Development of a Training Information System Using MS. Access (Case Study of PT XYZ)

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This research aims to develop a training information system using Microsoft Access at PT XYZ to overcome the problem of managing employee training data faced by trainers. The research was conducted during the internship period from 7 August 2023 to 8 April 2024, with qualitative methods that focused on system development. The research results show that the training information system developed has succeeded in increasing the efficiency of training planning, tracking and management, as well as ensuring the availability of employee competency gaps and compliance with regulations. System feasibility testing shows that this system is suitable for use. This system allows companies to ensure each employee receives training as needed, while increasing the effectiveness of management operational training. Suggestions for further research include analyzing the effectiveness of the system in increasing employee competency and productivity as well as reviewing data security aspects to protect employee information and training.

Keywords: information system development, training, Microsoft Access, system feasibility

1 Introduction

PT XYZ, which was established in 1993, is a company that always organizes various types of training, including internal, external, and in-house training. These training sessions are conducted both offline and online to ensure that employees possess the required competencies. The success of these training programs is measured by competent outcomes as defined in the Labor Law No. 13 of 2003, Article 1, Clause 10 (kemenperin, 2003).

Training participants are selected by the superintendent through the completion of a training needs analysis (TNA) form, listing the names of employees who require training. This form is then submitted to the human resources (HR) department for the selection process, and the names of those who meet the criteria will be eligible to attend the training.

In managing training data, trainers at PT XYZ face challenges in planning and conducting training sessions, including managing schedules that overlap with employees' work schedules. This can affect the effectiveness of the training and cause inconvenience for the employees. Below are the annual training data at PT XYZ:

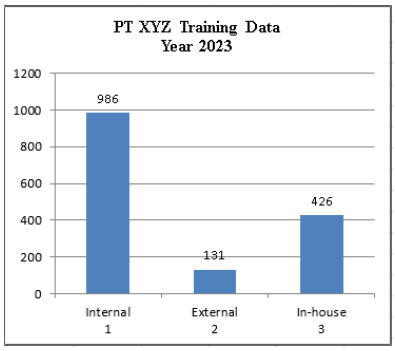


Figure 1.1 training record 2023

From the data above, it is evident that the training participants at PT XYZ consist of 986 internal participants, 131 external participants, and 426 in-house participants. Therefore, it can be concluded that the number of employees attending training is quite high. Currently, training data management is still conducted manually using Microsoft Excel, with training data documents stored separately. Hence, a more structured and integrated information system is needed to ensure that all training records are properly managed and to produce clear results in the information system.

Developing a training information system using Microsoft Access is expected to help PT XYZ address the complexities of their training programs. Additionally, this system ensures the bridging of employee competency gaps while improving the efficiency and effectiveness of the training programs. When it comes to data and information management, Microsoft Access provides useful features to assist users in managing databases (Razaluddin & Evayani, 2019). With the development of this training information system, the company can more easily track employee data, training programs, training schedules, evaluations, and more.

2. Literature Review

2.1 Training Information System

The developed training information system aims to enhance the efficiency of information management at PT XYZ. This system is designed to provide essential information for planning administrative costs, managing supplies, and meeting other needs of the company's leadership. Additionally, the system delivers useful data for organization, supervision, evaluation, and continuous improvement, as well as providing information that supports the company's operational independence.

2.2 Training Management

To work effectively, individuals need skills that align with the company's goals. To enhance training effectiveness, several steps need to be taken, such as conducting a training needs analysis to ensure the training content matches the employees' needs (Widodo, 2021).

2.3 Microsoft Access

Microsoft Access is a database management system designed by Microsoft and offers several advantages that make it a good choice for database management. These advantages include ease of use, customization capabilities, integration with Microsoft Excel, the ability to create small applications, good security features, scalability, and affordability (Gunawan, 2023). According to the guidebook (Amalia Yunia Rahmawati, 2020)), the following are the stages in the database creation process in Microsoft Access:

1) Open the Microsoft Access application.
2) Next, click on the "file" option to open the database window.
3) Then, click on the "new" option. In the new window, you will find several types of databases such as blank database, custom web app, and others. Select the blank database button or another desired type of database.
4) The next step is to design tables, queries, forms, and reports, and enter data.
5) The final step is to click on the "file" option and select "save as."

3. Research Method

The method used in this research is qualitative, focusing on system development. This method consists of several steps, namely:

1) System needs analysis: identification of the basic needs for the training information system includes the types of data required, the existing training processes, and user requirements.
2) System design: design the database structure, including creating tables for training and employee data and defining relationships between tables. Additionally, design data input forms and reports to display the results.
3) System development: system development will involve implementing the design into Microsoft Access, which includes creating the necessary tables and relationships, as well as developing forms and reports according to the established design.

3.1 Informants / Research Subjects

The informants in this research consist of three trainers and two employees: Mr. Ardi leonard, supervisor of people development in the human resources (HR) department, serving as an internal and in-house trainer, Mr. Hendy chalona, supervisor of it functional in the it department, serving as an internal trainer, Mr. Abdizarman, mechanical superintendent in the maintenance department, serving as an internal and in-house trainer; Mr. Hariadi, an employee in the regulatory equipment & fire protection systems department; and Mr. Warso, also an employee in the regulatory equipment & fire protection systems department. The selection of these informants is based on their knowledge and expertise in understanding and managing employee training needs.

3.2 Data Collection Techniques

The data used consists of primary data obtained directly from the company and secondary data from various sources through other media. This research employs several data collection techniques, namely:

1) Observation: this stage involves direct observation of the training data processing using Microsoft Excel at PT XYZ.
2) Interviews: Interviews are conducted with trainers and employees who have participated in training to gain a comprehensive understanding of the needs, challenges, and expectations related to the development of the training information system.
3) Literature review: a literature review is conducted to gather data by examining, reading, and understanding relevant material from various sources such as books and the internet.
4) Questionnaires: respondents provide feedback on the developed information system by filling out questionnaires, which serve as a validation instrument for the system in Microsoft Access.

3.3 Data Analysis Techniques

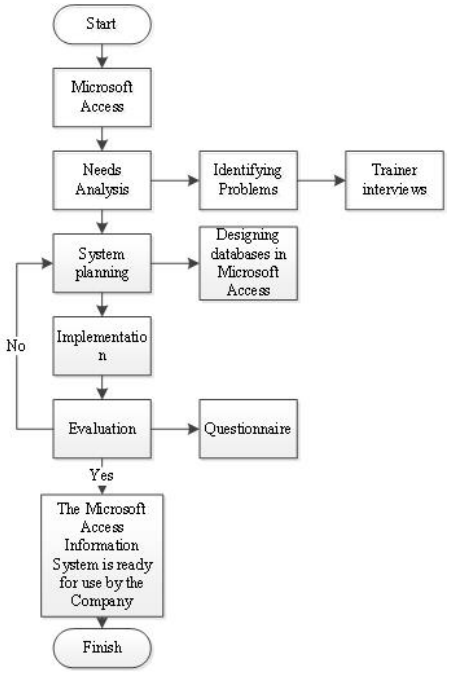


Figure 3.1 research process flowchart

During data analysis, the researcher will transcribe the interviews. Meanwhile, the feasibility of the system is tested using questionnaires as validation instruments in Microsoft Access. The evaluation of the tests is conducted based on criteria using a

likert scale with five response options, where a scale of 1 indicates strong disagreement and a scale of 5 indicates strong agreement. Once the data from the test scale is collected, the next step is to calculate the percentage of respondent responses using the following formula, (Sucipto et al., 2021):

$$Y = \frac{TS}{Ideal\ score} \times 100\%$$

Explanation:

Y:percentage value

Ts:total respondent score= ∑ N.R (rating scale × number of respondents who answered)

Ideal score: maximum weight × number of respondents

Table 3.1 Feasibility Categories

No	category	Percentage
1	Very worthy	81% - 100%
2	Worthy	61% - 80%
3	Decent enough	41% - 60%
4	Not worth it	21% - 40%
5	Not really worth it	0% - 20%

4. Results and Discussion

4.1 System Needs Analysis

Before proceeding with the design process for system development, specifications for hardware and software equipment are required, including:

Table 4.1 Hardware Requirements

No	Hardware Category	Hardware Specifications
1	Monitor	1440 x 900 resolution
2	Processor	intel® Core™ i5-9400 CPU – 2.20 GHz
3	Memory (RAM)	8,00 GB
4	System type	64-bit operating system, x64-based processor
5	Printer	epson L30
6	Photocopier & scanner	HP E 77830dn

Table 4.2 Software Requirements

No	Software Category	Software Specifications
1	Operating system	window 10 Pro
2	Programming language	Microsoft Access

4.2 System Design

Designing this system involves several stages in processing training data. The following is the flow of the training information system design:

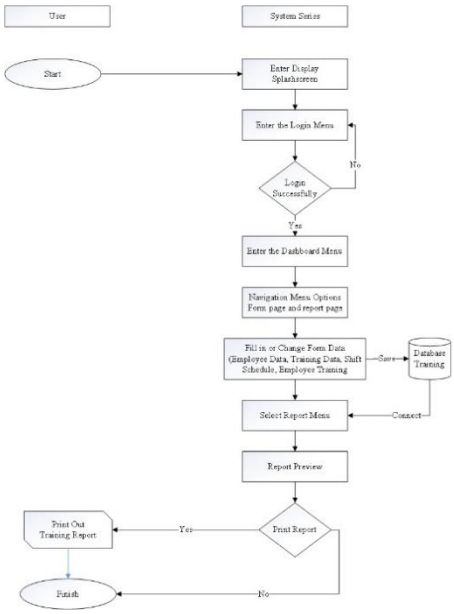


Figure 4.1 system design diagram

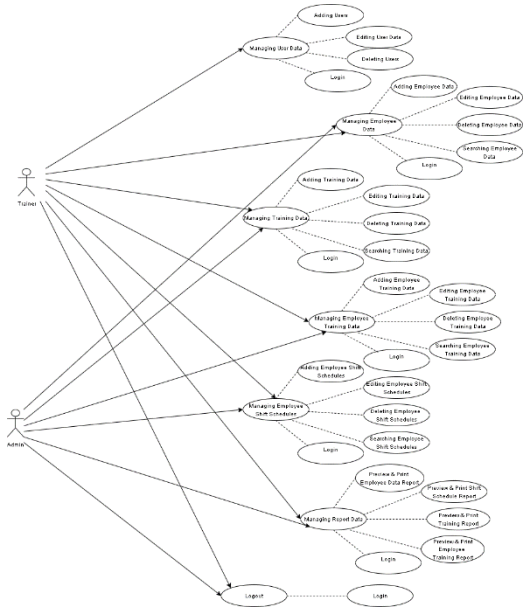
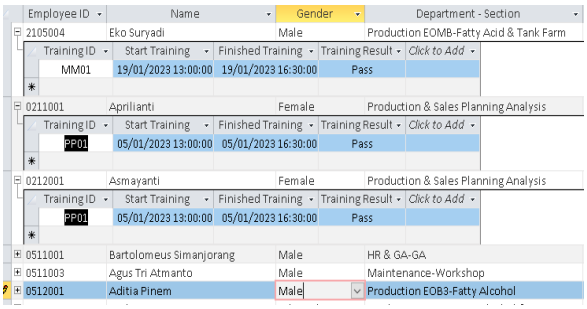


Figure 4.2 use case diagram of the training information system

4.3 System Development

Implementation is the outcome of the previously designed plan. The results of the design are documented in the following implementation table:

4.3.1 Table Implementation



Employee ID	Name	Gender	Department - Section
2105004	Eko Suryadi	Male	Production EOMB-Fatty Acid & Tank Farm
Training ID	Start Training	Finished Training	Training Result	Click to Add
MM01	19/01/2023 13:00:00	19/01/2023 16:30:00	Pass	
0211001	Aprilianti	Female	Production & Sales Planning Analysis
Training ID	Start Training	Finished Training	Training Result	Click to Add
PP01	05/01/2023 13:00:00	05/01/2023 16:30:00	Pass	
0212001	Asmayanti	Female	Production & Sales Planning Analysis
Training ID	Start Training	Finished Training	Training Result	Click to Add
PP01	05/01/2023 13:00:00	05/01/2023 16:30:00	Pass	
0511001	Bartolomeus Simanjorang	Male	HR & GA-GA
0511003	Agus Tri Atmanto	Male	Maintenance-Workshop
0512001	Aditia Pinem	Male	Production EOB3-Fatty Alcohol

Figure 4.1 employee table

4.3.2 Form Implementation

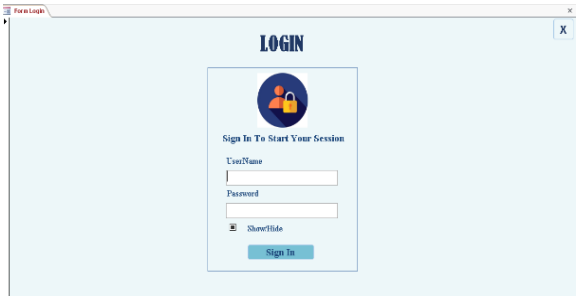
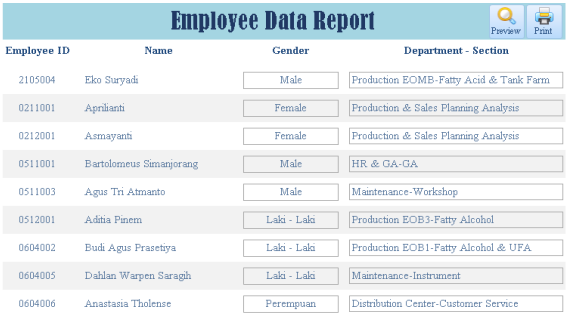


Figure 4.2 result of login form implementation

4.3.3 Report Implementation



Employee Data Report

Employee ID	Name	Gender	Department - Section
2105004	Eko Suryadi	Male	Production EOMB-Fatty Acid & Tank Farm
0211001	Aprilianti	Female	Production & Sales Planning Analysis
0212001	Asmayanti	Female	Production & Sales Planning Analysis
0511001	Bartolomeus Simanjorang	Male	HR & GA-GA
0511003	Agus Tri Atmanto	Male	Maintenance-Workshop
0512001	Aditia Pinem	Laki - Laki	Production EOB3-Fatty Alcohol
0604002	Budi Agus Prasetiya	Laki - Laki	Production EOB1-Fatty Alcohol & UFA
0604005	Dahlan Warpen Saragih	Laki - Laki	Maintenance-Instrument
0604006	Anastasia Tholense	Perempuan	Distribution Center-Customer Service

Figure 4.3 result of employee data report implementation

4.4 Training Information System Testing

System testing is a crucial aspect of application development to check the performance of the database system and make necessary improvements. One commonly used method is functional testing. The following are the test results conducted on the training system:

a. Login Form Testing

Table 4.1 login form test results

No	Action	Expected Result	Test Result
1	Username:trainer01 Password:12345	login successful and navigates to the main menu (dashboard)	pass

b. Switchboard Form Testing

Tabel 4.2 hasil pengujian form switchboard

No	Action	Expected Result	Test Result
1	Click form page menu	navigate to form page, consisting of: employee data input form, training data input form, shift schedule input form, employee training input form	pass
2	Click employee data input form menu	navigate to employee data input form page	pass
3	Click training data input form menu	navigate to training data input form page	pass
4	Click shift schedule input form menu	navigate to shift schedule input form page	pass
5	Click employee training input form menu	navigate to employee training input form page	pass
6	Click report page menu	navigate to report page, consisting of: employee data report, training data report, employee shift schedule report, employee training report	pass
7	Click employee data report menu	navigate to employee data report page	pass
8	Click training data report menu	navigate to training data report page	pass
9	Click employee shift schedule report menu	navigate to employee shift schedule report page	pass
10	Click employee training report menu	navigate to employee training report page	pass

11	Click dashboard menu	successfully return to the e-training eob dashboard menu	pass
12	Click close button	successfully close the e-training eob application	pass

c. Training Form and Report Testing

Table 4.3 training form and report test results

No	Action	Expected Result	Test Result
1	Click previous data icon	navigate to the previous data record	pass
2	Click new data	navigate to the new training data entry page	pass
3	Click save data	data will be automatically saved in the training database	pass
4	Click delete	entered data will be deleted from the training table database	pass
5	Fill in the search field and click the search button	display the code of the searched training data	pass
6	Click next data icon	navigate to the next data record	pass
7	Click print icon	report data is ready to be printed	pass

4.5 System Feasibility Assessment

The system feasibility assessment was conducted twice, on March 28, 2024, for the initial stage, and on April 5, 2024, for the next stage, using questionnaires.

Table 4.4 Training System Feasibility Assessment Results

No	Respondent	Total Score	Ideal Score	Percentage
1	respondent 1	43	50	86%
2	respondent 2	41	50	82%
3	respondent 3	50	50	88%
4	respondent 4	37	50	76%
5	respondent 5	49	50	88%
			Average	**84%**

The assessment was conducted by 5 respondents using a questionnaire consisting of 10 questions. Based on the results obtained, the system received an average percentage score of 86%. With this average percentage score of 86%, it can be concluded that the training information system using Microsoft Access is feasible for use in the relevant department.

4.6 Research Discussion

4.6.1 System Design Process

In this stage, several steps are involved in the design process of the training information system, including:

a. Design planning: during the design phase, a flowchart is created to determine the menus required for creating forms and reports, and a use case diagram is developed.
b. Table design process: at this stage, several tables are created for storing the training database, including: user table, employee table, shift schedule table, training table, and employee training table.
c. Query design process: the design of the training information system's query component involves creating queries to access and manage training data. Queries are used for various operations such as searching employee data, generating training reports, updating participant data, and more. The goal is to ensure that the system can efficiently and accurately retrieve and present the necessary information, supporting effective data management for training.
d. Form design process: the form design process involves creating forms for entering and modifying data input from previously created tables. In the design of the training information system, several forms are created, including: splashscreen form, login form, switchboard menu form, employee data form, shift schedule form, employee data form, employee training form, and user input form.
e. Report design process: the report design process involves displaying summaries of the previously modified training database through forms. In the training information system design, several reports are created, including: employee data report, employee shift schedule report, training report, and employee training report.

4.6.2 Implementation of Design Results

In this stage, the information system developed using Microsoft Access is implemented or executed. After the system is implemented, feedback in the form of comments and suggestions from users of the information system will be collected.

4.6.3 Test Results

According to the testing conducted on the training information system using functional testing methods, several informants assessed the performance of various menu functions, such as the login form, dashboard form menu, form menu, and report menu. The results of the training information system testing indicate that the program is functioning as expected.

After a series of tests and evaluations, the training information system developed using Microsoft Access has been deemed feasible for use. The assessment covered

various important aspects such as ease of use, response speed, reliability, and effectiveness in managing training data. With an average percentage score of 84%, it can be concluded that this training information system meets the expected feasibility standards. The system has demonstrated good performance in various testing aspects and received positive feedback from users. Therefore, the Microsoft Access-based training information system is considered suitable for implementation and is expected to enhance the efficiency and effectiveness of training data management within the company.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the research findings, the development of a training information system using Microsoft Access at PT XYZ has successfully addressed various issues in managing employee training data. This includes planning, tracking, and managing training, as well as ensuring competency gap fulfillment and compliance with applicable regulations. Previously, training data management was performed manually using Microsoft Excel, and training documents were stored separately. The feasibility testing results indicate that the system is suitable for use. A comparison between the existing condition and the condition after implementing the system shows a significant improvement in operational ease, information understanding, and menu display recognition. Thus, the system not only ensures that each employee receives training tailored to their needs but also enhances the effectiveness of training management operations.

5.2 Recommendations

Based on the research findings, both practical and theoretical recommendations are provided:

1) **Practical Recommendations**

   It is important to implement the system gradually across various departments to ensure that all employees understand how to use it. Regular monitoring should be conducted to ensure the system operates smoothly. According to the system feasibility testing, the system achieved an average score of 84%. Based on feedback from informants regarding the system's feasibility, several aspects need attention. Specifically, the menu display should be improved to be more user-friendly and easily recognizable, especially for new users. Although the system is deemed suitable for use, some areas require enhancements to improve usability and understanding for all users.

2) **Theoretical Recommendations**

   This research can serve as a foundation for further development in the field of training information systems. Future considerations may include developing a web-based or mobile application system to enhance accessibility and ease of use.

Additionally, further research on the effectiveness of the system in improving employee competencies and information security is necessary to ensure optimal system performance and security.

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