# **DEBESMSCAT HR Certificate of Employment Generation System**

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1. **Background of the Study**

Human Resource Management (HRM) is responsible for overseeing essential personnel-related functions such as employee record-keeping, contract administration, and the processing of employment documents. In academic institutions, these tasks are critical for ensuring regulatory compliance and supporting internal administrative operations. Despite the importance of these processes, many institutions still rely on manual, paper-based systems for managing employee records and generating documents such as Certificates of Employment. These traditional approaches often result in longer processing times, difficulties in locating information, and a heavier administrative workload, particularly when handling repetitive or time-sensitive requests.

At DEBESMSCAT, personnel data and employment documentation are currently managed through established manual procedures. Although these practices are functional, they require significant time and effort from HR staff, especially when responding to frequent employee requests for documents or reviewing contract details. A staff member within the Human Resources Department identified that the current process for generating Certificates of Employment and retrieving contract information is time-consuming and prone to delays. The lack of a centralized digital system limits the department’s ability to access and process documents efficiently, creating challenges in day-to-day operations.

The development of a web-based system designed to automate the generation of Certificates of Employment and to manage personnel contracts is proposed to address these specific concerns. This system aims to centralize employee information in a digital repository, allowing for more efficient data retrieval and reducing the manual workload involved in document preparation. The implementation of such a system is supported by ongoing technological trends in human resource management, where educational institutions and public agencies are increasingly adopting digital solutions to streamline administrative functions. For example, the University of Melbourne utilizes a centralized HR platform for managing employee records and contract documentation. Similarly, in the Philippines, government institutions are gradually transitioning to digital record-keeping systems as part of broader efforts to improve administrative efficiency and data reliability. Aligning with these developments, the proposed system for DEBESMSCAT is expected to improve the responsiveness and accuracy of HR services by addressing specific operational limitations currently experienced by the department.

1. **Problem Statement**

The Human Resources Department at DEBESMSCAT currently manages personnel data, employee contracts, and the issuance of Certificates of Employment using manual processes. These methods require significant time and effort, particularly when handling frequent document requests and accessing contract details.

This problem requires a solution because the existing approach increases administrative workload and delays routine HR transactions. Although current practices follow established procedures, they lack the automation and centralized data access necessary for efficient record handling. No digital system is currently in place to support these specific HR functions, and manual processes do not provide consistent retrieval speed or reduce repetitive tasks.

1. **Objectives**

***General Objective***

To develop a web-based human resource management system for DEBESMSCAT that will facilitate centralized management of personnel data, tracking of employee contracts, and automated generation of Certificates of Employment.

***Specific Objectives***

1. To design a centralized database for storing and managing personnel records, including employee profiles and contract information.
2. To develop a module for organizing and retrieving employee contract details based on predefined fields.
3. To implement an automated Certificate of Employment (COE) generation feature using institution-approved templates.
4. To create a secure web-based interface accessible only to authorized HR personnel for managing and viewing records.
5. To integrate user authentication functions to restrict access and maintain data confidentiality.
6. To test and validate the system’s functionalities based on the requirements identified during the planning and analysis phase.
7. **Scope and Delimitations**

**Scope**

This project involves the development of a web-based human resource management system specifically designed for DEBESMSCAT. The system will focus on three primary functions: centralized storage and management of personnel data, digital tracking of employee contracts, and automated generation of Certificates of Employment (COE) using institution-provided templates. Authorized Human Resources personnel will be able to add, update, and view employee records and contract details through a secure web interface. The COE module will enable users to quickly generate and print employment certificates by retrieving information directly from the personnel database. The system will include basic data retrieval and viewing capabilities and will implement user authentication features to manage access control. Access to the system will be available only through web browsers on internet-connected devices within the institution’s network environment.

**Delimitations**

This system will be developed as a standalone application and will not include integration with any existing HR or institutional software currently used by DEBESMSCAT. The initial version will not support offline access or the creation of a mobile application, and all interactions will require an active internet connection. The reporting features will be limited to basic data views within the system interface and will not include advanced analytics or customizable reports. The COE generation feature will be restricted to templates provided during the development phase and will not support dynamic template creation or modification by users. Network-level security and broader IT infrastructure protection are beyond the scope of this project and will remain the responsibility of the institution’s existing IT services. Any features not identified and validated during the initial planning phase are excluded from this release and may be considered in future updates.

1. **Significance of the Study**

**Client (DEBESMSCAT HR Department).** The HR department will benefit from a streamlined system that reduces the time and effort required to manage employee records and generate Certificates of Employment. This will support more efficient workflows and help ensure consistency in personnel documentation.

**Users (HR Staff).** HR personnel will experience a more organized and accessible way of handling employee data. The system will minimize repetitive manual tasks, allowing staff to focus on other responsibilities while improving data accuracy and service delivery.

**Employees of DEBESMSCAT.** Employees will receive Certificates of Employment and other requested documents faster through automated processing. This will improve their experience with HR services and reduce delays in completing employment-related transactions.

**The Institution (DEBESMSCAT).** DEBESMSCAT as an institution will benefit from improved documentation practices and centralized access to contract and personnel information, supporting administrative operations and compliance with internal policies and regulations.

**Future Researchers and Developers.** Future researchers and system developers will gain a relevant case study for designing and implementing targeted HR information systems in academic settings. This project may also serve as a foundation for further innovations in digital HR solutions.

1. **Initial Review of Related Systems/Studies**

Digital transformation in human resource systems has become a central area of development in both public institutions and academic environments, where timely access to personnel records and document automation are crucial. The increasing adoption of Human Resource Information Systems (HRIS) reflects the growing need for streamlined administrative processes in both educational and organizational settings. In the Philippine context, Luciano (2020) developed an automated HRIS prototype for private higher education institutions to address challenges in recruitment, evaluation, and promotion, providing a functional basis for integrating document generation features such as Certificates of Employment (COEs). Sunico et al. (2022) also implemented an HRIS at Surigao del Norte State University, focusing on automating employee selection and evaluation processes, which demonstrated the system’s potential to improve inefficient manual HR tasks. The University of the Philippines (n.d.) advanced this trend through its own HRIS platform, incorporating COE application and issuance to improve administrative operations. Likewise, AHORA HRIS by Excent One Inc. (n.d.) offers a web-based solution tailored to Philippine organizations, with features supporting employee records, timekeeping, payroll, and document generation, including COEs. Argana, Sunico, and Francisco (2020) contributed an HRIS with digital archiving functions for employee records and performance evaluations, tested against ISO 9126 standards for quality assurance. Similarly, Manahan, Lacatan, and Miguel (2022) designed a cloud-based HRIS for the University of Cebu, aligned with the Civil Service Commission’s PRIME-HRM framework, offering automated and scalable HR functions including COE issuance. In local government, Moreno and Pengauthors (2024) reported a 60% reduction in onboarding and payroll time through HRIS deployment in Zamboanga City, supporting digital certificate management. Meanwhile, Salo et al. (2023) assessed HRIS usability at Yngen Datacom Corporation and highlighted the critical role of user-friendly design in adoption and functionality. Payday.ph (2024) documented widespread HRIS use among Philippine BPO firms, citing increased accuracy in payroll and employment documentation, including COEs. The HRH2030 HRIS Status Assessment (2020) underscored development gaps in public HR systems, reinforcing the need for scalable COE-generation tools. Philippine HRIS Trends (2023) also identified document automation and compliance as emerging features across digital HR platforms.

Internationally, Kumar, Singh, and Ahmed (2024) confirmed through a systematic review that HRIS enhances HR service efficiency, including document and certificate management. Technological innovations such as blockchain and AI have also influenced HRIS development. For example, blockchain-based systems like Verifi-Chain (Rahman et al., 2023) and NFTCert (Zhao & Si, 2022) offer tamper-proof, verifiable credentialing, which are relevant for COE issuance. The Trusted Achievement Record System (Awaji et al., 2020) and frameworks by Chakraborty and Mansor (2013) provide insights into secure and scalable certificate systems. AI applications in HRIS, such as those described in the Employee Lifecycle Automation Model (2022) and Humedit (2023), demonstrate how document issuance, including COEs, can be further streamlined. In the local public sector, the Department of Education (2021) deployed a large-scale HRIS to manage employee data for over 900,000 personnel, though its structure remains oriented to national operations rather than institution-specific needs. The eDALAYON system developed by III et al. (2024) introduced document monitoring features for the Department of the Interior and Local Government but did not include core HR tasks such as personnel file management or contract tracking. From a global perspective, the University of Melbourne (n.d.) has implemented an HR system with integrated contract management and document generation capabilities, offering a centralized solution that demonstrates the functional maturity and relevance of such systems in modern institutions. These existing systems collectively highlight both the potential and the limitations of current HRIS implementations, underscoring the value of a system tailored specifically for institutions like DEBESMSCAT—particularly one focused on centralized personnel data, contract tracking, and automated Certificate of Employment generation.

1. **Methodology Overview**

This project proposes the use of the **Modified Waterfall Model** as the development approach for the DEBESMSCAT HR Certificate of Employment Generation System. This model provides a structured sequence of phases **Requirements Analysis, System Design, Implementation, Testing, and Evaluation,** while allowing limited, feedback-driven iteration between stages to accommodate adjustments based on user input.

The development will begin with the **Requirements Analysis** phase, where detailed functional and technical requirements will be gathered through various data collection methods. This includes **structured interviews** and **informal consultations** with HR personnel to understand current workflows related to personnel data handling, contract tracking, and Certificate of Employment (COE) issuance. In addition, **direct observation** of existing HR procedures and **document analysis** of current forms, contract templates, and filing processes will be conducted. These techniques ensure that the system's specifications are based on actual practices and operational needs.

In the **System Design** phase, the architecture of the system will be defined, including the layout of the database, user interface designs, user roles and permissions, and overall workflow. Technologies such as **HTML, CSS, JavaScript, Python,** and **PHP** will be employed for both front-end and back-end development, while **MongoDB** will be used for database management.

The **Implementation** phase will involve coding the system using **Visual Studio Code**, integrating the identified technologies to create a secure, role-based web platform for use by authorized HR personnel. This includes building modules for employee data management, contract tracking, and automated COE generation.

Following development, the **Testing** phase will involve several levels of testing, including **unit testing, integration testing**, and **user acceptance testing (UAT)**, to ensure the system functions according to the defined requirements and is usable in the actual HR context.

Finally, the **Evaluation** phase will assess system performance and usability based on feedback from initial users within the HR department. While major revisions will not require returning to earlier phases, the model allows for **limited updates** to improve specific components based on the results of testing and user evaluation. This methodological approach ensures that the final system aligns with DEBESMSCAT’s operational needs while incorporating practical feedback throughout development.

1. **Sample User design Interface**

A building with flags in front of it

AI-generated content may be incorrect.A screenshot of a login form

AI-generated content may be incorrect.A screenshot of a login screen

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.A screenshot of a computer

AI-generated content may be incorrect.A green and white rectangle with a white rectangle

AI-generated content may be incorrect.A screenshot of a computer

AI-generated content may be incorrect.

1. **Gantt Chart/Initial Timeline**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Duration** | **Start Date** | **End Date** |
| Requirements Gathering | 4 days | July 02, 2025 | July 06, 2025 |
| System Design | 6 days | July 07, 2025 | July 12, 2025 |
| Frontend Development | 19 days | July 13, 2025 | July 31, 2025 |
| Backend Development | 31 days | August 01, 2025 | August 31, 2025 |
| Security implementation | 6 days | September 01, 2025 | September 06, 2025 |
| System Testing | 2 days | September 2025 | September 2025 |
| User Acceptance Testing | 4 days | September 2025 | September 2025 |
| Post-defense revisions |  | September 2025 | October 25, 2025 |
| Testing and debugging | 15 days | October 26, 2025 | November 09, 2025 |
| Deployment | 19 days | November 10, 2025 | November 28, 2025 |

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