Data-Driven Analysis of an Integrated Employee Database System for South Sumatra's Tourism and Culture Department

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Abstract

The management of employee data in many governmental organizations remains entrenched in outdated, manual processes that are inefficient and prone to errors. This issue was notably present at the South Sumatra Province Culture and Tourism Office, where the existing method of using Microsoft Excel and Word for handling employee records was becoming increasingly untenable. The manual system not only required excessive administrative effort but also exposed the organization to significant risks of data loss and errors, which are detrimental to effective human resource management. To address these challenges, a web-based information system was developed using the PHP programming language. This system was designed to automate and streamline the entire process of managing employee data, from entry to retrieval and reporting. The system includes several key components: a secure login page, a profile page for quick access to important data, dedicated pages for managing specific types of information such as employee details and position data, and a comprehensive reporting page for generating actionable insights from the data collected. The results of implementing this new system were transformative. It significantly reduced the time and effort required to manage employee data, improved the accuracy of the data stored, and enhanced the security measures protecting sensitive information. The system's user-friendly interface and robust functionality were well-received by the staff, facilitating smooth adoption and integration into daily operations. The new web-based information system has successfully modernized the administrative functions of the South Sumatra Province Culture and Tourism Office. It has established a more reliable, efficient, and secure framework for managing employee data, setting a strong example for similar advancements in other governmental departments. Future recommendations include ongoing updates to the system and continuous training for users to ensure it continues to meet the evolving needs of the organization.

Keywords

Employee Data, Web-based, Integrated Employee Database System

Introduction

 In the modern era, the evolution of information technology has revolutionized how information is accessed and managed, bringing unprecedented speed, precision, and reliability to data-handling processes. This technological revolution is particularly advantageous for public and private organizations aiming to optimize operational efficiency and enhance data security.

However, not all organizations have managed to keep pace with these developments (Al-Saqqa et al., 2020). The South Sumatra Province Culture and Tourism Service, a governmental body under the South Sumatra Provincial Government, serves as a case in point. Despite the widespread adoption of digital technologies across various sectors, this agency continues to employ manual methods for managing its significant workforce, which includes 114 Civil Servants (PNS) and 108 non-civil servant employees (NON PNS). The current process involves the use of Microsoft Excel and Microsoft Word for recording and storing important employee data—a method that is not only outdated but also fraught with inefficiencies.

This manual system of data management requires the personnel department to laboriously input, update, and retrieve employee information, a process that is time-consuming and susceptible to human error (Talukdar et al., 2023). Moreover, such a system significantly increases the risk of data loss and corruption, as files are stored locally without the benefits of redundancy and secure backup options provided by more modern database solutions. The absence of a centralized database further complicates the retrieval of information, making it a slow and arduous task to locate specific employee details when needed (Börjesson et al., 2022).

Given these challenges, there is a compelling case for the South Sumatra Province Culture and Tourism Service to transition to a computerized data management system. Implementing such a system would not only safeguard data integrity and availability but also streamline administrative processes, thus freeing up staff time and resources for more strategic tasks. This move would align the agency with current technological standards and significantly enhance its operational effectiveness and service delivery.

Literature Review

Information systems consist of an organized combination of people, hardware, software, communication networks, data sources, and organized policies and procedures that can store, retrieve, change, and separate information in an organization (Sidik, 2017). Humans depend on modern information systems to communicate with others using a variety of physical devices (hardware), instructions for procedures, information processing (software), communication channels (networks), and stored data (data sources) (Rasmila & Amalia, 2019). From this understanding, it can be concluded that an information system is a system that provides information for management in making decisions and also for carrying out agency operations, where the system is a combination of people, information technology, and organized procedures.

One of the important things in an Information system is a database. A database is a collection of interrelated data and is considered a structured arrangement of data that is stored on memory media (hard disk) whose purpose is so that the data can be accessed easily and quickly" (Raharjo, 2015). "A database is also a collection of interconnected data groups that are organized in such a way that they can be reused quickly and easily" (Aryanto, 2016). So, it can be concluded that a database is a collection of interconnected computerized data that is stored or processed together to meet various needs.

The database processing application used in this research is SQL Server using the SQL programming language, a query language that allows users to create, process, update, and retrieve data. MySQL is a well-known database management system that is now owned by Oracle, and one of the products called MySQL Community Server is "Open Source" (Kadir, 2018).

A website is a collection of pages in a domain that provides various information so that it can be read and viewed by internet users through a search engine (Rosa & Shalahuddin, 2016). Information that can be contained on websites generally contains content, images, illustrations, videos, and text for various purposes. To make the application development more dynamic, the author uses PHP. PHP, or Hypertext Processor, is a language in the form of scripts that allows the creation of dynamic web applications in the sense that it can create web pages that are controlled by data (Kadir, 2018). To display web pages, the author uses HTML (Hypertext Markup Language), which is the basic code that can be used to build web pages (Kawistara & Priyanto, 2017).

Use cases or use case diagrams are modeling for the behavior of the information system that will be created (Rosa & Salahuddin, 2015). A use case describes an interaction between one or more actors and the information system to be created. Roughly speaking, use cases are used to find out what functions are in an information system and who has the right to use these functions.

The South Sumatra Province Culture and Tourism Office was first known as the Tourism, Post, and Telecommunications Service, which was located at Rajawali Street, which at that time was still affiliated with other private offices and was established in 1980 by regional regulations at that time. At the end of 2000, the Tourism Office changed its name to the South Sumatra Province Culture and Tourism Office, which has a vision for South Sumatra to become an advanced and prosperous Cultural Tourism Destination.

Methodology

3.1 Collecting data

To build this Information System, the author needs some data so that the construction of this information system can be developed according to the needs desired by the South Sumatra Province Culture and Tourism Office. The author carried out data collection in 2 ways, namely:

Primary Data
It is a method of collecting data obtained directly from the objects the author is researching, including:

1) Observation
   In this method, the author collects data or information by direct inspection or observation of the personnel department in the South Sumatra Province Culture and Tourism Office. The author sees directly how the personnel department has processed employee data so far.
2) Interviews
   Using the interview method, the author collects data using interviews. The author asked several questions that the author had previously prepared to build this information system to the Personnel Sub-Section, Head of the Culture Division, and Head of the Destination Division at the South Sumatra Province Culture and Tourism Service, who were involved in processing employee data. Ask what things they did with the employee data, along with the problems they found.

Secondary Data
Apart from observation and interview methods, the author also looked for several theories through books, magazines, and media related to the development of employee information systems at the South Sumatra Province Culture and Tourism Service.

3.2 System Development Methods
The system development method that the author uses in building this web-based employee information system is the waterfall method. The waterfall model is a "linear sequential model or classic life cycle [6]. The waterfall model provides a sequential or ordered software life flow approach starting from analysis, design, coding, testing, and support stages."
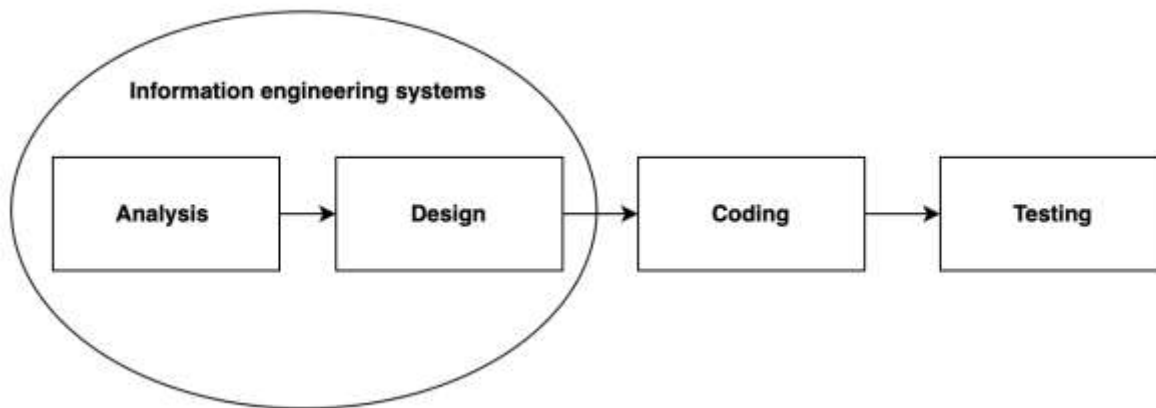

Figure 1.   Waterfall model [6]

3.3 Running System Analysis
Based on the results of observations and interviews conducted at the South Sumatra Province Culture and Tourism Service, which has quite a lot of employees, consisting of 114 Civil Servants (PNS) and 108 NON PNS Employees. Currently, the South Sumatra Province Culture and Tourism Office still carries out the process of managing employee data manually or has not been computerized, as when the personnel department collects data on new employees or transferred

employees, the personnel department must record employee data using the Microsoft Excel, and Microsoft Word.

When employee data is needed, you have to search one by one for the data stored in the Microsoft Excel and Microsoft Word applications. This, of course, takes quite a long time because the required data has to be searched one by one manually. Apart from that, it also does not rule out the risk of file damage and loss of employee data, which cannot be avoided because the data is still not stored in a database as a data storage medium. To overcome this problem, it is necessary to build a Web-based Employee Information System so that employee data processing can be done quickly, precisely, and efficiently.

3.4 System Design

Software design is a multi-step process that focuses on the design and creation of software programs. This stage translates software requirements from the system analysis stage, which continues with thinking about how to form the system.

Use Case Diagram
Use Case is a form of relationship between one or more actors and the information system that will be created. Use Case is used to find out what functions exist in an information system and who has the right to use its functions.

From the Use Case Diagram above, it can be seen that there are three actors related to the system, namely admin, employees, and leaders, and each actor has different access to the system.
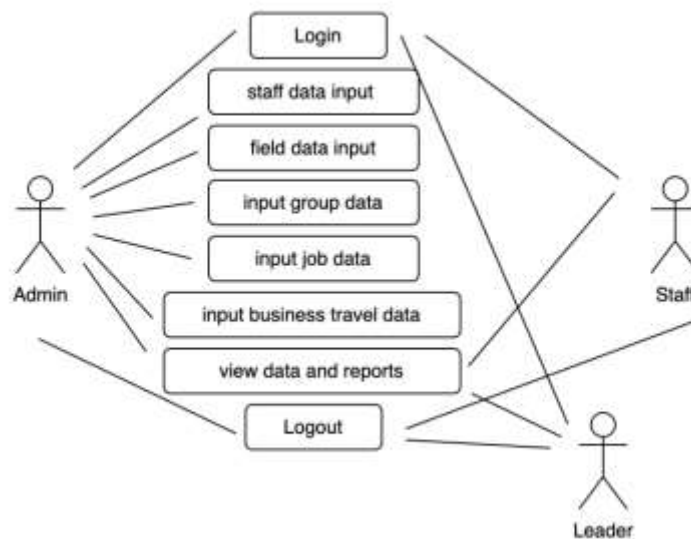

Figure 2.   Use case diagram

Class Diagram
A class diagram is a type of static structure diagram in UML that describes the structure of a system by showing system classes, their attributes, methods, and relationships between objects. Class diagrams are called a type of structure diagram because they describe what must exist in a system

modeled with various components. These various components can represent the class to be programmed, the main object, or the interaction between classes and objects. The class diagram of the web-based employee information system can be seen in the following image.

From the Class Diagram above, it can be seen that there are six data tables, including the Admin table, Official Travel Table, Employee Data, Field Data, Group Data, and Position Data. And all tables are related to each other.

Activity Diagram

In the Unified Modeling Language, activity diagrams are created to explain computer or system activities and the flow of activities in an organization. The following is an Activity Diagram of employee data, which can be seen in the following image.

As can be seen from the image above, the activity is for inputting employee data by the Admin. Before entering the employee information system, the admin is required to log in. Then, the admin can input employee data into the system.

Results and Discussion

4.1 Results

After the author carried out system analysis system design and ended up creating a real web-based information system, the result achieved by the researcher was an implementation of an employee data information system using the PHP programming language to simplify the process of managing employee data at the South Sumatra Province Culture and Tourism Office.

Login Page

This page will appear when we open the site http:/localhost/staff. This page is used by the admin to log in to this website. Then, the admin fills in the username and password to log in and enter the main page. This page is used by the admin to log in.

Figure 3.　　Login Page

Profile Page

This page will appear when the admin logs in and enters the username and password. This page functions for admins to view available Employee Data, Fields, and official travel.

Figure 4.   Profile Page

Employee Data Page
This page will appear when the admin logs in and clicks on Employee Data in the menu. This page is only used to view, input, edit, and delete employee data by the admin. This page will appear when the admin clicks the menu on employee data and then clicks add employee data. This page is used by the admin to input employee data containing Name, NIP, Place of Birth, Date of Birth, Religion, Employee Status, Marital Status, Information, Class, Position, TMT (Starting Date), Education, Fields, and Address.
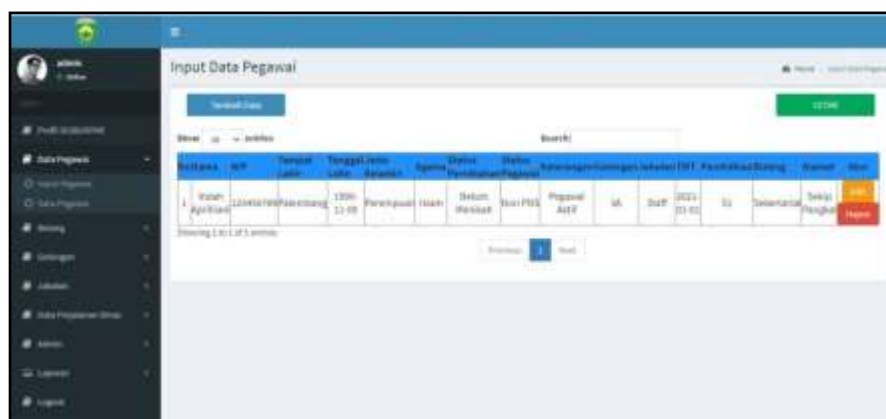

Figure 5.   Employee Data Page

Field Data Page
This page will appear when the admin logs in and clicks on Field Data in the menu. This page is only used to view, input, edit, and delete field data by the admin.
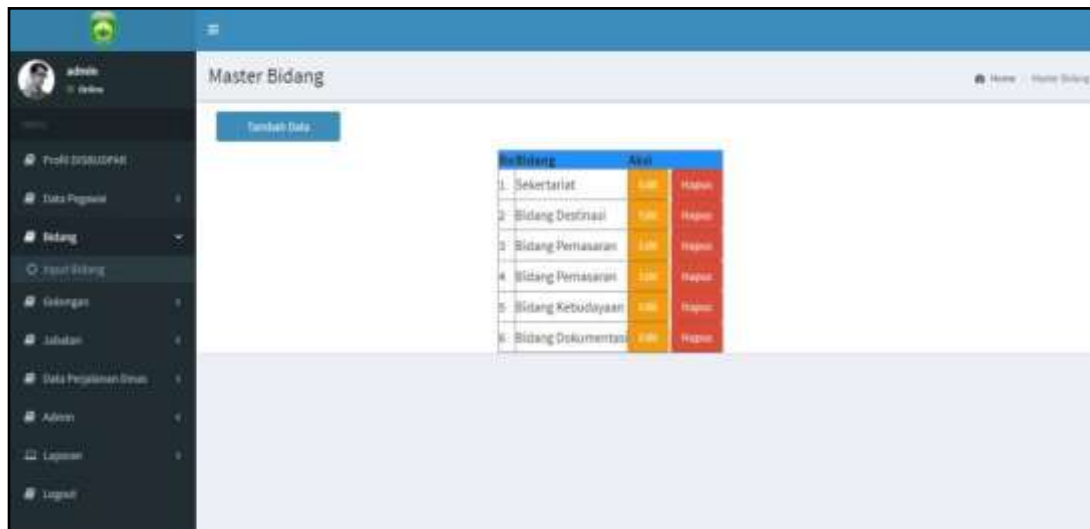
Figure 6.   Field Data Page

Position Page
This page will appear when the admin logs in and clicks on the position in the menu. This page is only used to view, input, edit, and delete positions by the admin.

Figure 7.   *Position Page*

Group Page

This page will appear when the admin logs in and clicks on the Group in the menu. This page is only used to view, input, edit, and delete Groups by the admin.

Figure 8.   Group Page in Admin

Reports Page

This page will appear when the user logs in and clicks on the employee data report and official travel data in the menu.

Figure 9.   Employee Data Report Page

4.2   Discussion

The deployment of a web-based information system at the South Sumatra Province Culture and Tourism Office marks a significant step forward in the administrative management of employee data. Developed using PHP, the system streamlines the process of inputting, updating, and accessing employee information through a series of well-designed web pages. Each page is tailored

to handle specific aspects of employee data management, from personal and employment details to organizational structure and reporting.

The system begins with a secure Login Page, ensuring that access is restricted to authorized administrators only, thereby safeguarding sensitive employee information. Upon successful login, administrators are directed to the Profile Page, which serves as a central dashboard providing quick access to employee data, departmental fields, and official travel records. This integration enhances the efficiency of data management, allowing for quick updates and retrievals that significantly improve administrative workflows.

Further into the system, specialized pages such as the Employee Data Page, Field Data Page, Position Page, and Group Page allow for detailed management of various organizational components. These pages facilitate the addition, modification, and deletion of data, catering to dynamic organizational needs and ensuring that the system remains up-to-date. The ability to manage positions and groupings within the organization also supports structural alignment and fosters better team collaborations.

Lastly, the Reports Page adds a strategic layer to the system by enabling administrators to generate comprehensive reports on employee data and official travel. These reports are crucial for auditing, compliance, and planning, providing insights that are integral to informed decision-making and operational adjustments. Overall, the implementation of this digital system not only optimizes administrative tasks but also positions the South Sumatra Province Culture and Tourism Office to leverage technology for enhanced efficiency and security in managing its workforce.

Conlusions

The introduction of the web-based information system at the South Sumatra Province Culture and Tourism Office has significantly revolutionized the way employee data is managed within the organization. Through the effective use of PHP programming, the system has automated the previously manual processes, enabling more efficient, accurate, and secure management of employee information. This digital transformation aligns with modern administrative practices and addresses the critical needs of data accessibility and integrity that were lacking in the manual system.

The system's structured user interface, featuring specific pages for various administrative functions such as employee data management, position handling, and report generation, ensures that data is not only more accessible but also easier to manage and update. By streamlining these processes, the system effectively reduces the administrative burden on staff, minimizes the potential for human error, and enhances the overall productivity of office operations.

Furthermore, the security features embedded within the system, starting with a robust login page, safeguard sensitive information against unauthorized access, thereby enhancing data privacy and protection. This is a crucial aspect, especially in public sector organizations where data security is paramount.

The implementation of the web-based information system marks a significant milestone for the South Sumatra Province Culture and Tourism Office, setting a precedent for other regional offices to follow. It not only improves the efficiency and accuracy of data management practices but also contributes to a more organized, secure, and effective administrative environment. Future enhancements and continuous user training will further solidify the benefits of this system, ensuring it remains relevant and functional in the face of evolving technological advancements.

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