

## Design of Web-Based Material Management Information System in Financial Module (Case Study PT INTI)

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**Abstract**—PT INTI engaged in telecommunication, has long become a supplier of network construction with a large scale that is national. Therefore, PT INTI has a lot of material and spread all over the city in Indonesia. Previously, PT Inti still uses semi-manual way to do their material recording. The material recording is done by using Microsoft Excel which will be sent by electronic mail (email) if needed. But it is vulnerable to errors because the data contained in is not integrated. To overcome this, PT INTI wants to have a web based application called INTI Maintenance to manage financial materials such as material input, material search, material removal, material search, material data printing, to finance such as request addition, change of request status, delivery, and residual balances of each city. INTI Maintenance web-based information system financial module is built with open source software that uses PHP as the programming language, MySQL as the database, and Windows as server computer. The final results achieved in the material management information system in this module have advantages in assisting PT INTI employees in managing financial data and validation for material delivery using receipt of delivery material.

**Keywords**—information system, management, material, finance.

### I. INTRODUCTION

Web-based information system is familiar in our ears. Website is pages of information system that can be accessed quickly, anywhere and anytime. The use of this information system has become commonplace for various groups such as entrepreneurs, marketing offices, mass media practitioners, companies, schools and universities, even government agencies. Many people use web-based information systems as media marketing, buying and selling, data storage company, or just a media to share detailed information about the agency concerned.

PT Industri Telekomunikasi Indonesia is a State-Owned Enterprise (BUMN) engaged in telecommunication, which has more than 30 years as a major supplier of national telephone network development. Companies that cooperate with PT INTI

include PT Telkom Indonesia Tbk, PT Telekomunikasi Seluler and PT XL Axiata. From the development of convergence trend between telecommunication technology and information technology (IT), PT INTI has changed the business orientation from previously pure manufacture into a system-based industry, especially in the field of infocom systems and technology integration. PT INTI has long been a supplier of network construction and large scale that is national. Therefore, PT INTI sells many materials all over the city in Indonesia. The sale of many materials are feared will be difficult to manage. Previously, PT INTI still uses semi-manual way to record their material, which is using Microsoft Excel and than will be sent by email if needed. However, it is vulnerable to errors because the data contained in them is not integrated. In addition, there are still duplicated data in recording material transactions. This is because the material financial data in PT INTI is not integrated. The process of material financial input is also not accompanied by evidence so risky for PT INTI if there are dishonest employees.

To overcome this, PT INTI requires a web-based information to perform the financial management of the material being sold. It takes a web-based information system because the website uses the internet to be accessible, so that the material financial data contained on the website can be well integrated. In addition, data becomes more accurate and can be accessed in real-time.

Web-based information system called INTI Maintenance in financial module can assist employees in performing financial records. The features of INTI Maintenance are from inputting, changing, deleting, searching, and printing of material request reports, to finances consisting of checking the status of request, changing status, delivery process, balance checking and filling. Material delivery can also be managed properly because every delivery that is being made, there is a required delivery status. After that there is a validation phase that must be passed first before the

delivery process can be completed, so the data becomes accurate. With that features, INTI Maintenance can facilitate employees of PT INTI in recording material transactions both shipping and management and can add the accuracy of financial data delivery and material management.

II. LITERATURE STUDY

II.1. Information System

Information system is a system within the organization that brings daily transaction management needs, support operations, managerial, and strategic of an organization by providing the required reports. The information system consists of components called building block which are input block, model block, output block, technology block, database block and control block. [1]

II.2. Material

Material is where something can be made or something needed to perform an activity. [2]

II.3. Financial Management

Financial management is concerned with planning, directing, monitoring, organizing and controlling a company's financial resources. [3]

II.4. Database

To be able to process good data then we needed database. The goal is to facilitate and speed up the retrieval of data or archives. The most striking of the database is the arrangement, sorting, grouping, organizing the data to be stored according to the function and type. We need to use database because it can be used to solve the problem of data processing by file archiving method and database is very needed in building information system in a company so that by using it can improve performance and competitiveness of the company. [4]

In making INTI Maintenance information system, we used MySQL database. MySQL is a database system that is open source so that it can be used by anyone. This database can store all the required information and provide a fast mechanism for finding information stored whenever the information is needed. [5]

II.5. UML

UML (Unified Modeling Language) is a standard modeling language that is usually a symbol and a diagram to model, visualize, specify, and document an Object-Oriented-based software development system.

UML is not just a symbol or diagram, but it also tells the context of the software. The design of symbol or diagram will later be translated into program code. [6]

II.6. Black Box Testing

Black box testing is a methodology used to examine or test an application from the user's point of view and determine whether the data is processed in accordance with the expected specifications. Focuses on the external behavior of a system and uses functional system specifications to generate test cases. It also ensures that the system does what it's supposed to do and does not do what it should not do. However, the testing methodology is done without knowing the internal structure of the system. [7]

II.7. Iterative & Incremental Method

Iterative incremental method is the result of the development of waterfall method which is a combination of iterative and incremental methods. In this method there will be continuous iteration for each stage in system development and produce an evaluation which is expected to assist in the next stage.

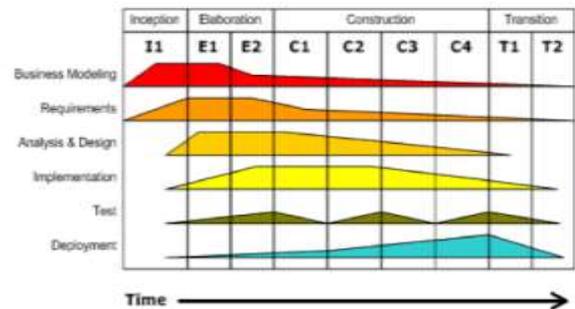


Fig. 1 Iterative & Incremental Method [8]

In Fig. 1 above, iterative incremental cycle is divided into four stages: inception, elaboration, construction and transition. But in each stage, there are stages that must continue to be done that is business modelling, requirements, analysis and design, implementation and testing.

III. METHODOLOGY

In the research, there are planned and systematic steps. In this research, the conceptual model is used which is the concept of thinking by considering the variables and the relationship of one variable relation with another and expected to formulate problem solving and can help solve existing problems. The explanation of the conceptual module is in Fig.2.

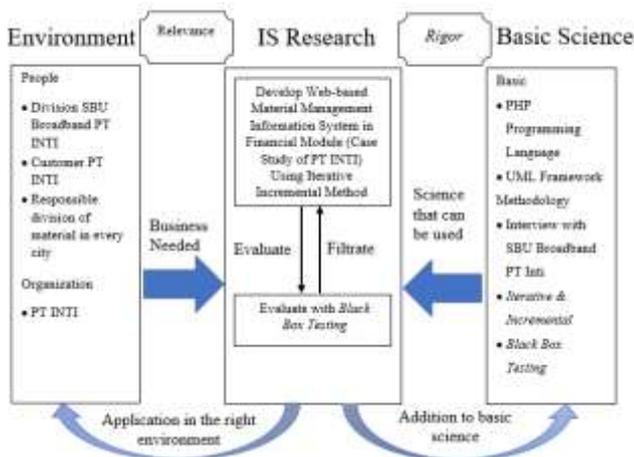


Fig. 2 Conceptual Model

In the research there are also steps that must be done to solve the problem. This section will explain the stages. In outline, systematic research is divided into three stages: identification stage, system development stage, and conclusion and suggestion stage. The systematic research of this research is described as follows.

1. Identification stage

There are two processes at this stage, that is the identification of the problem and the determination of the research objectives. The process of problem identification aims to determine the current problems that occur at PT INTI which then used as a foundation in formulating the problem. The problem that existed in PT INTI is the process of financial recording in material transactions is not effective.

The second process is the determination of research objectives can be done by using literature studies and field studies. By looking at the problems that exist, it needs an information system that can be integrated, accurate and can help PT INTI in achieving company goals. After finding the objective of the research, it is necessary to limit the problem so that research does not get out of line. Limitations of the problem in this research is only discussing about the material financial module in which there is the process of delivery and management of material requests. The information system is web-based and uses PHP programming language, MySQL database, and iterative incremental methods.

2. System development stage

In system development, this research uses iterative and incremental method. In this method there are 4 stages to be done, that is inception, elaboration, construction and transition stage.

3. Conclusion and suggestion stage

At this stage, the design of INTI Maintenance website has been completed and has been evaluated. The test results can be analyzed to generate conclusions and obtain constructive suggestions for the development of this information system.

IV. RESULT & ANALYSIS

4.1. Analysis of Existing Business Process

Business process of financial module focuses on 3 processes: (1) material demand that begins with the submissions of material demand from the customer and has the final output of material delivered, (2) financial management of materials that have inputs submission of financial statement from branch company to head office, and (3) financial management of operational costs that begins an operational cost report that reaches the limit from branch company to head office. The output is head office provides additional operational costs. Stakeholders involved in it are call center, head office, branch company and customers. Existing process of material delivery can be seen in Fig. 3.

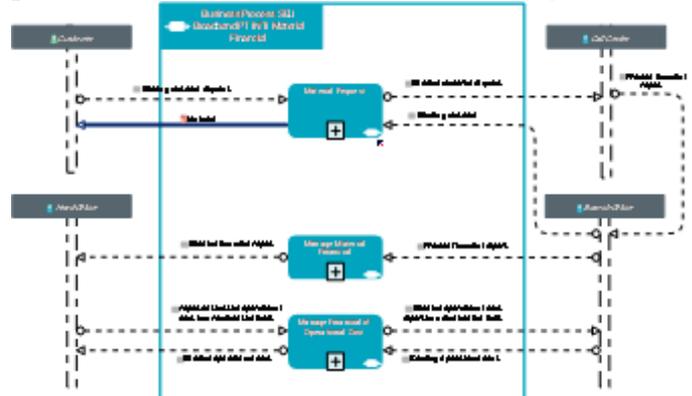


Fig. 3 Existing Business Process

From the existing process, there are several things that require change in order to speed up the company's business processes. This is because there are processes that are not well documented such as the process of delivering materials to customers and the financial records. Existing documentary only uses Microsoft Excel, so the data is not integrated. This causes the data to be less accurate and there are still duplicated data. In addition, the submission of financial data is sent via email so that it is not effective.

The existing delivery process requires an operational cost to deliver the material. Each branch company has its own operational money. If the branch company has been shipping, then the operational money will be reduced in accordance with the shipping cost. But unfortunately, the reduction of money is still done

manually. When the branch company’s operational money has reached the limit, the branch company will contact the head office to re-send the operational money. Seeing from this, it is feared if employees on the branch company cheated in asking for re-send operational money. Therefore, the solution given is the creation of web-based information system that can help the process of shipping material both in the delivery of material and financial management (operational cost) to be more effective.

4.2. Analysis of Recommendation

After analyzing the business processes that are already running, the solution provided is the addition of the use of information systems on the business process flow. The recommendation of information system is a web-based information system called INTI Maintenance. The business process of this recommendation can be seen in Fig. 4.

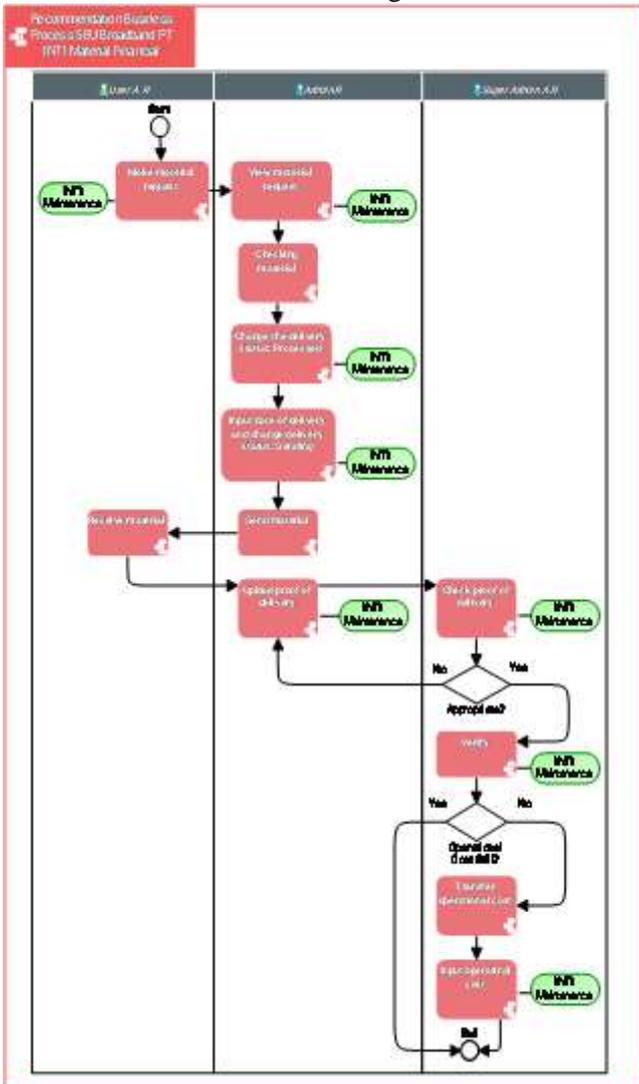


Fig. 4 Recommendation Business Process

4.3. Needs Analysis

Needs analysis explains the requirements needed to develop the information system. The need to be analyzed in this research is the need of actors and functional needs of the system.

a) Actors

There are three actors in this INTI Maintenance website that is super admin, admin and user. Super admin and admin is an internal actor because it is the head office and warehouse that responsible for the delivery of material for each city of PT INTI. While the user is an external actor because it is a customer of PT INTI. The full description of each actor can be seen in the following Table I. Naming actors here are actors who are adapted to the use of the website.

TABLE 1  
ACTOR ANALYSIS

No	Name of Actor	Description
1	Super Admin	An actor who has access specifically in the management of INTI Maintenance website. Super admin can manage overall website such as create, view, update and delete requests and finances. In reality, super admin is the head office of PT INTI located in Bandung.
2	Admin	Actors who have access specifically in the management of INTI Maintenance Website. Admin can only manage website such as editing and viewing request and finance. On the finance menu, admins can only see. In the reality, admin is warehouse that responsible for the material in every city or it can be said branch of PT INTI.
3	External User	Actors who made the material request. Can only see some events only. This actor can not access financial data. In reality, the user is a customer who cooperate with PT INTI.

b) Functional system

After knowing which actors are related in INTI Maintenance website, it is necessary to make a functional requirement analysis of the system. This is done to determine what functions can run on the system. Explanation of the functional requirements of the system can be seen in table II below.

TABLE 2  
FUNCTIONAL ANALYSIS

System Requirement Detail	Description	Actor
Login	Authorization process of account when entered into INTI Maintenance	All actor
Add material request	Material request process from customer	User
View material request	Checking process for all incoming material requests	Admin, Super Admin
Update material request	Process of changing material request data such as status and input date	Admin
Print material request	Process of printing material request data	Admin, Super Admin
Upload proof of delivery	Process of uploading proof that warehouse has sent the material to customer. Being one page with update material request	Admin
Verify proof of delivery	Process of verifying proof of delivery that has been previously uploaded. Associated with the input operational cost used when shipping materials.	Super Admin
Input balance	Perform balance input that have already been transferred	Super Admin
Check balance	Balance will decrease and increase automatically. The balance is reduced when it has been verified and the balance will increase if it has to add operational cost	Admin, Super Admin

4.4. User Design Analysis

To perform the user design analysis, a diagram will be drawn up that describes the actors involved in accordance with the recommendation business process and what permissions these actors can perform.

To perform the user design analysis, a diagram will be drawn up that describes the actors involved in accordance with the proposed business process and what permissions these actors can perform.

In use case diagram it has 3 actors involved ie user, admin and super admin. Users have two activities: making material request and managing material request. However for material request management, the user can only make changes and removal requests when the material delivery status is "submitted". Admin is responsible for managing material delivery, can print request data, view balance and print balance data. In material requests management, admin can view and update on material requests. Super Admin is responsible for managing material delivery, can print

request data, view balance, print balance data and perform balance management that is input account balances. Any activity undertaken by these actors must go through the Login process first. The depiction of the use case diagram can be seen in Fig. 5.

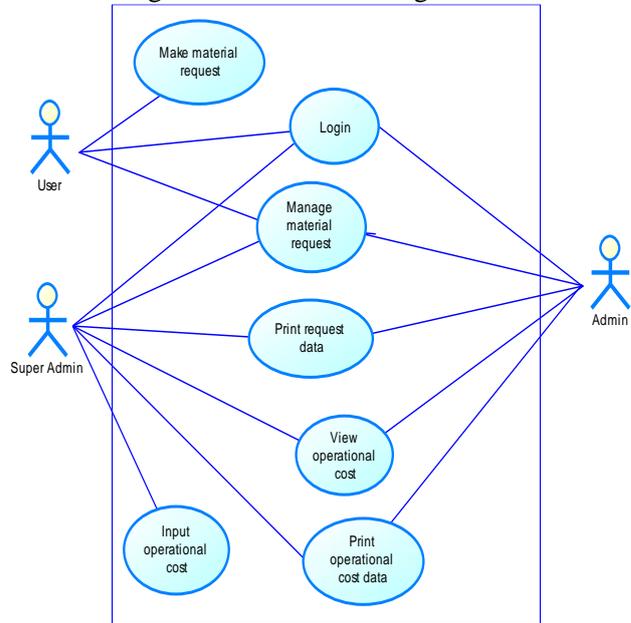


Fig. 5 Use Case Diagram

4.5. Design of Information System

The design of information systems INTI Maintenance financial module is done to facilitate the process of managing material and financial requests. With INTI Maintenance, users can easily submit material requests, admins can easily deliver material with additional features that can clarify data delivery material and superadmin can easily perform the financial management in the form of balance or operational cost. Previously, material requests by users have been through the website but there are still functions that do not work properly. Material delivery is also not linked to the website so the data is not real-time. The documentation of financial management is also not clear, so there is a risk of fraud.

The flow from INTI Maintenance module starts from the user who requests material on the Request menu. Users must login first to enter the menu. After making a material request, the material delivery status becomes "submitted" automatically. If the status has not been changed by the admin to be processed, then the material request can be changed or deleted. If it has changed, then the request can not be changed and deleted. Next, the admin will change the delivery status and make delivery of the materials. The delivery status consists of being submitted, processed, sending and completed. When admin change the sending status to "sending" then also need to input date of delivery. After

the material reaches the user, admins need to upload proof of delivery which will be related to the balance they have. Super admin is responsible for verifying proof of delivery. Before do the verification, super admin will first check the conformity of proof of delivery that has been previously uploaded. If it is appropriate then super admin will input balance of shipping costs that have been used by the admin and the balance of the admin will be reduced automatically. When the admin balance has reached the limit, then the super admin will get a notification to add the admin balance again.

The design of the database in this research was conducted using MySQL. The tables in the database are designed in accordance with the needs and performed normalization. Each table has a primary key and a foreign key. Its function is to prevent duplicated data.

The design of User Interface (UI) is adjusted to the requirements that already given. In the financial module, the page created is the user request page, admin and superadmin that includes CRUD (Create, Read, Update, Delete). But not all actors can do CRUD. It is adjusted to the level of each actor separated by the session in the creation of this website. In addition there is a special financial page containing the balance and transfer pages. On the transfer page there is an option to add a new transfer. Actors who can access the financial pages are only admin and super admin. The results of some UI designs that have been made can be seen in Figure 6 to Figure 12 below.



Fig. 8 View Request



Fig. 9 Add Request



Fig. 6 Homepage



Fig. 10 Edit Request



Fig. 7 Login



Fig. 11 View Balance



Fig. 12 Add Balance History



Fig. 13 Input Balance



Fig. 14 Print Data

## V. CONCLUSION

The business process of financial module focuses on 3 processes: material demand, financial management of materials and financial management of operational costs. Previously, any of processes that described above have not been well documented. This can be seen from the lack of computer-based on existing path. In addition, there are still duplicated data in practice. The development of INTI Maintenance website becomes a recommendation that can help business process running on PT INTI. On the website that has been created, there are new features that can be used such as inputting, changing, removing, searching, and printing material request data, there are also financial features such as viewing the remaining balance and adding the balance. All of balance data can be printed. With the existence of INTI Maintenance, can facilitate the employees of PT INTI in recording material transactions both shipping and management, and adding accuracy of financial delivery data and material management.

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