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Design and Development of a Field Work Reporting System Application for Metro Interior

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Abstrac− This research aims to design and build a reporting system application for field workers at Metro Interior, a company specializing in interior design. In its operations, Metro Interior faces challenges in efficiently monitoring and managing field workers' activities, which affects report delays, data accuracy, and suboptimal coordination. The designed application will serve as a solution to these issues by providing a platform that allows field workers to create reports directly from the work site. The main features of this application include real-time reporting, task management, project progress tracking, and data collection related to field activities. The application development methodology involves user needs analysis, system design, software development, and system testing. The application is designed using the latest technology to support both mobile and desktop devices, enhancing accessibility for users both in the field and in the office. The expected outcome of this research is to improve reporting efficiency, data accuracy, and coordination between field workers and management teams at Metro Interior. With the implementation of this application, Metro Interior will be able to better monitor and manage projects, reduce administrative errors, and accelerate data-driven decision-making.
Key: Field Work, Metro, Design and Development

1. INTRODUCTION

Metro Interior Medan is a company engaged in interior design, specifically specializing in the installation of curtains in customers' homes. The high demand and ordering of curtain installations by field workers, particularly when visiting customers' homes, make these workers a central component in carrying out their tasks and reporting back to the company. The data management in the administrative office of Metro Interior Medan is still manual, especially in sharing knowledge related to field workers' reports. Difficulties in data transmission, obtaining up-to-date information, and manual data storage result in ineffective performance. This process affects employee performance due to excessive waste of time, energy, costs, and mental resources. The current development of technology has greatly assisted humans in performing tasks, making them easier, faster, and more accurate [1] Until interpersonal communication [2].

The processing of field workers' data is indeed well-organized, but much of the data processing is still done manually. For example, field workers' reports are often in written form, making data transcription less effective and leading to errors in reporting. This can also result in data accumulation, making it difficult to report when the data has piled up. The main drawback, especially in terms of time, is that manual reporting inevitably causes delays, leading to an accumulation of records and reduced efficiency.[3].

Globally, information and communication technology encompasses all aspects involving technology, engineering, and management techniques used in controlling and processing information and its use. There are three main components of technology-based learning: computers, multimedia, and telecommunications. Additionally, information and communication technology represents an inseparable state that includes a broad understanding of all activities related to the processing, manipulation, management, and transfer of information across media. This adjustment requires a culture shift towards multiculturalism. [4]With the advancement of technology, humans are required to perform all tasks quickly and accurately. Moreover, technology and information systems are crucial in managing both business operations and organizations in their daily activities. [5].

One of the activities at Metro Interior Medan involves coordinating and checking field workers, which is a primary tool for the company in serving the public. It can be said that all companies have divisions for installation and corrective functions in the field. Broadly speaking, the installation and corrective functions serve a dual role: providing services to customers and delivering information or reports in line with company objectives. To address this issue, an open-source application for knowledge sharing is being developed. This application, built using Visual Studio as its programming language, is expected to save on costs, time, effort, and mental resources.

Currently, there are still companies or institutions with programmed data, but the data within these programs is often incomplete, leading to slow data processing and analysis. For example, field workers' reports or other related data before tasks are performed. Therefore, a new, more comprehensive program is needed to avoid such errors. With a more comprehensive programmed information system, the processing of field workers' reports will help improve performance and make data processing more efficient and straightforward.

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2. RESEARCH METHODOLOGY

2.1 Rancang Bangun

Design is one of the crucial aspects of programming. The purpose of design is to provide a clear and complete picture to the programmers and engineers involved. The design should be useful and easy to understand so that it is straightforward to use. Design, or planning, involves a series of procedures to translate the results of analysis and a system into programming language to describe in detail how the system components will be implemented [6]. Thus, the concept of design and development can be understood as the process of translating analysis results into software form, leading to the creation of a new system or the addition of features to an existing system [7].

2.2 Aplikasi

The term "application" comes from the English word "application," which means implementation, application, or use. In a more specific sense, an application is a program designed to perform a function for the user and other applications, intended for a specific target. According to the Executive Computer Dictionary, an application is a problem-solving tool that uses a particular data processing technique, usually aimed at achieving desired or expected computations and data processing [7].
An application is a ready-to-use program that can execute commands from users with the aim of producing results that are more accurate in line with the application's intended purpose. It refers to solving problems using a specific data processing technique, usually aimed at achieving the desired or expected computations and data processing [8].

2.3 Knowledge 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. [9], 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. (John Blair 2020) 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. 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. [10].
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.

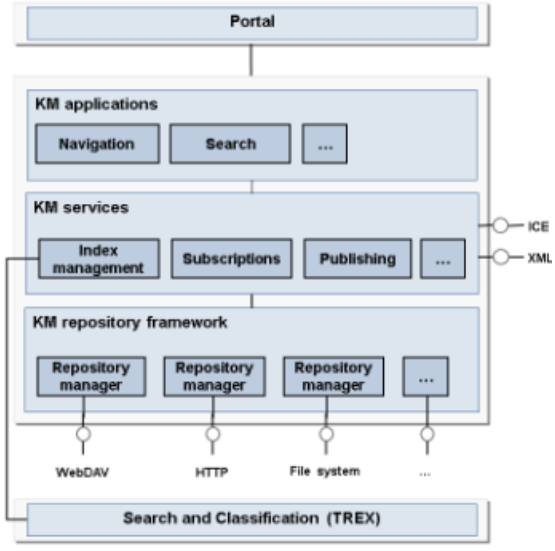

Figure 1. Knowledge Management System Architecture

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2.4 PHP and MySQL

PHP menurut Anhar (2010 : 3) adalah bahasa pemrograman web server-side yang bersifat open source, PHP juga merupakan script yeng terintegrasi dengan HTML dan berada pada server (server side HTML embedded script). PHP juga merupakan script yang digunakan untuk membuat halaman website yang sangat dinamis, dinamis berarti halaman tampilan yang akan ditampilkan dibuat saat halaman itu diminta oleh client. PHP pertama kali dibuat oleh Rasmus Lerdorf seorang pemrogram C yang handal dari greenland Denmrak di tahun 1995, PHP diberi nama FI (Form Interpreted) yang digunakan untuk mengelola from dari web. Pada perkembangannya, kode-kode yang digunkan dirilis untuk umum sehingga mulai banyak dikembangkan oleh programer diseluruh dunia. 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[11]. MySQL is open-source database software, which means its source code is freely available to download 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 [12]. 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 [13].

RESULTS AND DISCUSSION

3.1 Analisis Prosedur

Procedure analysis is an activity resulting from a process based on received inputs. In analyzing the Field Workers' Reporting procedure, a tool called Flow of Document (FOD) is used.

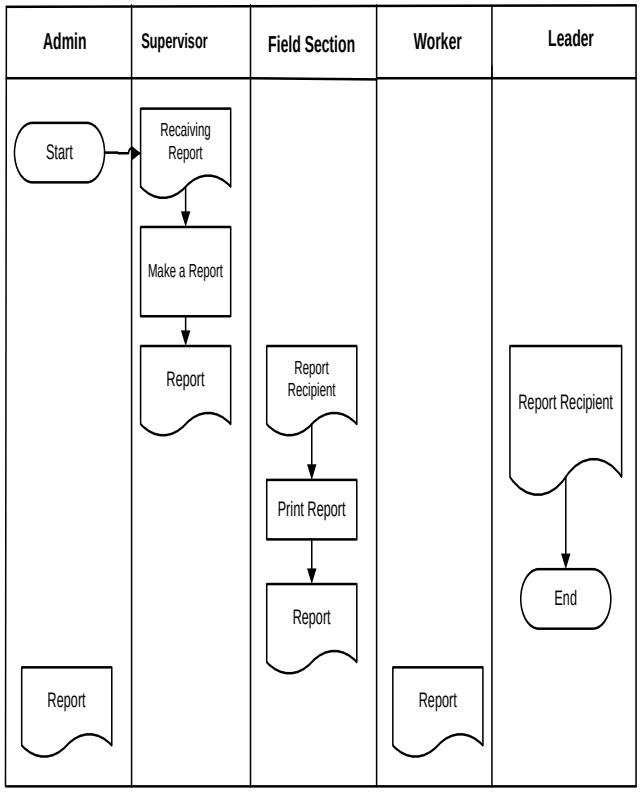

Figure 2. Curren System Document Flow

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

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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.

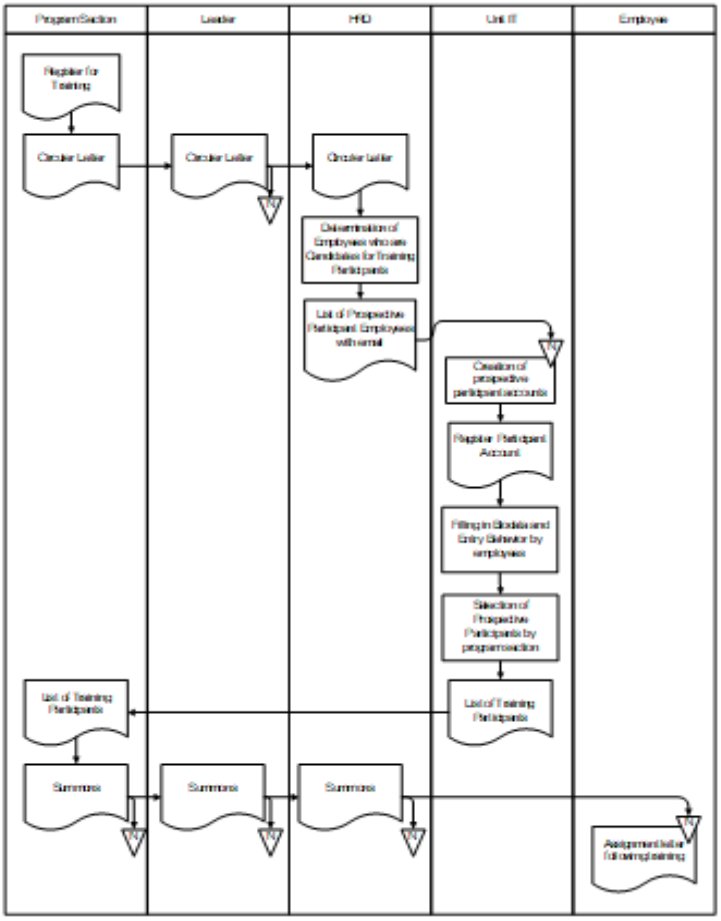

Figure 3. Procedure Analysis

3.4 System Design Methods to be Developed

System design can be defined as the depiction, planning, and creation of sketches of various separate elements into a cohesive and functional unit. The system design methods outlined in this thesis include input design, process design, output design, database design, system design, and interface design. The process design section contains diagrams of the process modeled with DFD (Data Flow Diagram). The DFD design can be seen in Figure 4.

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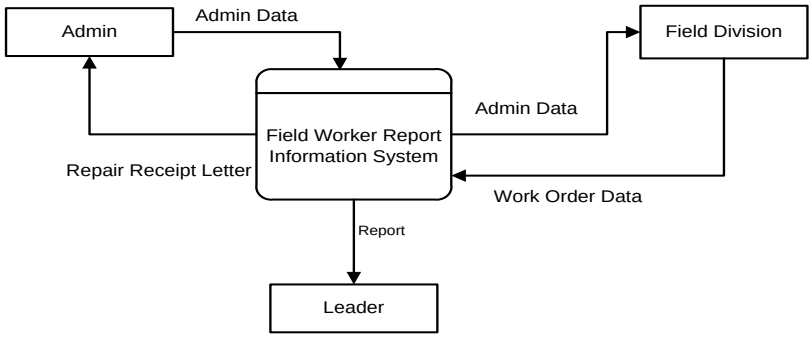

Figure 4. Context Diagram of the Field Workers Reporting Information System

From the context diagram above, it can be explained that the data input is admin data. The process begins with the Admin reporting issues to the field department. Then, the employee receives the report from the admin and promptly reports it to the repair department to assign workers to the field. Subsequently, the worker will receive a Work Order for Repair from the Field Manager, which the worker will take with them when performing work in the field.

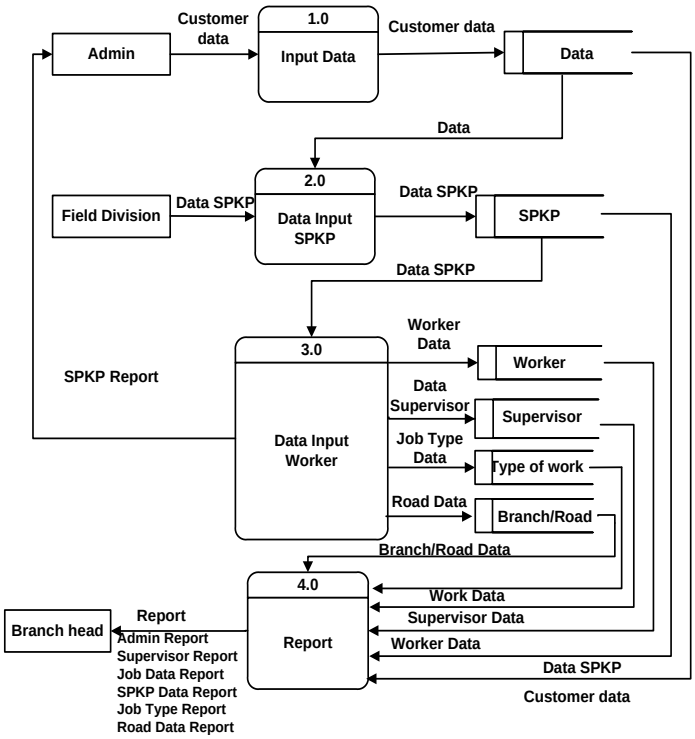

Figure 5. Data Flow Diagram Level 0

3.5 Database Design

A database system is an organized system that is interrelated and used collectively to store data within an organization, enabling it to provide the necessary information for decision-making processes. Based on the data discussed, a database can be designed for this system using an Entity-Relationship Diagram and normalization. The Entity-Relationship Diagram is used to identify the entities required for the system being developed. For further clarification, see the following diagram.

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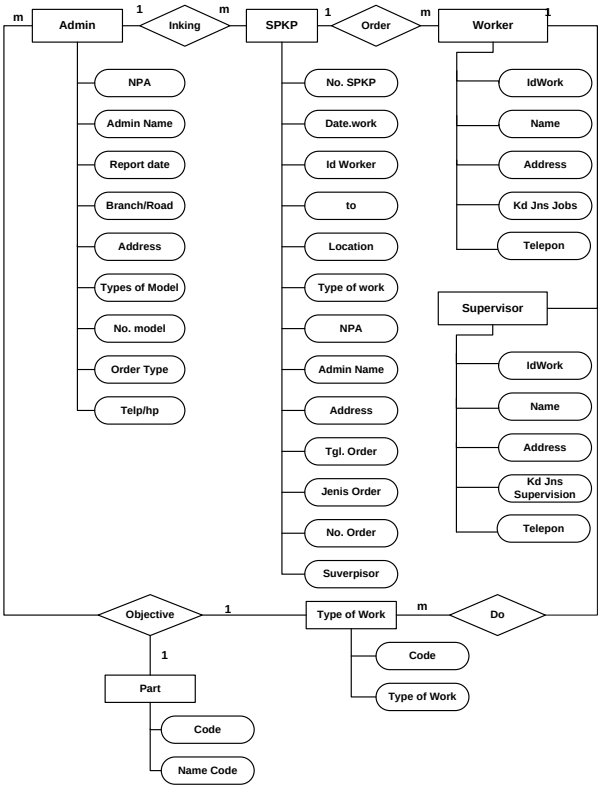

Figure 6. Entity Relation Diagram

3.5 Flowchart Design

The system design is illustrated with a flowchart, which details the system based on the Field Workers' Reporting Information System being designed. The main modules and menus, as well as the submenus of the designed program, are depicted in the following flowchart.

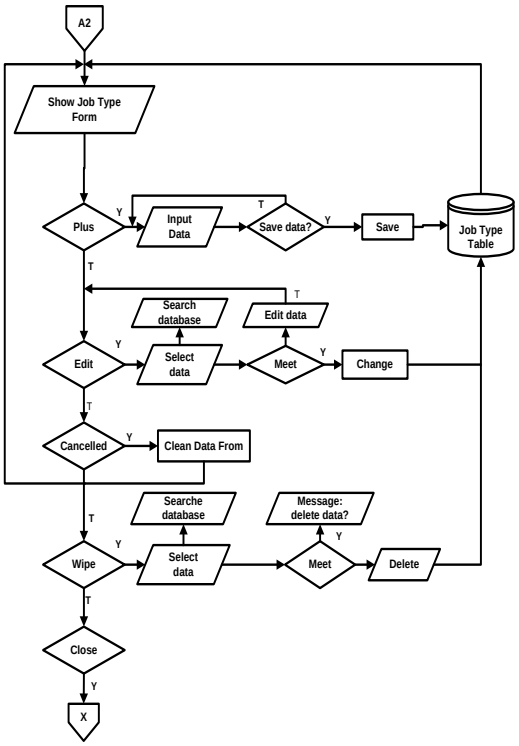

Figure 7. Flowchart Job Type Data Form

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3.5 Interface Design

The interface design is a depiction of the structure that shows the activity flow of the entire system being designed.

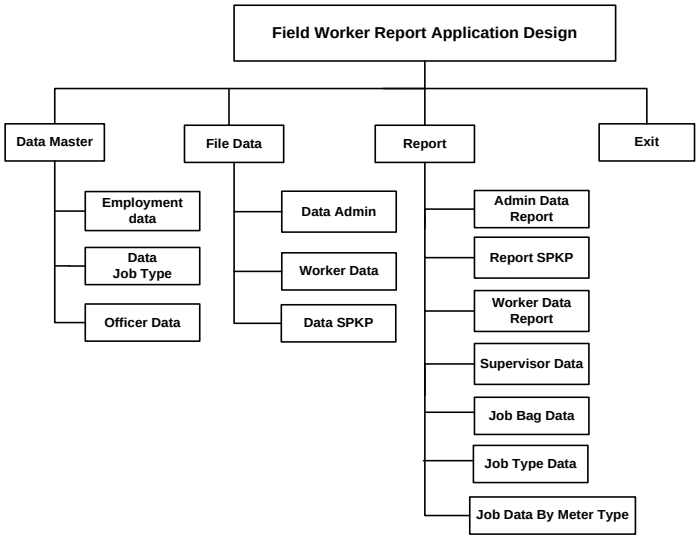

Figure 8. Interface Design

3. CONCLUSION

The application is designed to enhance the efficiency of the field workers' reporting process by enabling workers to submit reports in real-time via information technology devices. This reduces the time required for data collection and the delivery of information to management. With this application, Metro Interior's management can easily access and monitor reports from various field locations, which aids in faster, data-driven decision-making. The application provides features for managing and storing report data in a structured manner. This facilitates information retrieval, trend analysis, and better job record management. The application supports improved communication between field workers and management. Features such as notifications, messaging, and report statuses help ensure that important information is not overlooked. The development of this application considers ease of use for field workers who may not be very familiar with technology. It is designed with security features to protect report data and workers' personal information. Data encryption and strict access controls ensure that only authorized parties can access sensitive information. Overall, this reporting system application is designed to support Metro Interior in managing fieldwork more effectively, improving productivity, and ensuring that the reporting process runs smoothly and efficiently.

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