Operational Vehicle Information System (Case Study: PT Electronic Data Interchange Indonesia)

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Abstract:

Nowadays, technological growth is one of the driving forces for all companies competing to update the work system more efficiently and easily. PT Electronic Data Interchange Indonesia (PT. EDII) is a company engaged in IT consulting services with clients and several other company partners. This has required some PT. EDII employees to work on-site at client offices or other company partners. Therefore, vehicle management is necessary to support employee activities in carrying out official trips outside the office. In carrying out their business processes, the head of the pool, employees, and drivers face problems in terms of vehicle management, namely the inconvenient process of ordering vehicles via email. This creates a driver plotting error because it only coordinates via email and there is no trip log. Therefore, a vehicle management information system and vehicle maintenance management are an effective solution. The web-based application will be designed using a prototype system development method, with the CodeIgniter (CI) framework, and MySQL as the database server.

Keywords — **Vehicle, Prototype Method, Vehicle Management.**

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I. INTRODUCTION

The role of current technological Developments is very important in all aspects of works, especially in the business development of an organization or company. Today's business development cannot be separated from the important role of Technology and information Systems. Advances in computer and information technology have a considerable influence on the performance of data processing and information presentation in an organization or company. Information system is one of the ways to improve data processing performance so that the processed data will provide accurate information.

PT Electronic Data Interchange Indonesia (hereinafter referred to as PT. EDII) is a company engaged in IT Consulting Services, which has clients and several other company partners. Therefore, some PT EDII employees must work on site at client offices or other company partners. This matter is very dependent on the use of operational vehicles to support employee activities in traveling outside the office.

Currently, ordering operational vehicles at PT EDII itself has been done via email, but there are still many shortcomings and problems. One of the problems is plotting vehicles and tracking drivers. This has a drawback, namely, the large number of

requests for vehicle bookings makes it difficult for the pool head to coordinate via email. Furthermore, there is no notification of an approval or rejection order after employees place an order for an office operational vehicle. This is the cause of driver sharing errors, where sometimes a driver can receive two trips in the same hour due to logging errors. In addition to that, the unavailability of a system to manage vehicle maintenance. Vehicle maintenance becomes crucial when it comes to operational vehicles in a company. Therefore, a system is indispensable to manage operational vehicles at PT EDII.

Based on the description above, a web-based application is needed to manage vehicle order information, vehicle plotting, vehicle maintenance reports and approval of vehicle maintenance bills which will facilitate the management of operational vehicles at PT EDII. Therefore, the authors are interested in conducting research with the title "Operational Vehicle Information System at PT Electronic Data Interchange Indonesia".

II. RESEARCH METHOD

Data collection techniques used in this research process are:

1. Interview

Interviews are conducted with one of employees of the vehicle operations division and the head of the PT EDII vehicle pool.

2. Literature Study

Data collecting by reading, searching, processing the contents of several references of scientific works, books, and journals that can be used as references in the process of making the system development.

3. Documentation

This technique is used to collect documents related to operational vehicle management system problems.

III. DESIGN ANALYS

The following is an overview of the ongoing business processes at PT. EDII Indonesia:

A. *Analysis of Current Process*

- Description of the vehicle reservation procedure

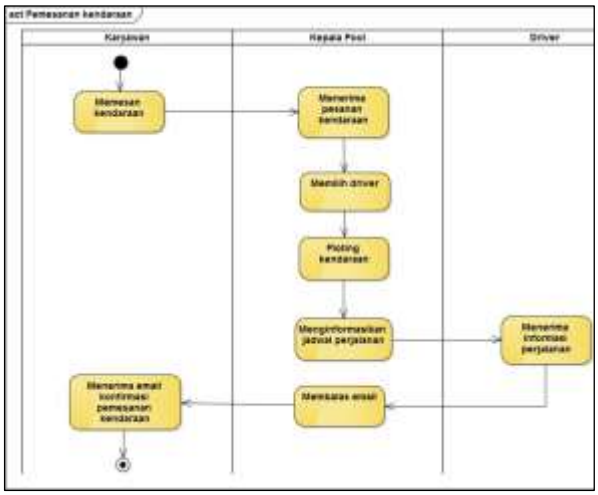

Figure 1 vehicle reservation procedure

- Description of vehicle service procedures

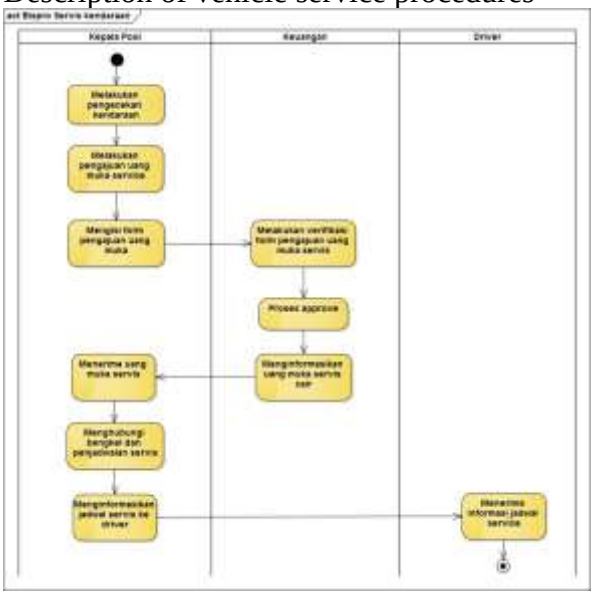

Figure 2 vehicle service procedurs

- Description of bank disbursement form procedures

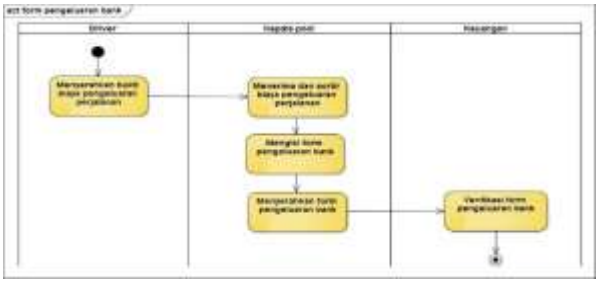

Figure 3 bank disbursement form procedurs

- Description of the procedure for liability for vehicle service down payments

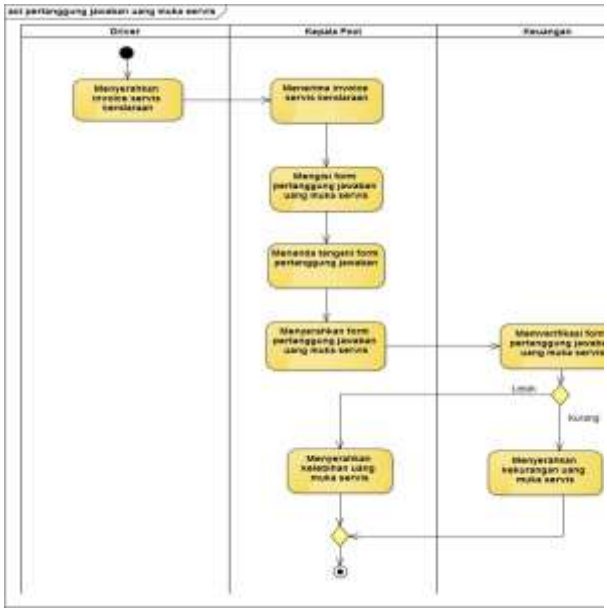

Figure 4 the procedure for liability for vehicle service down

B. *Problem Analysis*

To be able to formulate the problem, the writer identifies the running process which is then detailed by the Fishbone method as causal data that occurs. The following are the results of the existing system analysis:

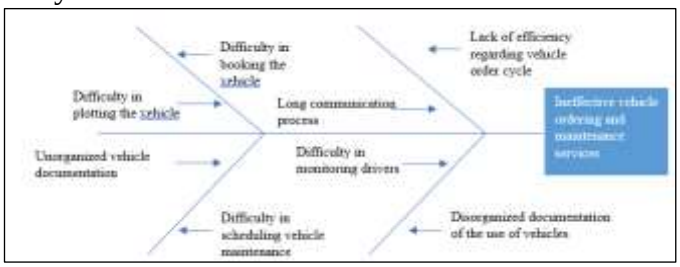

Figure 5 Fishbone analysis

Based on the explanation of the problem analysis depicted through the fishbone diagram above, the following is a needs analysis that includes the causes and solutions to each existing problem.

Table 1 explaon of the problem analysis

No.	Aspect	Problem	Cause	Solution
1.	Technical	Difficulty in booking the vehicle	Vehicle reservations are currently via email. This makes it difficult when the head of the pool receives vehicle orders because there is no separate system for managing vehicle orders	a vehicle ordering system that will optimize the vehicle ordering process is created.
		Difficulty in plotting the vehicle	The unavailability of a system for recording which vehicles are being used and not used. So, the head of the pool must check directly to see the availability of vehicles.	A floating menu of vehicles and drivers is provided to make it easier for the pool head to see the availability of vehicles.
2.	Communication	Lack of efficiency regarding vehicle order cycle	The previous process does not support systematic management of the vehicle order cycle	a menu that supports efficiency and effectiveness for management of vehicle order cycle is created
		Long communication process	All divisions in checking and updating vehicle orders are carried out using various different platforms, resulting in no system	A system with various modules is created that organizing and integrating work between divisions on one platform to support an

			integration and communication between divisions.	effective and efficient communication process.
3.	People	Difficulty in routine and periodic maintenance of operational vehicles	There is no system for vehicle maintenance management, so that vehicle service becomes unstructured	A system is created with various modules, one of which is the vehicle service module so that the recording of vehicle services becomes routine and systematic
		Unorganized vehicle documentation	This is due to the work process that is required to be fast without a place to store documents neatly and systematically, especially vehicle data	a vehicle report menu is created, as a master database for organizing vehicle usage documents and vehicle servicing
4.	Procedure	Difficulty in monitoring drivers	There is no process to determine the availability of drivers, making it difficult for the pool head to plot drivers	A driver monitoring module is created using the tracking feature, so that the pool head knows the availability of drivers
		Disorganized documentation of the use of vehicles	There is no module for reports as a place to store documents neatly and systematically	A vehicle usage report module and travel notes are made so that the documentation becomes more organized and systematic

In the analysis of system development plans, the authors use Unified Modelling Language (UML). The diagrams that will be designed are Use Case Diagram, Activity Diagram, Sequence Diagram, and Class Diagram. Here is a proposed plan in the form of UML which is described below.

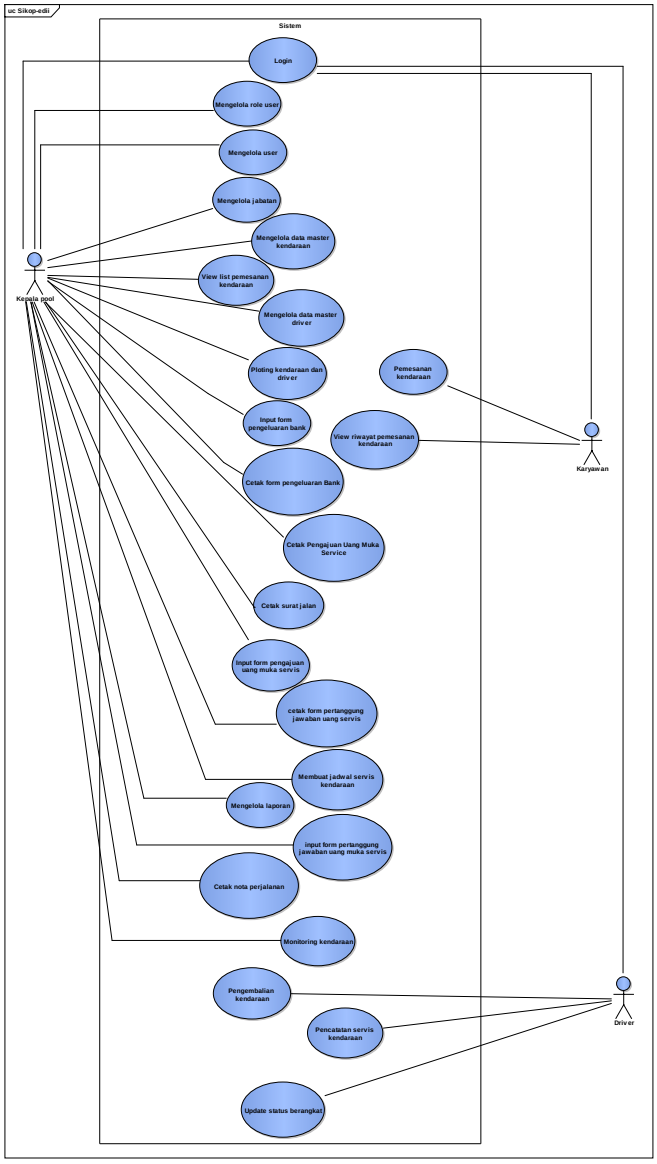

Figure 6 Use Case Diagram

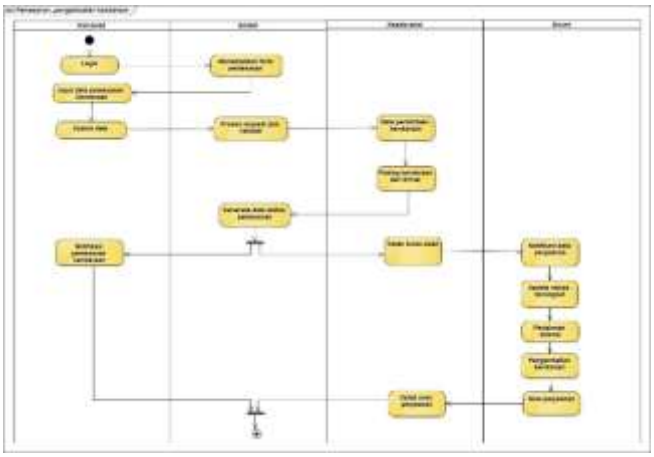

Figure 7 Vehicle reservations

Vehicle reservations submission by employees of PT EDII is by completing the travel details data. If the data is complete, the pool head see the reservation dashboard for the list of trips that have been ordered by employees, then plot the vehicles and drivers. Then, the head of the pool can print the pass and the driver travels. When the trip is complete, the driver fills out the vehicle return form by including the total cost of the trip which produces a travel note.

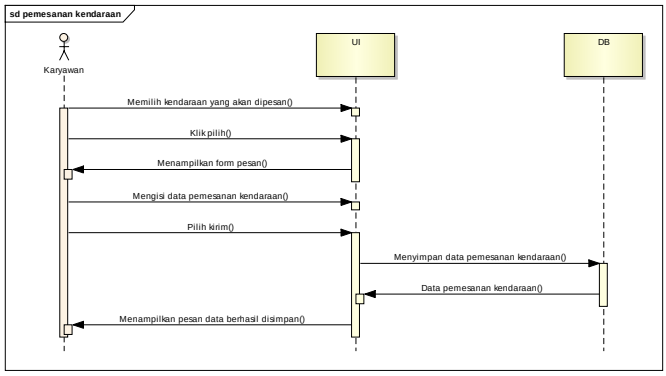

Figure 8 Sequence Diagram Vehicle reservations

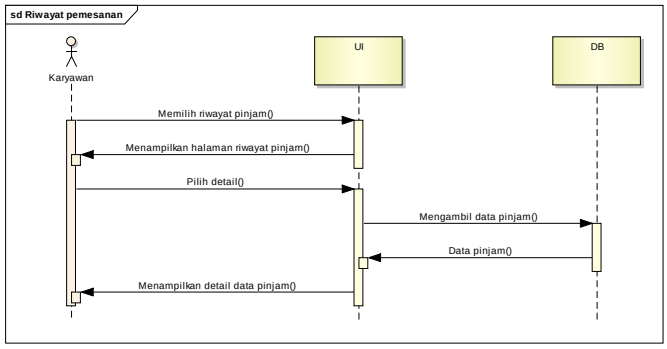

Figure 9 Sequence Diagram Summary reservations

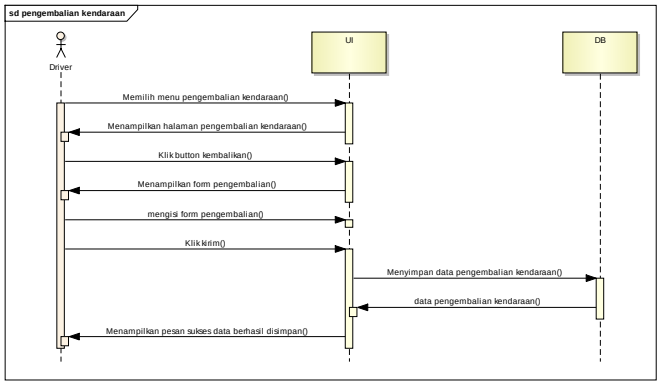

Figure 10 Sequence Diagram vehicle back

In the sequence diagram above, it explains the admin activities managing tenants, namely adding, editing, and printing owner data reports on the

system. Admin enters the tenant management page, then the admin enters the tenant's data in the add tenant form. If successful the system will send a message the data has been saved successfully. When the admin edits the data on the tenant data edit form, if successful the system will send a message the data has been successfully changed. And when the admin chooses print, the data will be printed according to the data input query that the admin wants.

Class diagram is a diagram explain or visualize the structure of the class system to be linked. The following is Class diagrams used in this application

Figure 11 Class Diagram

1. Table mst_transaksi

No.	Field Name	Type of data	Length	Remarks
1	Id_transaksi	Int	11	Primary Key, autoincrement
2	Jenis_kegiatan	Varchar	40	Withdrawal for activities/needs
3	Id_proyek	Int	11	Project name
4	Nama_pemohon	Varchar	15	Name of applicant
5	Jenis_form	Varchar	25	Type of form used
6	Id_approval	Int	11	Approval atasan
TOTAL			64	

2. Table id_dtl_transaksi

No.	Field Name	Type of Data	Length	Remarks
1	Id_dtl_transaksi	Int	11	Primary Key,
2	Id_transaksi	Int	13	Transaction number
3	Jenis_kegiatan	Varchar	40	Withdrawal for
TOTAL			64	

3. Table tx_proyek

No.	Nama Field	Type of Data	Length	Remarks
1	Id_proyek	Int	11	Primary Key, autoincrement
2	Nama_proyek	Varchar	30	Project name
TOTAL			41	

4. Table mst_approval

No.	Nama Field	Type of Data	Length	Remarks
1	Id_approval	Int	11	Primary Key, autoincrement
2	Jenis_form	Varchar	30	Type of form used
3	Ide_user_kadiv	Int	13	Id user Head of
4	Id_user_kadep	Int	11	Id user Head of
5	Approval_kadiv	Varchar	20	Approval Head of
6	Approval_kadep	Varchar	25	Approval Head of
TOTAL			110	

5. Table tx_pertanggung_jawaban_um

No.	Nama Field	Type of Data	Length	Remarks
1	Id_pertanggung_jawaban_um	Int	10	Primary Key, autoincrement
2	Id_um	Int	11	Amount of down
3	Dikembalikan	Int	25	Amount of
4	Ditagih	Int	30	Amount of
5	Id_proyek	Int	9	Project name
6	Id_approval	Int	12	Head
TOTAL			97	

6. Table tx_permohonan_um

No.	Nama Field	Type of Data	Length	Remarks
1	Id_um	Int	11	Primary Key,
2	Jmlh_terbayar	Int	20	Amount of money to be paid
3	Id_approval	Int	12	Head approval
TOTAL			43	

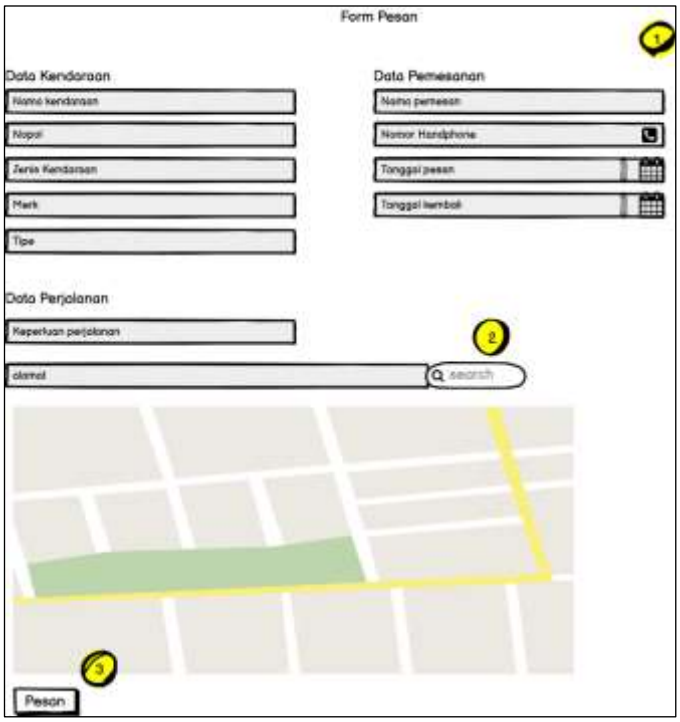

Figure 12 User Interface reservations

The picture above is the interface for booking a vehicle, here is a description of each item:

- Order data is a feature for customer data input (mobile phone number, date of order, and date of return)
- Search is a feature to search for the destination point of the trip.
- button: to place a vehicle order.

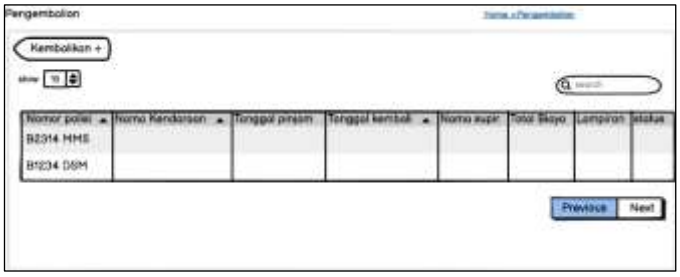

Figure 13 User interface vehicle back

The picture above is the interface for returning the vehicle to the driver role, here is a description of each item:

- Kembalikan button is a feature to add the returned vehicle data.
- Search is a feature to search for returned vehicle data.
- cetak nota perjalanan button: to print trip notes.

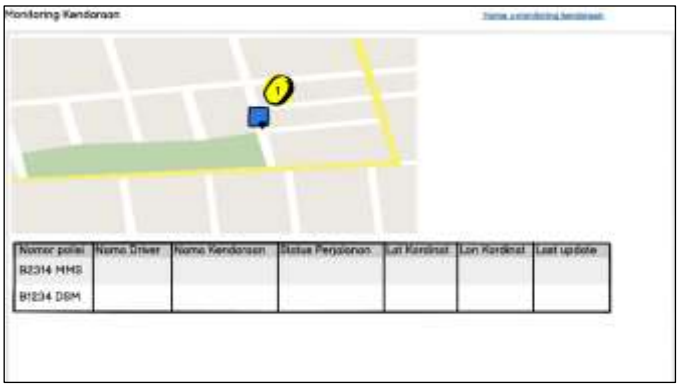

Figure 14 Users Interface monitoring

User Interface users

The picture above is an interface for vehicle monitoring in the Pool Head role, here is a description of each item: car button: to view trip details and driver location points.

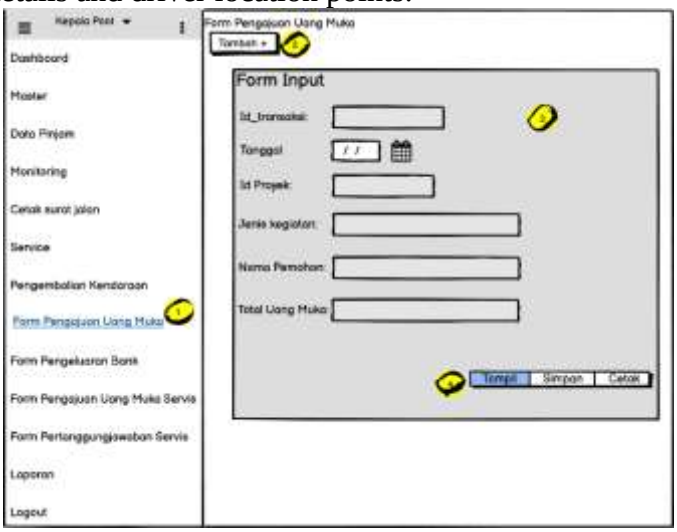

Figure 15 User Interface Advance Payment

The picture above is the interface for Advance Payments for the Pool Head role, here is a description of each item:

- The head of the pool chooses the down payment request form to display the form to be filled.
- Tambah button: to add a down payment request form.
- Filling out the required input form and details
- Tampil button, to display the data that has been filled.
- Simpan button, to save the file.
- Cetak button, to print the document and it will be given to finance.

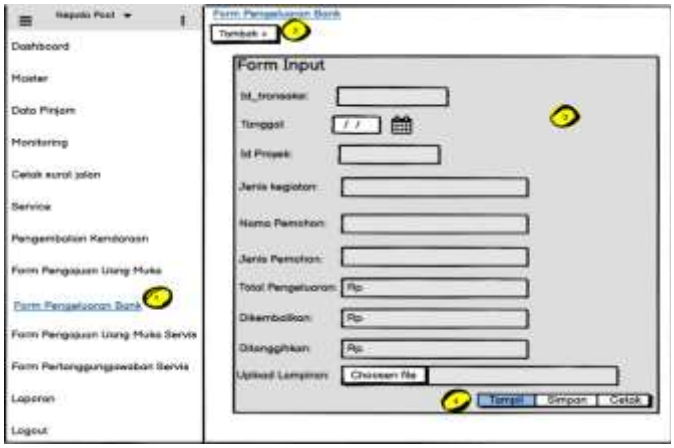

Figure 16 User Interface Bank Expenditures

The picture above is the interface for Bank Expenditures in the Pool Head role, the following is a description of each item:

- The head of the pool chooses the bank disbursement form to display the form to be filled in.
- Tambah button: to add a bank disbursement form.
- Filling out the required input form and details
- Tampil Button, to display the data.
- Simpan button, to save file.
- Cetak button to print the document and it will be given to finance.

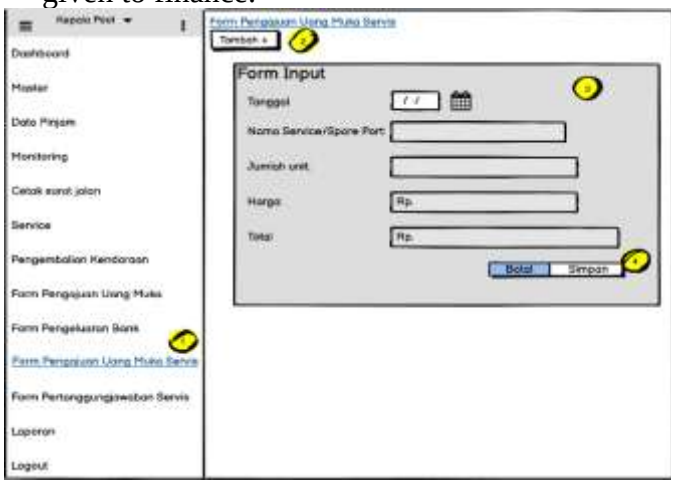

Figure 17 User Interface Service down payment

The picture above is the interface for submitting a service down payment on the Pool Head role, here is a description of each item:

- The head of the pool chooses the bank disbursement form to display the form to be filled in.
- Tambah button: to add a service down payment request form.
- Filling out the required input form and details
- Tampil button, to display data that has been filled.
- Simpan button, to save the file.
- Cetak button to print the document and it will be given to finance.

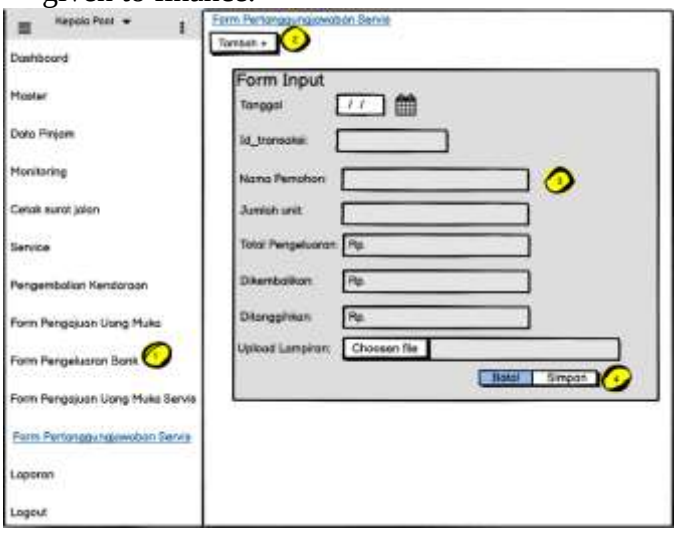

Figure 18 User Interface Accountability

The picture above is an interface for service accountability in the Pool Head role, here is a description of each item:

- The head of the pool chooses the bank disbursement form to display the form to be filled in.
- Tambah button: to add service accountability form.
- Filling out the required input form and details
- Tampil button, to display data that has been filled.
- Simpan button, to save the file.
- Cetak button to print the document and it will be given to finance.

IV. RESULTS

The following is an implementation of the user interface design

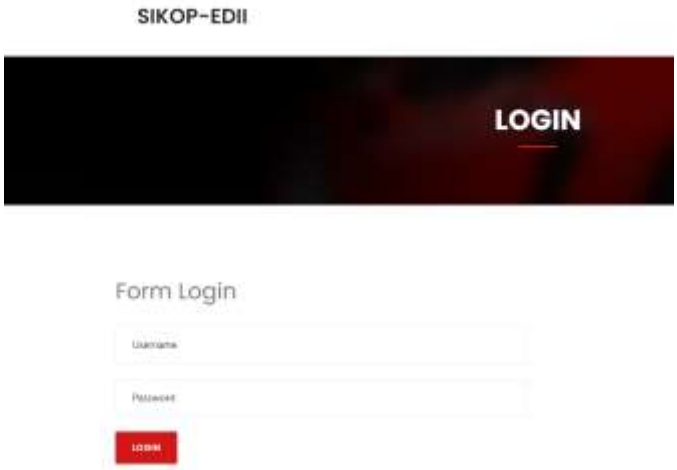

Figure 19 user login

Implementation of the log in page display for users who already have an account, the user enters a username and password to be able to enter the application.

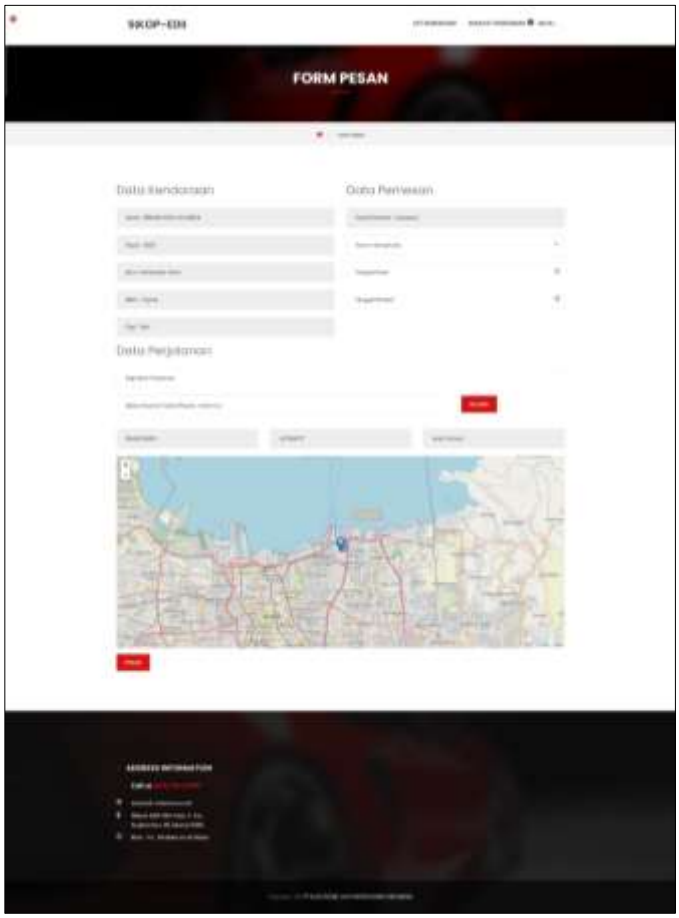

Figure 20 reservations

Implementation of the Dashboard page display, users who have logged in first will be directed to the Dashboard page.

Figure 21 driver page

Implementation of the visitor page display, in this application there is a visitor list menu. users can manage visitor data on this page.

Figure 22 Head Vehicle page

Implementation of the Owner page view. User can manage Owner Data on this Page.

Figure 23 Report Head Vehicle page

Implementation of the Tenant Page display, on this page users can manage apartment tenant data.

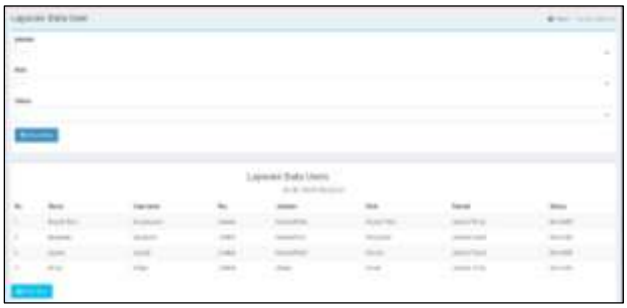

Figure 24 Report Head Vehicle page

Implementation of the Unit Stock Page display, on this page users can manage apartment unit stock data.

Figure 25 Report driver page

Implementation of the Reservation Page display, on this page users can manage Apartment Reservation data.

Figure 26 Report service page

Implementation of the Extension Page view, on this page users can manage Apartment extension data as needed.

Figure 27 Head page

C. Testing

no.	field module	sub module	input result	status
1.	login	login admin	wrong	success
2.	master user	add user	wrong	success
		edit user	wrong	success
		delete user	correct	success
3.	master position	add position	correct	success
		edit position	wrong	success
		delete position	correct	success
4.	master role	add role	correct	success
		edit role	wrong	success
		delete role	wrong	success
5.	master vehicle	add vehicle	correct	success
		delete vehicle	correct	success
6.	master driver	add driver	wrong	success
		edit driver	correct	success
		delete driver	correct	success
7.	loan data	detail view	wrong	success
		choose driver	correct	success
8.	config starts point	search location	correct	success
		save location	wrong	success
9.	monitoring vehicle	view location	wrong	success
10.	letter document	print letter document	correct	success
		update location	wrong	success
		approve	correct	success
11.	service	add schedule service	wrong	success
		add data service	correct	success
		detail view	correct	success
		print	wrong	success
		process payment	correct	success

12.	vehicle return	process travels note	correct	success
		print	wrong	success
		add vehicle return	wrong	success
13.	booking vehicle	booking vehicle	correct	success
		cancell booking	wrong	success
14.	report	vehicle report	correct	success
		vehicle usage report	wrong	success
		service report	correct	success
		user report	correct	success
		driver report	wrong	success
		driver vehicle report	correct	success

V. CONCLUSIONS

Based on the research conducted, the conclusions are:

1. To design an operational vehicle information system at PT Electronic Data Interchange Indonesia, existing business process information is required and analyzed using the prototype system development method by coding and testing. Application testing is carried out to ensure that every menu in the system runs according to requirements.
2. Operational vehicle information system has established to manage vehicle ordering information, vehicle plotting, vehicle maintenance reports and approval of vehicle maintenance bill fees which facilitate the management of operational vehicles at PT Electronic Data Interchange Indonesia.

The monitoring module makes it easier for the pool head to review the driver's journey whether it is in accordance with the purpose of the trip or not and is able to review the driver's position and this helps plotting the vehicle for the next employee booking

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