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Design and Build System Applications Design and Build Information System Applications IT Infrastructure Training and Training

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Abstract− To speed up IT infrastructure training for employees in the information technology department, PT. Pelabuhan Indonesia (Persero) Regional 1 Belawan Branch needs to change its current conventional training management to information technology based. This is needed because the large number of employees and large areas require efficiency in organizing training. The proposed solution is the development of a web-based information system using PHP and MySQL to make it easier to manage training and access information for organizing staff wherever they are. Web-based IT Infrastructure Training uses a PHP program with a MySQL Database so it is hoped that this information system can help the Administration Section staff to easily access information about training from anywhere and at any time using internet facilities.

Keywords: Information System, Training IT, Persero

1. INTRODUCTION

Overall, the education situation in Indonesia raises concerns, especially because there are still many IT personnel who do not meet adequate qualifications and quality standards. This is due to the large number of graduates only reaching senior secondary education (SLTA) level according to education data in Indonesia. Therefore, the government feels the need to address this problem seriously, including through the use of training institutions such as the Center for Science Development in the field of Information Technology Infrastructure, which is widely located in North Sumatra, to increase a person's knowledge and professionalism in this field.

Training, which is abbreviated as diklat, refers to a series of processes that aim to improve the skills and knowledge of an employee to achieve certain organizational goals. The organization in question can be a company in general, while training participants refer to employees specifically. Training can be considered as a means to explore aspects that are not yet understood regarding professionalism. As is known, employees are expected to always have competence, creativity, and professionalism. To make this happen, the government through the Ministry always strives to facilitate employees in developing work professionalism, one of which is through training programs.

Design is an activity that aims to design a new system that can overcome the problems faced by the company by selecting the best alternative system [1]. Development, on the other hand, is an activity to create a new system or replace or improve an existing system, either in whole or in part. Design and construction refers to the process of building a system to create a new system or improve an existing system, either in whole or in part. The term "design" refers to the procedures necessary to translate the results of system analysis into a programming language to describe implementation details of system components. This process involves drawing up detailed specifications for the development of a new system. The term "building" refers to the activity of creating a new system, replacing, or improving an existing system, either in whole or in part [2].

According to [3], Design and Construction can be explained as activities to create a new system or repair or replace an existing system completely. Applications, as stated [4], are programs that are ready to be used to carry out commands from users to produce output that is by the purpose of creating the application. Applications can be defined as solutions to problems that use data processing techniques and focus on achieving desired results through computing. PT. Pelabuhan Indonesia (Persero) Regional 1 Belawan Branch is one of the Indonesian State-Owned Enterprises that focuses on port services in Indonesia. Currently, Pelindo 1 operates 16 port branches in four provinces, from Nanggroe Aceh Darussalam to the Riau Islands. Pelindo 1's geographical location is in the western region of Indonesia and faces directly the Malacca Strait, one of the busiest shipping lanes in the world, making it play a crucial role in connecting international trade networks based on sea transportation in Indonesia.

In the port business, inappropriate decisions can have serious impacts on the continuity of the company and its future. This business continues to develop and change over time. Every day, Pelindo 1 is faced with new challenges, targets that must be achieved, and various business problems. These challenges include problems such as data overload, the large number of available choices, and an abundance of irrelevant data, making it difficult for decision-makers to make the right decisions. The system implemented at PT. Pelabuhan Indonesia (Persero) Regional 1 Belawan Branch has been well structured and integrated, especially in improving employee capabilities in the IT field. However, data shows that the number of employees who need to improve their qualifications and competencies is very large and spread across all Indonesian Port offices. Therefore, it is difficult to provide comprehensive training to all employees due to limited costs

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and the number of training institutions available. As an alternative, training is carried out in stages and continuously with the hope of covering all employees within an adequate period.

2. RESEARCH METHODOLOGY

2.1 Analysis

A system, derived from Latin (systēma) and Greek (sustēma), is an entity consisting of components or elements that are connected to facilitate the flow of information, material, or energy. In another context, a system can be explained as a collection of elements or elements that are interrelated and influence each other in carrying out joint activities to achieve a goal, such as computer systems, accounting systems, and others. According to Ludwig Von Bartalnfy, a system is a collection of elements that are interconnected in a relationship between these elements and the environment. A similar view was expressed by Anatol Rapoport, who defined a system as a collection of interrelated units and sets of relationships. L. Ackof also stated that systems analysis involves a conceptual or physical unity consisting of parts that are interdependent with each other. The definition of a system [4] emphasizes that a system is a combination or collection of sub-systems, both tangible and intangible, that are connected and work together in harmony to achieve certain goals. From these various definitions, it can be concluded that a system is a collection of organized components that are interrelated and function together to achieve various goals that vary in each case, [5].

2.2 Knowladge Management System

Knowledge Management is a strategy used by companies to recognize, create, represent, distribute, and facilitate the adaptation of insight and experience. This insight and experience includes knowledge, both owned by the individual and related to the company's standard processes or procedures. The main goal of Knowledge Management is to maintain and convey crucial knowledge to employees effectively. According to Ahlawat & Ahlawat in a journal written [6], a Knowledge Management System (KMS) is the application of modern information technology to systematize, improve, and accelerate knowledge management within and between organizations. KMS is a framework that integrates people, processes, and technology to improve performance and learning to achieve sustainable growth. [7] quoted in the same journal also describes the Knowledge Management System as an effort used by companies and industries to achieve Knowledge goals. Management using information technology.

In designing Knowledge Management, several system parameters must be considered, as explained [8]. These parameters include (a) Availability of systems, which should support the process and culture of information sharing. (b) The reliability of information in Knowledge Management must be maintained. (c) Storage, indexing, and searching methods should be simple but effective. (d) The system should be easy to access, taking into account that the devices used to access it should be spacious and easy to access.

The KMS architecture is designed to capture knowledge and facilitate the Knowledge Management process to be effective and efficient. The following is an overview of the architecture of the Knowledge Management System in general, complete with the components contained in the Knowledge Management System architecture.

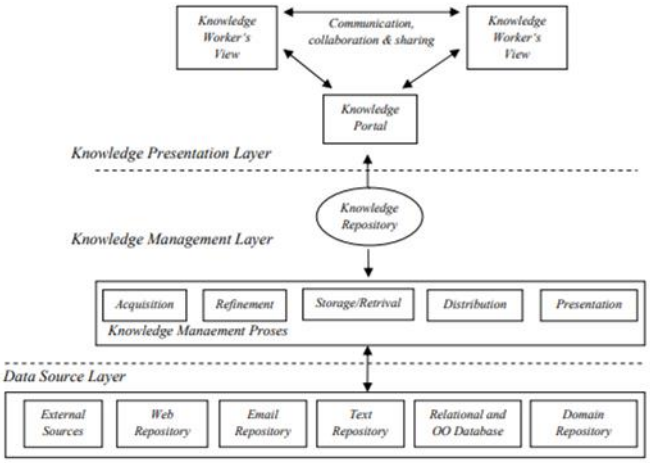

Figure 1. Knowledge Management System Architecture

2.3 PHP and MySQL

PHP is an abbreviation for Personal Home Page Tools and PHP (PHP: Hypertext Preprocessor) is a script that is added to HTML and functions on the server side, which means this script is executed on the server and the results are sent to the user's browser. PHP allows the transformation of web pages from static to dynamic by integrating applications into HTML [9]. MySQL is open-source database software, which means its source code is freely available to download

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and use in software development. The MySQL source code can be downloaded for free from the internet and can be run on various operating systems because it is multiplatform [10]. MySQL is a multiuser database that uses SQL (Structured Query Language) as the standard language for accessing the database server. With SQL, access to databases becomes easier compared to other languages. Apart from that, MySQL is capable of storing data in large capacities, reaching up to 100 GB [11].

2.4 Basic Web Concepts

Currently, technological progress is developing rapidly, which is triggered by various factors including the rapid development of society's mindset. To meet the need for information, knowledge, and the demands of an increasingly mechanized world of work, web application developers are urgently needed to be able to continue to innovate and meet these needs. The web is a network that makes it easier and faster to convey information widely, and can be accessed easily and quickly by anyone who has internet access. A web browser is a tool or application used to search for information, open or explore internet pages via the web.

3. RESULT AND DISCUSSION

3.1 Problem Analysis

The training system currently in use still uses a manual approach, where data regarding the training to be implemented is obtained from the results of the Training Needs Assessment (TNA) carried out at PT. Indonesian Harbor (Persero) Regional 1 Belawan Branch. Data regarding prospective training participants is sent to the leadership to review and check the employee's history. Then, the Program section carries out a selection stage to determine whether the candidate meets the established criteria. Basic criteria include: 1) Prospective participants have never attended the same training, and 2) Prospective participants meet the initial knowledge requirements (behavior) according to the training chosen. The steps in this procedure follow the steps set out in the training participant calling system, namely as follows: (a) Information about prospective training participants is obtained from the leadership via email, which contains information about the training that will be carried out by the results of the TNA. This information includes a list of prospective training participants recommended by the training institution. (b) After the training institution receives data on prospective training participants from the Program section, they carry out a selection to determine whether there are participants who have taken the same training before and whether there are those who do not meet the required initial knowledge criteria. The list of participants who meet these criteria is submitted back to the training institution to be forwarded to the relevant leadership so they can take part in the training. (c) Reports are prepared to recapitulate the list of names of training participants.

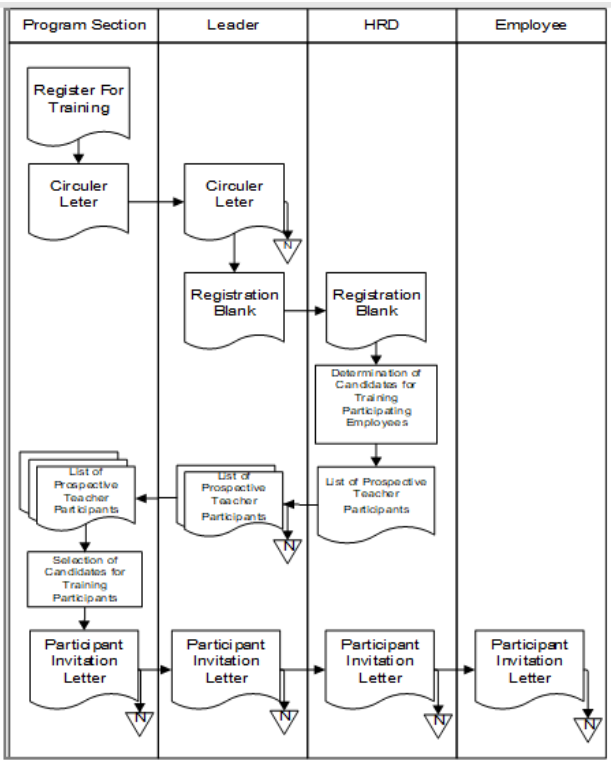

Figure 2. Curren System Document Flow

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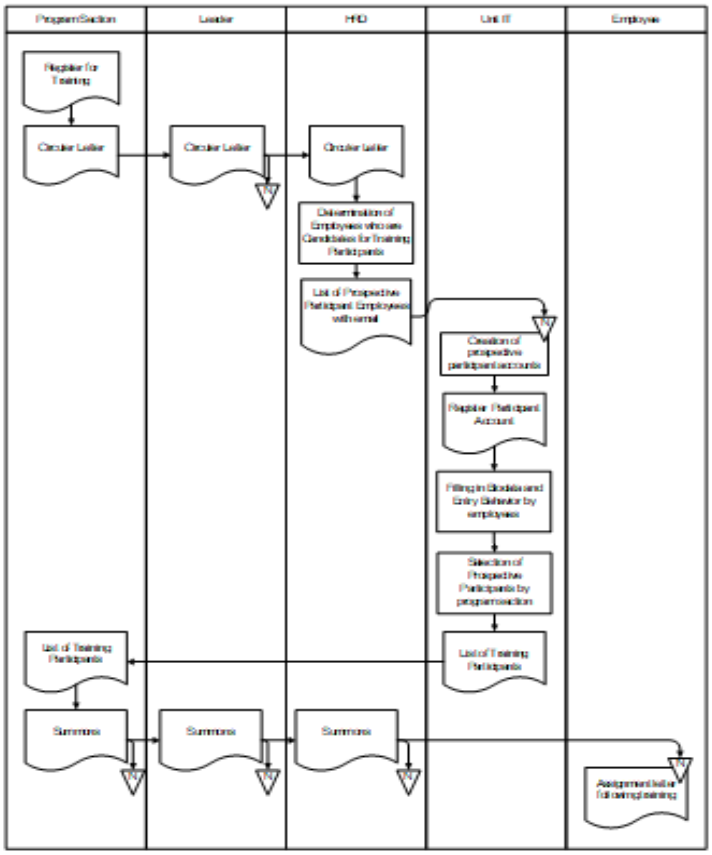
3.2 Evaluation Analysis of The Running System

From the sequence of procedures, it can be seen that the circular sent to educational leaders is an explanation of the TNA results which are then used as a list of training that will be implemented. After receiving a circular from the training institution, the task of the program section is to ask HR for a list of names of employees who will be proposed as training participants. Based on the choice of HR, the names are then submitted to the leadership to be forwarded to the training institution through the program section. After all names have been collected according to the specified time limit, evaluation and selection of the proposed names are carried out. Selection criteria include whether the participant has attended the same training at a previous training institution and whether they have the initial knowledge required to take the training.

3.3 System Design

Global design, or what is also known as conceptual design or logic design, is a conceptual system design process that aims to improve the current system. In this global design, the author details the architectural structure of the proposed system, including input, process, and output hierarchies, context diagrams, data flow diagrams, and entity relational diagrams. Considering the current conditions where the data collection process for prospective training participants is carried out manually, in the proposed system, the data will be input directly into the computer online to ensure the validity of participant data and initial knowledge, as well as to store the data directly into the database. This approach will increase the efficiency of filling in data because data can be directly input by prospective training participants and immediately received by the program section simultaneously due to the online nature of the system. The document flow of the proposed system can be seen in Figure 3 below.



3.4 Diagram Context

The system development process begins with creating a context diagram to determine the flow and processing of data as well as compiling information in the form of the desired report. In the context diagram of the training participant admission information system, four entities are involved, namely the program section, leadership, HR, and employees as training participant objects. The context diagram form of the training participant admission information system is as follows:

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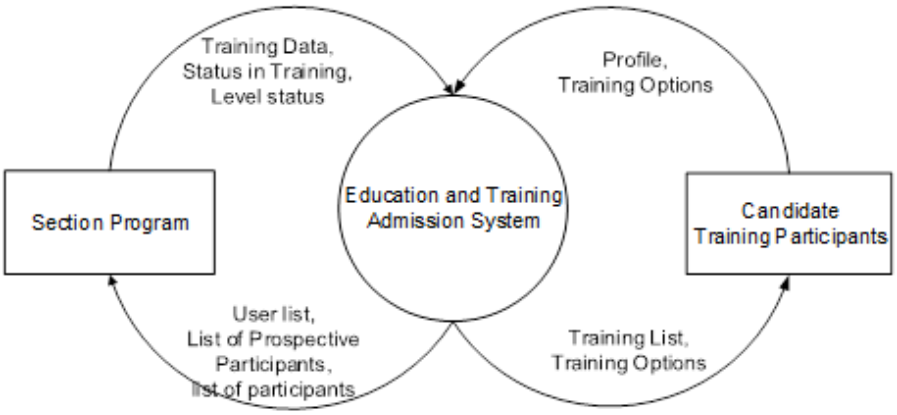

Figure 4. Contex Diagram information System for Admission of Training Participants

Entity Relationship Diagram (ERD) is a visual representation of the relationship between each entity or attribute of a file that is used to integrate data to enable the design of the desired report or data input. The following image explains the Entity Relationship Diagram (ERD) flow from files designed for data processing applications for prospective training participants:

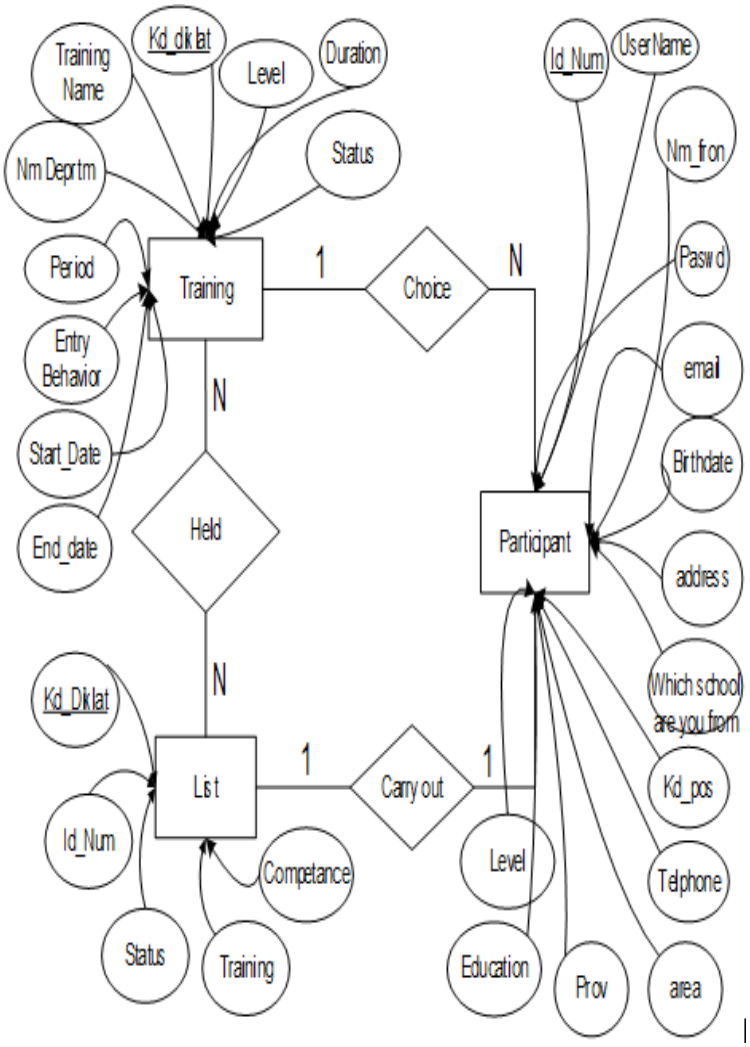

Figure 5. Entity Relationship Diagram (ERD) Information System for Prospective Training Participants

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3.5 Detailed System Design

Detailed design, also known as system physical design or internal design, is the design of the physical form or architectural structure of a proposed system. When designing a system, it is important to pay attention to the factors that will support the system, making it easier to process data in the future. It is hoped that processing this data will make it easier to present, provide services, and create various necessary reports. Based on these considerations, the author will explain in more detail the proposed system design, as depicted in the image below:

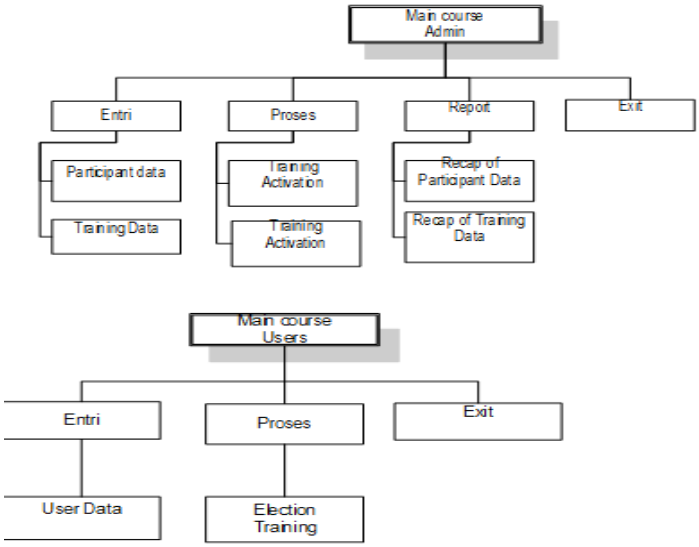

Figure 6. Main Menu Data Processing Information System for Prospective Training Participants

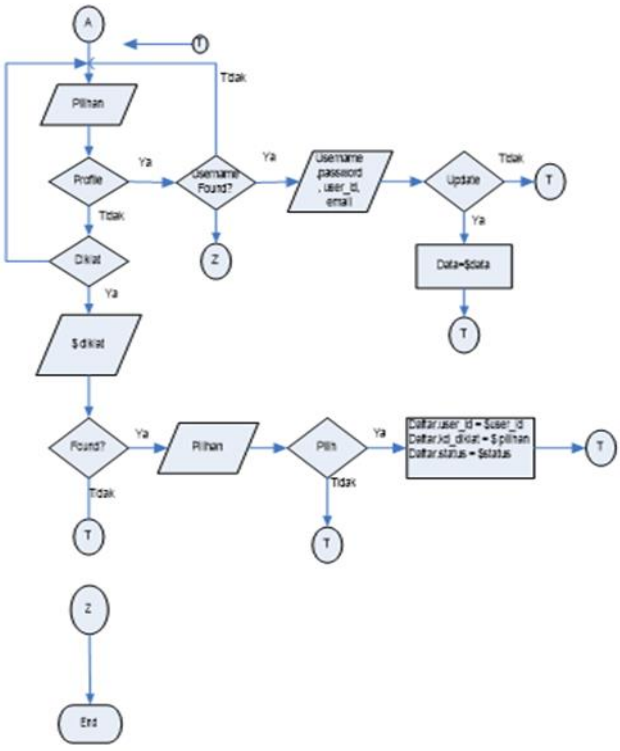

Figure 7. Administrator and User Program Logic

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4. CONCLUSION

When conducting research on education and training information systems (Diklat) in the Information Technology Sector which still uses semi-computerized systems, the author concluded several things as follows: (a) Education and training information systems can be run well in the program section so that they can support smooth running Information Technology Training and Training activities, (b) The system can provide information about training that is valid and can be accounted for by the leadership, making it easier for prospective participants to get the information they need, (c) The use of an information system that uses PHP and MySQL database makes it easier for users to access system without time and place limitations, (d) Make it easier for the program section to process training data.

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