTITUTION (Faculty Ranks, Trainings, Certificate of Employees, Table Central), REPORTS (Query, COE Reports), and ACCOUNT (Logout). The top header shows the URL 'services.adnu.edu.ph/hrmo' and a 'Collapse' button. The main content area is titled 'Data Extraction' and includes a 'Reset' button and an 'Export to Excel' button. Below the title, there is a 'Filter Fields' dropdown menu. The 'Fields' section contains a vertical timeline of filters: Assignment Type (Select), Institution (Select), Birthdate Range (From 0 To 0), and Age Between (From 0 To 0). To the right of the timeline, there are toggle switches for various fields: Colleges, Designation Sector, General Employment Status, Academic Level, Office, Employment Status, Office Sector, Professional License, and Academic Rank. The 'Result' section shows a table with columns: #, Effectivity Date, Reinstatement, Action, Reason, Date Edited, Last Edited, and Action. The table currently displays 'No data available'. At the bottom, there is a pagination bar with 'Previous', '1', '2', '3', '4', '5', '6', and 'Next' buttons. The footer includes the HRIS logo, copyright information for Ateneo de Naga University, and links for Privacy Policy and Terms of Service.

Figure 4.14: New HRIS Data Extraction Page.

This figure showcases the new Data Extraction Page. The interface is designed to facilitate efficient retrieval of HR data, likely offering options for customizable reports, data filtering, and export

functionalities.

The screenshot displays the HRIS (Human Resource Information System) interface for the General Employment Status Tracker. The page is titled "General Employment Status Tracker" and includes a search bar for employee names. Below the search bar, there is a table showing employee statuses. The table has columns for #, Effectivity Date, Reinstatement, Action, Reason, Last Edited By, and Date Edited. The table contains four rows of data. Below the table, there is a section for "Employment Status Information" with input fields for Effectivity Date, Reinstatement Date, and Action, and a text area for Default.

#	Effectivity Date	Reinstatement	Action	Reason	Last Edited By	Date Edited
1	June 01, 1978	June 05, 1978	New Employee	I experienc..	LEJANO, Jerico Se...	9:15PM 09/05/2019
2	June 12, 2011	June 20, 2011	Absence Without Of	I experienc..	LEJANO, Jerico Se...	9:15PM 09/05/2019
3	October 31, 2011	--	Contract Expiration	Due to the ..	LEJANO, Jerico Se...	9:15PM 09/05/2019
4	October 31, 2011	--	Contract Expiration	--	LEJANO, Jerico Se...	9:15PM 09/05/2019

Employment Status Information

Effectivity Date: June 12, 2011

Reinstatement Date: June 20, 2011

Action: Absence Without Official Leave

Default: I experienced a sudden family emergency that required my immediate attention. My mother fell critically ill, and I had to rush her to the hospital, where she required constant care and support.

Figure 4.15: New General Employment Status Tracker Page.

This figure illustrates the new General Employment Status Tracker (GEST) page. The GEST interface likely provides a comprehensive view of employee statuses across the organization. It includes employment types, contract durations, leave statuses, and other key indicators of workforce composition.

The screenshot displays the HRIS (Human Resource Information System) interface. The top navigation bar includes the HRIS logo, the user profile of Bitara, Johcel Gene T. (System Admin), and a Collapse button. The left sidebar contains a menu with sections: MANAGEMENT (HR Manager, Contacts, Personal Information), INSTITUTION (Faculty Ranks, Trainings, Certificate of Employees, Table Central), REPORTS (Query, COE Reports), and ACCOUNT (Logout). The main content area is titled 'Personal Information' and includes a 'Create New' button. Below the title is a search bar and a 'Show 10 entries' dropdown. The table lists employee information with columns for #, Employee ID, First Name, Middle Name, Last Name, Age, and Religion. The table contains 10 rows of data. At the bottom, there is a pagination bar with 'Previous', '1', '2', '3', '4', '5', '6', and 'Next' buttons. The footer includes the MIS logo, copyright information for Ateneo de Naga University, and links for Privacy Policy and Terms of Service.

#	Employee ID	First Name	Middle Name	Last Name	Age	Religion
1	HR200312304				20	Roman Catholic
2	HR202013304				24	INC
3	HR202032301				26	Muslim
4	HR200355012				30	Roman Catholic
5	HR199340021				30	Romain Catholic
6	HR199084092				29	Hindu
7	HR202100044				28	Roman Catholic
8	HR202100377				22	Roman Catholic
9	HR202100012				24	Roman Catholic
10						

Figure 4.16: Personal Information for All Employees.

This figure displays all the basic personal information for all employees in table view. This includes their personal information. Admins can select among the employees to view more of their personal information.

The screenshot shows a web application interface for HRIS. The top navigation bar includes the URL 'services.adnu.edu.ph/hrmo'. The left sidebar contains a menu with sections: MANAGEMENT (HR Manager, Contacts, Personal Information, General Employee Tracker, Assignments), INSTITUTION (Faculty Ranks, Trainings, Certificate of Employees, Table Central), REPORTS (Query, COE Reports), and ACCOUNT (Logout). The main content area is titled 'Insert New Personal Information' with a subtitle 'This will create a new employee personal information.' and fields for 'Last Modified By' and 'Last Date Modified'. Below the title is a silhouette icon and a tabbed interface with 'Info', 'Health', 'Prof. License', 'Academic Profile', and 'Trainings Attended'. The 'Info' tab is active, showing a form with fields for First Name (John), Middle Name (L.), Last Name (Doe), Nickname (John), Age (46), Religion (Roman Catholic), Date of Birth (05/02/1995), Place of Birth (Marikina City), Citizenship (Filipino), Height (Inches) (71), Weight (lbs) (76), Gender (Male), and Blood Type (O). A progress bar at the bottom indicates the current step. On the right side of the form, there are buttons for 'Personal Info.', 'Contact Info.', and 'Employee Info.'. At the bottom right, there are 'Cancel' and 'Update' buttons.

Figure 4.17: Creating New Personal Information in the Record.

This figure displays the interface for creating new personal information in the record. Admins can input the necessary information for the employee to be added to the system.

The screenshot displays the HRIS Table Central page. The left sidebar contains the following navigation links:

- MANAGEMENT
 - HR Manager
 - Contacts
 - Personal Information
 - General Employee Tracker
 - Assignments
- INSTITUTION
 - Faculty Ranks
 - Trainings
 - Certificate of Employees
 - Table Central
- REPORTS
 - Query
 - COE Reports
- ACCOUNT
 - Logout

The main content area shows the HRIS Table Central page with the following table:

Offices	Abbreviation
Junior High School Admission and Aid Office	JHSO
Management Information System	MIS
AGrS Science and Technology and Livelihood Education Department	ASTL
College of Science, Engineering and Architecture - Dean's Office	CSE

The right sidebar contains the following navigation items:

- Academic Levels
- Civil Status
- Colleges
- Designation Sector
- Employee Classification
- Employment Status
- Faculty Ranks
- Office Sector
- Offices

The footer includes the following information:

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Developed by: Management Information System

Figure 4.18: New HRIS Table Central Page.

This figure displays the HRIS Table Central module wherein, managers can manage certain sectors and department information and make updates within the University.

The screenshot displays the 'Certificate of Employees' page in the HRIS system. The interface includes a sidebar with navigation links and a main content area with various input fields and buttons.

Navigation Sidebar:

- HRIS
- Bitara, Johcel Gene T. (System Admin)
- MANAGEMENT
 - HR Manager
 - Contacts
 - Personal Information
 - General Employee Tracker
 - Assignments
- INSTITUTION
 - Faculty Ranks
 - Trainings
- Certificate of Employees
- Table Central
- REPORTS
 - Query
 - COE Reports
- ACCOUNT
 - Logout

Main Content Area:

Institution / Certificate of Employees

Certificate of Employees

Manage and produce COE.

Title (Optional) **Employee** **COE Number** **S.Y.**

Atty.

Filter Fields

Gross Monthly **Month and Year**

Amount in Words

Five thousand two hundred fifty dollars and zero cents

Gross Annual **From** **To**

Amount in Words

Sixty-three thousand dollars and zero cents

Official Receipt No. **Date Requested**

Purpose

Visa application

Footer:

MIS ©2017 Ateneo de Naga University. All Rights Reserved. Developed by: Management Information System Privacy Policy • Terms of Service

Figure 4.19: New HRIS Certificate of Employment Processing Page.

This interface is designed to streamline the creation and issuance of employment certificates. Managers can select employees and generate COE for each University personnel.

Appendix A

HRIS Modules

During the consultation with the Management Information Systems Director, the researchers were able to gather information about the current HRIS modules. The following table shows the modules that are currently being used by the HRMO.

The four (4) major core covered in the current HRIS listed in table A.1 are the following:

1. **HRIS Modules:** This involves the basic modules that are currently being used by the University's HRMO.
2. **TIMESYS:** This module is responsible for the timekeeping and attendance monitoring of the University's employees.
3. **LEAVESYS:** This module is responsible for the leave management of the University's employees.
4. **FACSYS:** This module is responsible for the faculty management of the University's employees.

	Modules	Brief Description
HRIS MODULE	Contacts	Module use to save contact numbers within and outside the university
	Data Extraction	Module that handles query to retrieve processed information
	Personal Info	Module to store personal information of employees
	General Employee Status Tracker	Module use to track down status movements of the employees
	Employee Profile	Contains other information of the employees
	Assignments	This module contains the active designation of the employee
	Assignment Archive	Contains the archived/history designation of the employees
	Faculty Rank	Modules that handles academic rank of the faculty
	Academic Profile	Academic records of all employees
	Academic Awards	Module that handles the awards receive by the employee on a particular academic level
	Professional License Record	Professional license record of employees
	Training Attended Module	Contains record of training attended of employees
	Performance Evaluation	Contains the average performance evaluation of each employee.
	COE	Inputs the necessary data to produce the certificate of employment
	COE Reports	View of the newly requested COE
	Contracts/Appointment Generation Reports	Generates contracts/appointment of employees.
	Health Record	Contains health info of the employee

Table A.1: HRIS Basic Modules List

	Modules	Brief Description
TIMESYS	DTR Scanner	Captures the login and logout of all staff employees.
	Attendance Module (Non-Teaching Staff)	Attendance record of staff for the current and last month of the year.
	Attendance Archived	Full Attendance record of staff.
	Process Staff Attendance Report	Process the raw data of staff attendance record.
	Holiday Module	Stores the holidays of the year which is necessary for the monthly attendance report of staff
	Work Schedule Scheme	List of work schedule followed by the employees
	Assign Work Schedule Scheme	Assign the work schedule scheme to the employees. Scheme that is being followed by each staff
	Work schedule scheme checker	Check if there are existing work schedule that matches the desired work schedule.
	Tardiness Module	This module handles the tardiness incurred by the employees in a particular month.
	Remarks Module	Add remarks
	Awol Module	Process and add awol record in the database
	Overtime Module	Process and compute attendance record in the database
	Staff Monthly/Annual Attendance Report	

Table A.2: HRIS TIMESYS Modules List

	Modules	Brief Description
LEAVESYS	Leave Application (Faculty and Staff)	Stores all the approved leave application of all employees
	Leave Reason	List of all reasons used by the employees
	Leave Credits (Faculty and Staff)	Contains the incurred and remaining leave credits of all employees
	Leave Credits Scheme (Faculty and Staff)	Identify the details of the leave credits scheme.
	Assign Leave Credits Scheme	Identify the leave credits schemed assigned to each employee
	Process Leave Application with Leave Credits Report	Leave application and leave credits report that is useful for decision making for each employee.

Table A.3: HRIS LEAVESYS Modules List

	Modules	Brief Description
FACSYS	Faculty Attendance	Contains the attendance of all faculty filtered by semester and school year based on the schedule encoded in the Faculty Schedule Module
	Faculty Schedule	Contains the schedule of all faculty filtered by semester and school year based on the faculty loading report.
	Pending Faculty Schedule	Contains the incurred and remaining leave credits of all employees
	Required Class Hours	Identify the required class hours of each faculty for the particular semester and school year.
	Process Faculty Attendance Report	Process the attendance record of faculty on the desired date/month of the user.

Table A.4: HRIS FACSYS Modules List

Appendix B

Interview Transcript

To further understand the processes of the current HRIS along with specific details, the researchers sent a formal interview request letter on July 1, 2024. The document has undergone reviews, approval, and endorsement of the SP Adviser/Dean/CITO/CSIO, as well as the CCS Chairperson, and given that the project is an MIS initiative, the approval of the MIS Director is requested.

On July 5, 2024, the researchers conducted a formal interview along with the System Administrator Specialist, HRMO – Ms. Leanne Gemelly B. Briones. The interview lasted from 3:00PM to 4:00PM.

The interview covered various aspects of the current HRMO system and processes, starting from a general overview regarding HRIS to user experience, system limitations, data management, current requirements, and diagrams and documents. This allowed the researchers to better gain understanding of the processes and identify priorities within modules to create and disregard.

July 1, 2024

MS. MYLLAN B. TOLEDANA

Director, Human Resource Management Office

Through: **MS. LEANNE GEMELLY B. BRIONES**
System Administrator Specialist, HRMO

Dear Ms. Toledana,

Greetings!

We are 4th year students at Ateneo de Naga University taking Bachelor of Science in Information Technology. As part of our curriculum, we are conducting a capstone project research for the University's Human Resources Information System (HRIS). Given the approval of our topic defense, we are writing to request an opportunity to conduct a formal interview with the personnel involved in the management of the HRIS.

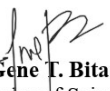
The interview aims to cover the following areas:

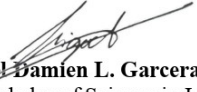
1. Thoroughly understand the current HRIS, including architecture, functionalities, and limitations.
2. Identify the main issues and challenges the HR department faces with the current system.
3. Expectations for the redesign and migration initiative for the HRIS.
4. Understand the data migration requirements and integration needs with other systems.

This capstone project has been recommended, endorsed, and will be monitored by the MIS Office.

We are available for the interview at your earliest convenience and hope to conduct the interview before July 5, 2024. We request that the interview be conducted in person for better communication and understanding.

Yours sincerely,


Johcel Gene T. Bitara
4 – Bachelor of Science in Information
Technology


Miguel Damién L. Garcera
4 – Bachelor of Science in Information
Technology

Endorsed by:


Joshua C. Martinez
SP Adviser/ Dean / CITO, CCS/ CSIO

For: 
Lowie Vincent S. Bisana
Chairperson, Department of Computer Science


Estrella H. Montealegre
Director, Management Information System

Figure B.1: Formal Interview Request.

AdNU HRMO Interview Transcript
July 5, 2024
3:00 PM - 4:00 PM
Room S212 DACA, Ateneo de Naga University

Participants:

System Administrator Specialist, HRMO:	Ms. Leanne Gemelly B. Briones
Researcher:	Johcel Gene T. Bitara Miguel Damien L. Garcera

OVERVIEW**When was the HRIS in our university designed and implemented?**

Ms. Leanne answered that the current HRIS used by the University was likely designed and implemented around 2005 or 2006.

What are the HR tasks that the current HRIS in Ateneo accommodates?

Ms. Leanne stated that the HRIS accommodates HR tasks such as recruitment, employee records management, benefits and wellness offered, training, attendance, and leave management.

What is the workflow of the system for each process/task?

Among the HR tasks that the current HRIS accommodates, Ms. Leanne explains the workflow of recruitment. The recruitment process starts with candidate/applicant sourcing. She mentioned that in the current system, they use email and do not have an online recruitment platform where applicants can apply online. Establishing such a platform is one of their recruitment targets.

After applicant sourcing, the process proceeds to interviews, followed by the submission of necessary documents to HR. Ms. Leanne also shared her vision for the HRIS: starting from the application stage, they want to have a record of all applicants applying for jobs.

Once applicants are hired, their data is manually entered into the HRIS. This includes personal information, all positions the employee has held within the university, and the hire date. After this, the contracts are processed.

For faculty employees, the HRIS records their teaching loads, and the HRMO checks attendance. For non-teaching employees, the system records time-in and time-out using ID cards

Figure B.2: Interview Transcript Page 1.

or online through Adnu's personnel website. For faculty, there is a checker who manually records attendance on paper. This attendance is then manually entered into the HRIS, and the system emails employees if they are absent. The HRIS also includes the generation of reports.

Given the complexity of processes and workflows, Ms. Leanne suggested providing a flowchart for each HR task that the current HRIS accommodates.

What tech stack is used for this system?

Ms. Leanne responded that the current HRIS uses an old version of Visual Basic.Net and MySQL for the Database. And for the web application, it uses PHP: Apache.

Do the HR personnel use GBOX?

Ms. Leanne stated yes. HR personnel use GBOX.

MODULES AND FEATURES

What are the primary modules and features currently in use? Can you clarify each of the modules listed and specify every module with a priority label of High (Priority), Medium (Not required, but good to have for recording), and Low (Not required, can be discarded).

Ms. Leanne stated that the contacts module is no longer used and can be disregarded within development. For the data extractor module, she sets it to high priority due to the importance of ease of simply clicking filter fields to generate reports. Among the priorities of the HR modules are also the personal information, employee profile module, and general employment status tracker.

Ms. Leanne also clarified the assignment module as being among the priorities wherein these include assigning designations to employees, employee's date hired, expiration date, etc. The assignment module also covers the archiving process wherein it contains the archived assignments for keeping track of history. Continuing the list of priorities are faculty rank module, academic profile, employee professional license, training attended, health record, performance evaluation, COE, COE reports, contracts/appointments generation report, and academic awards module. Although the academic awards module, health record, and employee training attended module are not required (Medium), HR still considers them to be implemented as it is good for recording purposes.

Moving forward to the TIMESYS module, Ms. Leanne sets all modules within the list to be of high priority. Starting from the DTR scanner to reporting. She also has set all modules

within LEAVESYS and FACSYS to be of high priority, as they are all required for the University HR records.

USER EXPERIENCE

What are the most common user complaints or issues with the current system?

Ms. Leanne said that among the common user complaints are not being able to login online, as some personnel often forget their own login credentials. Other issues are synchronization, accessibility, or accuracy.

SYSTEM LIMITATIONS

What are the main limitations or challenges you face with the current HRIS? Which processes are most critical and need optimization in the new system? Are there any specific functionalities that are missing or underperforming?

Ms. Leanne mentioned that due to the current tech. stack used – VB.NET along with its outdated version comes with the issue regarding security. As Ms. Leanne mentioned that currently the system database does not support 64 bit architecture devices and has to rely on virtualization such as VirtualBox to use some of the applications of the system. Furthermore, issues with the lack of constraint is a major flaw within the database. HR personnel often have to manually modify directly through the database to change or insert records for other employee concerns. Another issue that the current HR system faces is the issue with an unoptimized reports generation as Ms. Leanne mentioned that generating simple reports takes up-to an hour at minimum to create.

DATA MANAGEMENT

Are there issues with data synchronization, accessibility, or accuracy?

Ms. Leanne stated “true”.

CURRENT REQUIREMENTS

Are there any specific integrations with other systems that are necessary?

Ms. Leanne stated that almost all systems are to integrate with the new HRIS.

Figure B.4: Interview Transcript Page 3

Would you agree that the current system is ‘legacy’ meaning outdated, lacks scalability, and does not allow for growth?

Ms. Leanne stated “true”.

Would you agree that developing a new HRIS system with integration to MIS will greatly improve operational efficiency in the University?

Ms. Leanne stated “true”.

Can you explain more on the faculty ranks? How does it work?

Ms. Leanne explains that they are currently using EPR (Employee Performance Ranking) for the ranking process. After the ranking period, the system generates a report of the employee’s rank, which is then manually encoded into the HRIS. She also stated that the current purpose of the HRIS ranking module is to record the employee’s rank. In redesigning a new HRIS, she wants to include automation in the process to eliminate the manual entry of employee ranks into the HRIS.

DIAGRAMS AND DOCUMENTS

Are there any available diagrams/documents regarding the current HRIS that you can provide? (like ERD, use case diagram, data dictionary)

Ms. Leanne stated that the current HR does not have well documented diagrams for database ERD, use case diagrams, data dictionary/definition, etc. However, Ms. Leanne will provide additional supplementary information regarding the HR forms, workflow, roles/positions, privileges, and process flow charts.

Signed by:



Ms. Leanne Gemelly B. Briones
System Administrator Specialist, HRMO

Figure B.5: Interview Transcript Page 4

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