

Design of Vehicle Asset Management Information System (Case Study: STMIK STIKOM Bali)

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Abstract— Vehicle is a transportation asset that many owned by agencies or companies as one of the media operational. Determined operators manage vehicle assets in an agency that becomes a factor of management to be less effective and efficient. In addition, the process is still running conventionally. In the existing business process in STMIK STIKOM Bali is divided into three processes that include the process of borrowing vehicles, operational process, vehicle maintenance process. In this paper we discuss the design of vehicle asset management information system on STMIK STIKOM Bali. The design of this proposed system will be web based using PIECES analysis. Vehicle tracking and reminder system on vehicle asset management becomes one of the features in this system design. For system development using System Development Life Cycle method. This system is expected to facilitate various difficulties either experienced operator or applicant. In addition, this system is expected to reduce the problems regarding the management of vehicle assets.

Index Terms— Management Information System, Vehicle, Asset, System

I. INTRODUCTION

Each agency or company has different many managements. One of them is about management of vehicle asset management. In vehicle asset management there are many business processes in it. In STMIK STIKOM Bali existing processes on vehicle asset management include vehicle lending management, vehicle operational management and maintenance management or vehicle maintenance. In the management of vehicle borrowing on STMIK STIKOM Bali Applicant or borrower must go to room Facilities and Infrastructure to inquire information about the availability of vehicles to the Operator. The availability of the vehicle is checked on the chalkboard as its operational recording media. In addition to the process of borrowing the vehicle must fill the vehicle loan letter. If the vehicle to be borrowed is available, the letter must be verified by several divisions / other sections covering the Head of Infrastructure Facility, Head of Institution, Assistant Chairman II and Chairman STMIK STIKOM Bali. If this has been fulfilled, the Operator shall confirm that the loan has been approved to the Applicant. Same thing with the management of maintenance or maintenance of the vehicle, In this process if there is an improvement on a vehicle the chairman of the institution must submit a letter repair tool

that can be obtained in the Infrastructure Facility. The letter is filled by the chairman of the institution about the tool to be repaired. The operator checks the tool you want to repair based on the proposed letter. if necessary repair is required, the Operator will forward the letter for verification by the Head of the facilities and infrastructure and the Chief Assistant 2. If it is approved then the Operator will repair the tool. The process of maintenance or maintenance of routine maintenance such as routine service, extension of letters - letters are still based on the awareness of the person in charge of the Vehicle. All the processes that take place on the STMIK STIKOM Bali is still conventional. With business processes that are still done conventionally, it is necessary to design an information system of vehicle asset management effective and efficient. On this occasion we made research on the design of Vehicle Asset Management Information System.

II. LITERATUR REVIEW

A. Information System

The information system is a combination of several components between people, information technology, procedures and data to support business processes so that the resulting information.[1]

B. Information System Designer

Definition of design according to Jogiyanto the design is the stage after the analysis of the system development cycle which can be a description, planning and making a sketch or arrangement of several separate elements into a unified whole and functioning, software and hardware components of a system. According Jogiyanto "System is a network of interconnected, gathered together to perform an activity or to complete a certain target" [2].

According to O'brian in Jacob that "Information system is an organized combination of people, hardware, software, communications networks, and data resources that collect, change, and disseminate information within an organization " [3].

According Mulyanto "information system as a component consisting of human, information technology, and work procedures that process, store, analyze, and disseminate information to achieve a goal. Researchers conclude that the information system is a combination of

several components of both software components and hardware that work together in collecting, processing, and disseminate data for a particular purpose [4].

C. Management Information System

SIM (Management Information System) is the application of information systems within the organization to support the information - information required by all levels of management. The SIM is on the system, not on the management, but for the SIM can take place effectively and efficiently, The information system in its phasing can be described as a pyramid structure, with the bottom layer covering information for the transaction process, status checks, and so on. The next stage includes information resources to support tactical planning and decision-making for supervision and the peak stage includes information resources to support planning and decision-making by higher management [5].

D. Asset Management

According to Ouertani et al., (2008), asset management is the process of organizing, planning and supervising the purchase, use, maintenance, repair and / or elimination of physical assets to optimize service delivery potential and minimize risk or cost associated with the life of the asset using intangible assets such as knowledge-based decision applications and business processes. In asset management, the life cycle of an asset can be formulated into five main phases: 1. Acquire, 2. Deploy, 3. Operate, 4. Maintain, and 5. Retire [6].

E. Flowchart

According Hartono (2001: 795) flow chart (flowchart) is a diagram (chart) that shows the flow (flow) in the system or system procedures logically. Flow charts are used primarily for communication aids and for documentation [7].

F. Context Diagram

The CD (Context Diagram) shows the system as a whole, all external entities must be described in such a way that the data flowing in the input-output inputs. CD uses three symbols: symbols to symbolize the external entity symbol to symbolize data flow and symbol to symbolize process. CD should only consist of one process only, can not be more, and on CD not depicted store data. Process on CD is usually not given number [8].

G. Data Flow Diagram

Data Flow Diagram (DFD) is also called the Data Flow Diagram (DAD). DFD is: a logical data model or process created to illustrate: where the data originates, and where the data destination exits the system, where data is stored, what processes produce the data, and the interaction between stored data, and processes imposed on the data [9].

H. Conceptual database design

Conceptual database design is the process of building a model based on information used by a company or organization, regardless of physical planning and

independent of all physical considerations. The conceptual database design stage begins by creating a conceptual data model of the firm with implementation details such as DBMS targets, application programs, programming languages, hardware, platforms, performance and all other physical considerations [10].

III. RESEARCH METHODS

A. PIECES Method.

Pieces Analysis Method according to Al fatta [11] method using six variable PIECES, as follows:

1) Performance (Performance Analysis)

Performance problems occur when the business tasks that run do not reach the target. Performance is measured by the amount of production and response time. The amount of production is the number of jobs that can be completed over a period of time. In the marketing section, performance is measured by volume of work. The market share achieved, or the image of the company. The response time is the average delay between a transaction and the response given to the transaction.

2) Information (Information Analysis)

Information is a crucial commodity for end users. Evaluation of the ability of information systems in generating useful information needs to be done to address opportunities and deal with emerging problems. In this case improve the quality of information not by increasing the amount of information, because too much information will actually cause new problems. Situations requiring increased information include. Lack of information on current decisions or circumstances, Lack of relevant information about current decisions or circumstances., Lack of timely information, Too much information, Inaccurate information, Information can also be the focus of a constraint or Policy. While the information analysis checks the system output, the analysis is stored in a system.

3) Economic (Economic Analysis)

Economic reasons are perhaps the most common motivation for a project. The foothold for most managers is the cost or the rupiah. Economic issues and opportunities related to cost issues. As for the things to note can be listened to the following:

- Cost
- Advantages

4) Control (Control Analysis / Security)

Business tasks need to be monitored and corrected if substandard performance is found. Controls are installed to improve system performance, prevent, or detect system errors, ensure data security, and requirements. The things to note are:

- Weak security or control
- Control or excessive security

5) Efficiency (Efficiency Analysis)

Efficiency involves generating as much output as possible with the smallest possible input. Here is an indication that a system can be said to be inefficient:

Much time is wasted on human resource activities, machines, or computers.

- Data is inserted or copied in excess.
- Data is processed redundantly.
- Information is generated excessively.
- The effort required for tasks is too much.
- The material required for tasks is too much.

6) Services (Analysis Services)

Here is the judgment criteria where the quality of a system can be said to be bad: a. The system produces inaccurate products.

- The system produces inconsistent products.
- The system produces an untrusted product.
- The system is not easy to learn.
- The system is not easy to use.
- The system is awkward to use.
- The system is inflexible.

Based on the above description, system analysis is performed to produce a written report that is used to identify problems of a system applied to get a picture of the state of the system being applied. This, to solve the problems that occur and as a reference for leaders in decision-making

B. System Development Life Cycle (SDLC)

In the development of waterfall method has several sequential stages are: requirements (needs analysis), design system (system design), Coding (coding) & Testing (testing), Application Program, maintenance. The stages of the waterfall method are as follows:

1) Requirement Analysis

This stage of system developers required communication aimed at understanding the software expected by the user and the limitation of the software. This information can usually be obtained through interviews, discussions or direct surveys. Information is analyzed to get the data required by the user.

2) System Design

The requirements specifications of the previous stage will be studied in this phase and the system design is prepared. System design helps in determining hardware (hardware) and system requirements and also helps in defining the overall system architecture.

3) Implementation

At this stage, the system was first developed in a small program called a unit, integrated in the next stage. Each unit is developed and tested for functionality called unit testing.

4) Integration & Testing

All units developed in the implementation phase are integrated into the system after the tests performed by each unit. After integration the whole system is tested to check for any failures or errors.

5) Operation & Maintenance

The final stage in the waterfall model. The finished software, run and done maintenance. Maintenance includes

fixing errors not found in the previous step. Improved implementation of system units and improvement of system services as new needs.[12]

IV. DISCUSSION AND RESULT

The design of the proposed system can be seen in the design of Tools and System Design, In the design of this system is made in the form of Context Diagram, Data Flow Diagram (DFD), Conceptual database and system interface design and Flowchart.

A. Context Diagram

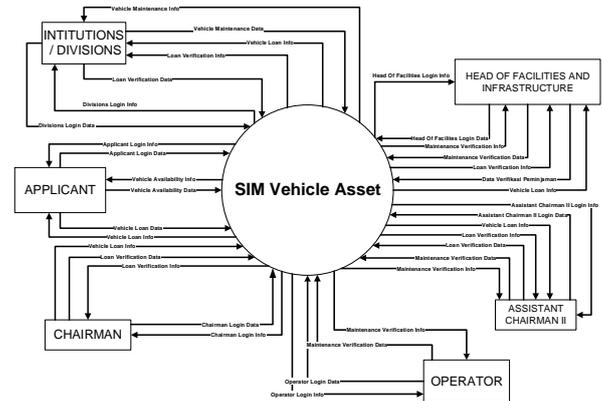


Fig. 1. Context Diagram

In Context Diagram Explained the design of vehicle asset system has 6 entities involved which include Applicant, Operator, Head of Facilities and Infrastructure, Institution / Division Assistant Chairman II and Chairman STMIK STIKOM Bali. In the picture described the applicant can check the availability of vehicles online by accessing the vehicle asset management information system. The applicant may also borrow online through the system. In addition, the applicant can know about the status of borrowing is done without the need in real time. At the moment the applicant makes the vehicle loan in the system. Automatically the system will send loan verification email to the Head of infrastructure, Head of Institute, Assistant Chair 2 and Chairman. This email verification system aims to mobility the involved entities can make verification easier.

In the design of this proposed system on the vehicle maintenance process in STMIK STIKOM Bali is limited which includes the maintenance of damage to vehicle tools and repair of routine tools that have a period of maturity. This maintenance process is done by the Institution / Division who want to make improvements to the tool. The proposed repair tool is checked by the operator to ensure that the equipment needs to be repaired. The operator performs maintenance verification if indeed the tool is needed repair. The System Automatically sends a verification email to the Chief of Infrastructure Facilities and Assistant Chief 2. If All has verified the operator will perform the repair tool. In the previous System the process is still done conventionally.

B. Data Flow Diagram

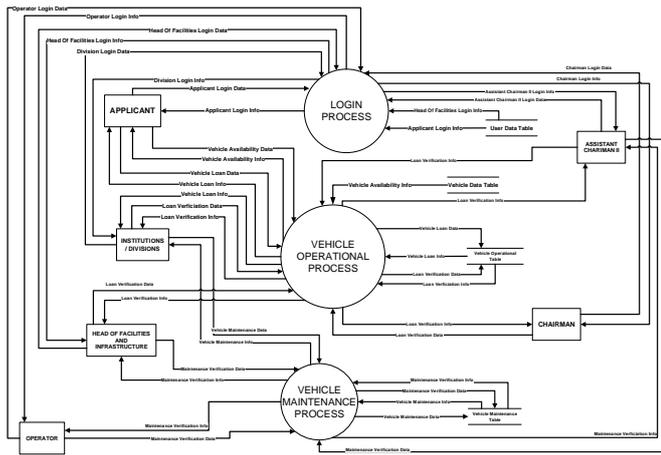


Fig. 2. Data Flow Diagram

In Data Flow Diagram above described the design of transportation management information system broken down into 3 processes, namely login process, vehicle operational process and vehicle maintenance process. The process has been described in the Context Diagram. In the Data Flow Diagram is also the design of this Vehicle asset information system using 4 Data Store which includes a User Data Table functions to accommodate data - data users who can access this system. Vehicle data table that serves to accommodate vehicle assets owned on STMIK STIKOM Bali. Vehicle Operational Table that functions to accommodate vehicle borrowing data conducted by the Petitioner. And for the Vehicle Data Maintenance Table is a place to accommodate the maintenance data submitted by the institution / Division.

C. Conceptual Database

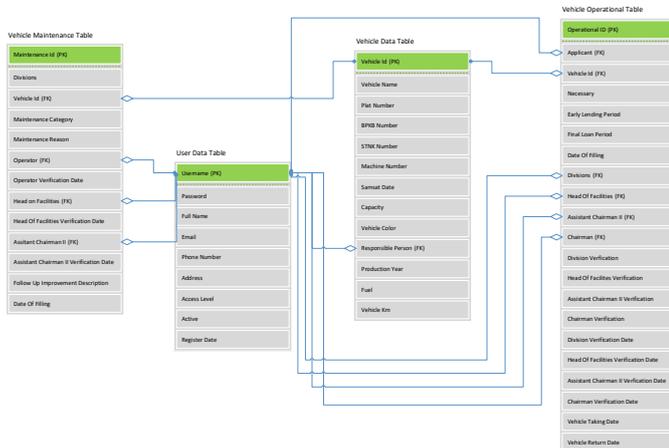


Fig. 3. Conceptual Database of Vehicle Asset Management Information System.

In Figure 4 explained more details about the 4 Data Stores in the Data Flow Diagram. in the user data table there are several attributes including username, password, full name, email, mobile phone number, address, access level, active status and Register date.

In the vehicle data table there are several attributes that include vehicle id, vehicle name, plate number, bpkb number, stnk number, machine number, samsat date, vehicle capacity, vehicle color, vehicle responsible, production year, fuel, vehicle km.

In the operational table of the vehicle there are attributes that include the operational id, the applicant, the vehicle, the need, early loan period, final loan period, the filing date, divisions verification, head of facilities verification, assistant chairman II verification, Chairman Verification, the date of return of the vehicle along with the date of verification of each section.

In the Vehicle Maintenance Table there are attributes of maintenance id, verification of head of institution, vehicle, maintenance category, maintenance reason, operator, operator verification, head of facilities Verification, Assistant Chairman II, follow up improvement Description, filing date and verification date respectively part.

D. Flowchart

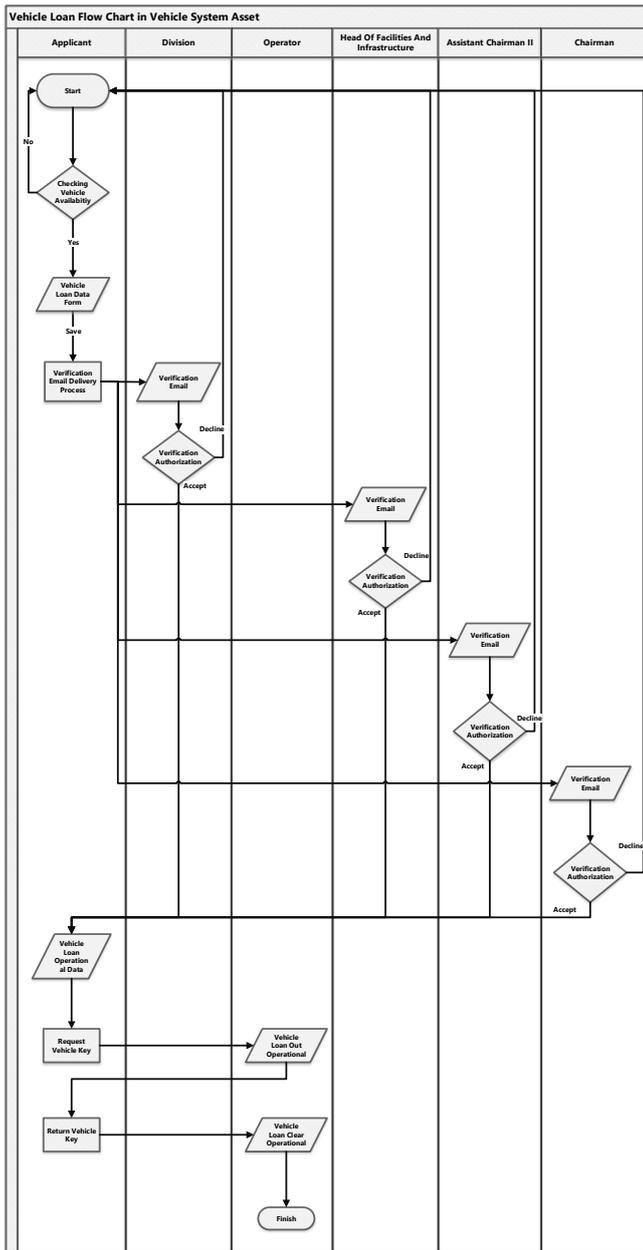


Fig. 4. Operational Vehicle Loan Flowchart

Figure 4 explained the operational process of vehicle lending business in the system. At the design flow of this system ranging from checking the availability of vehicles. If the proposed vehicle of the applicant is available then the system will send a verification email automatically to the division section, the head of the facilities and infrastructure, assistant chairman II and the chairman. If All sections have approved the verification email then the vehicle loan has been approved and is ready for operational. Applicant can take the vehicle lock on the Operator if already approved and operator will change the vehicle loan status to out. If the Applicant has finished using the vehicle, the applicant

returns the vehicle key to the operator. the operator will change the status that the vehicle loan has cleared.

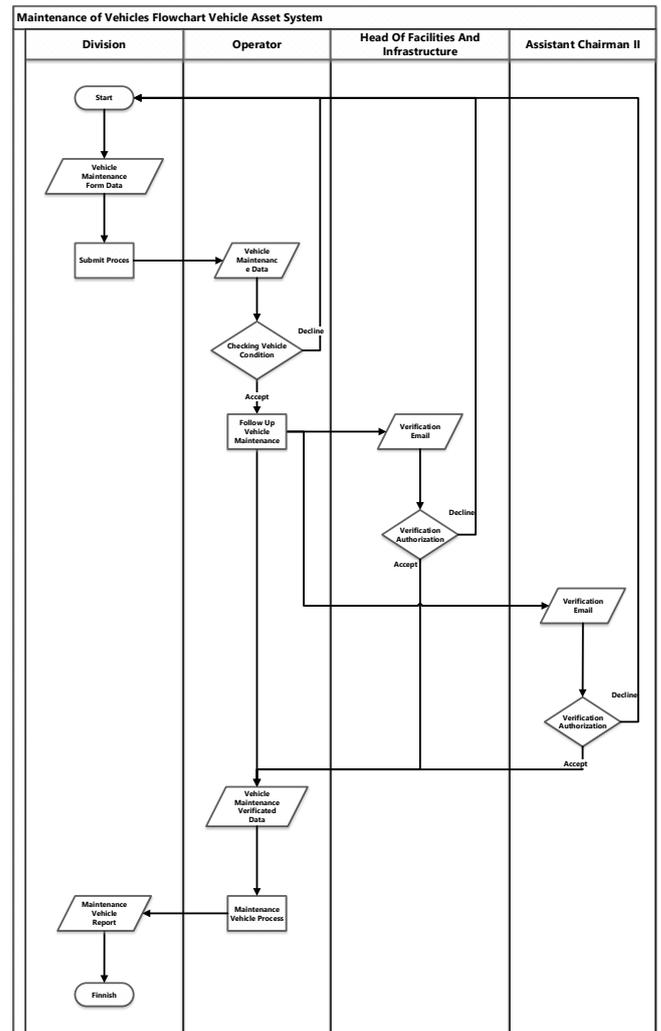


Fig. 5. Operational Vehicle Maintenance Flowchart

In Figure 5 Explained Division Section Filed Vehicle maintenance by filling the form system. The operator will check the maintenance of the proposed vehicle. If maintenance is to be performed the Operator will approve the submission. The system will send an verification email to the head of the facilities and infrastructure and the assistant chairman II. The operator will take further action on vehicle maintenance and report to the division.

E. Interface Design

Interface design is a design view of the system as a form or picture of the system you want designed. The following interface design on the design of Vehicle Asset Information system on STMIK STIKOM Bali.

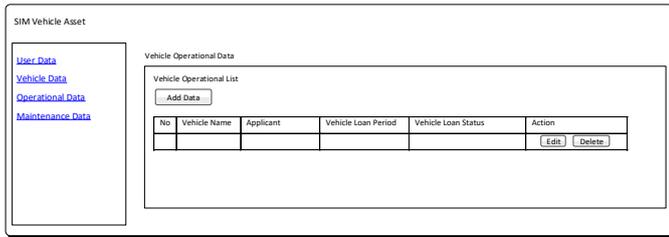


Fig. 6. Vehicle Operational Interface Design

Figure 6 is an overall view of the operation that will take place or has already taken place on the system.

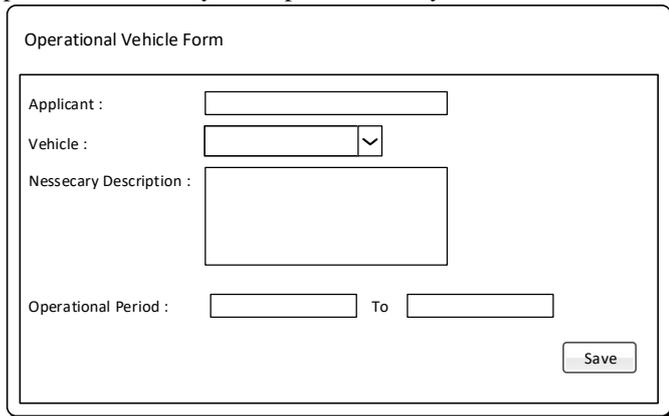


Fig. 7. Interface Design of Vehicle Operational Form

Figure 7 is a design display form submission of vehicle loan. on this form the user must fill in some columns that include the name of the applicant, vehicle selection, the period start to finish as well as description.

V. CONCLUSION

From the expected Discussion and Expected Results then we conclude the vehicle asset management information system is expected to facilitate various difficulties either experienced operators or applicants. The system can have good documentation at every stage The transportation management information system is expected to reduce the problem of vehicle asset management.

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