VTS

Vehicle Tracking system is a system, with a goal of tracking the GPS location of vehicles. Not only does VTS track the real-time location of vehicles but has several accessories that aid in alerting the responsible municipalities of the following:

- The real-time location of the vehicle
- The moment the vehicle overspeeds and by how much
- Alert for drivers in distress
- The identity of the driver driving the vehicle

The VTS system is supported with a VTS device master and 3 other accessories which are:

- IButton – Identifies the driver in the vehicle with the aid of fingerprints
- Buzzer – Alerts the municipalities in charge when the vehicle is over the speed limit
- Panick Button – Sends Alert signal to the municipalities in charge when the driver is in distress

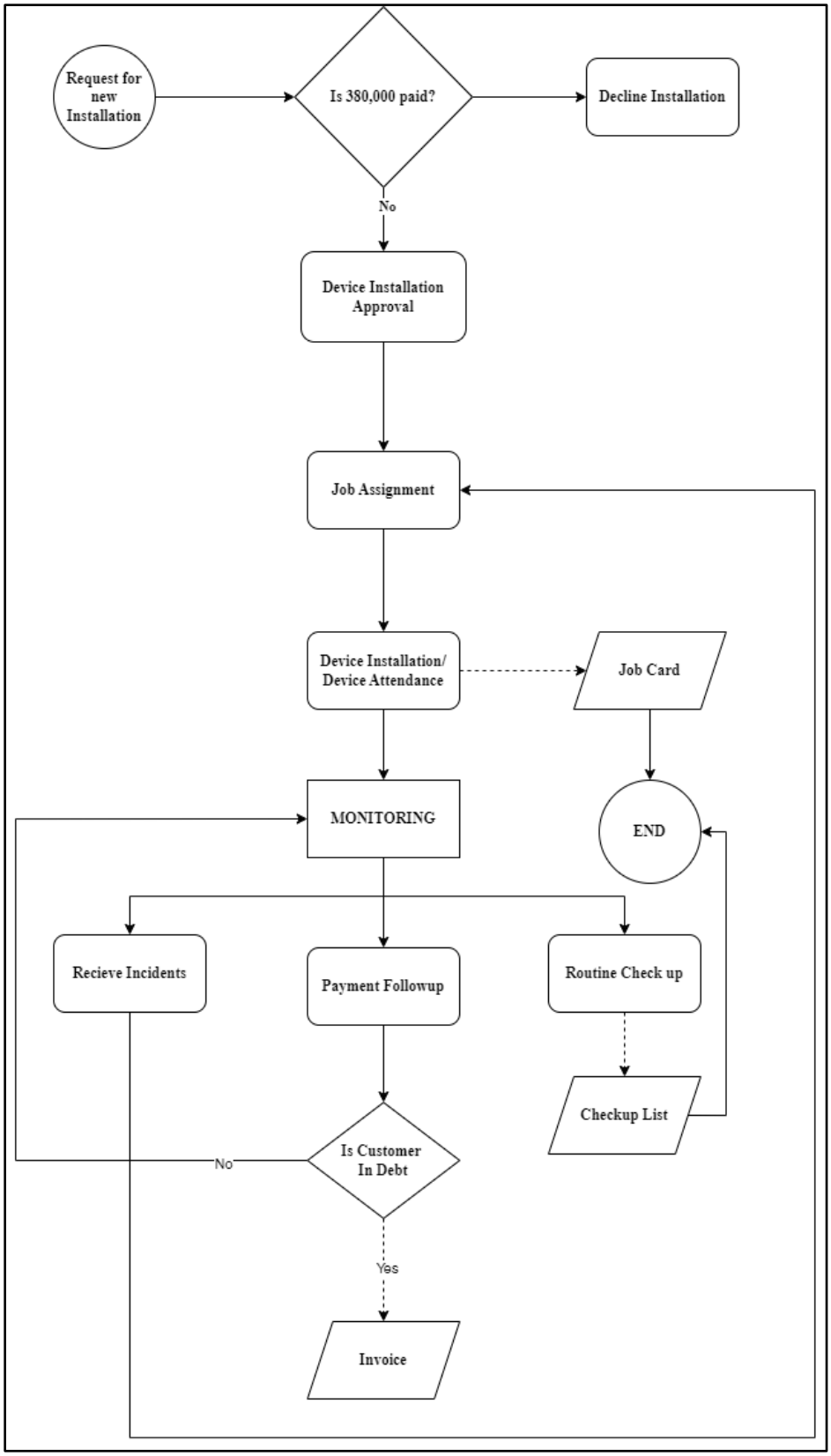
This document serves the purpose of showing the understanding of the whole working process of the VTS system from installation of those devices, payment, to monitoring. The understanding of this system will aid in the development of the software system whose sole purpose will be to facilitate and/or streamline the working process of the VTS allowing good audit process.

VTS Working Understanding

As Identified earlier there is a master device and 3 other accessories which all together provide the full capacity of the VTS System. The following are the steps taken in the VTS cycle

1. Customers call the Head office for a new installation of the vts device
2. The customer is expected to pay 380,000 tshs for their Initial installation. Where;
    - 300,000 is the price for the device
    - 80,000 is the service charge for four months from the initial installation (@20,000tsh per month)
3. The head office assigns a technician to the vehicle for the installation
4. The Head office and the municipalities begin monitoring process
    - The head office performs daily checkup for vehicles in the terminal to determine their working state
    - The municipalities monitor the progress of those devices in transit, and reports any and all malfunctions or incidents

- The head office monitoring team, assigns the reported incidents to technicians.
- The technician closest to the vehicle attends to it and sends back a job card to the HQ, showing the work done, and conclusion made
- Customers also sends out incidents to their vehicles and the head office assigns the job to a technician.
- Payment of the service charges is then monitored and customers are sent invoices according to their debts
- Once a device requires full replacement, the customer will have to pay the cost of a new installation



VTS Figure 1: VTS General Flow chart

After a clear understanding of the several process that surround the VTS environment. We will now take each step and break it down to functionalities that should be part of the system. Before that it is important to highlight the main actors of the system (users who will be directly interacting with the system), while highlighting the actors of the system it is important to also show the indirect users of the system who whose data or Input will affect the system data.

System Actors

1. Project Manager (HQ)
2. Monitoring Officer (HQ)
3. Accountant (HQ)
4. Technician

Indirect system Users

1. Customer
2. LATRA

MONITORING USECASE

This section of this document clearly and vividly analyses the monitoring aspect of the VTS System. The monitoring officer as identified earlier their sole purpose is to monitor the VTS system.

Working flow of the VTS Monitoring

PART I:

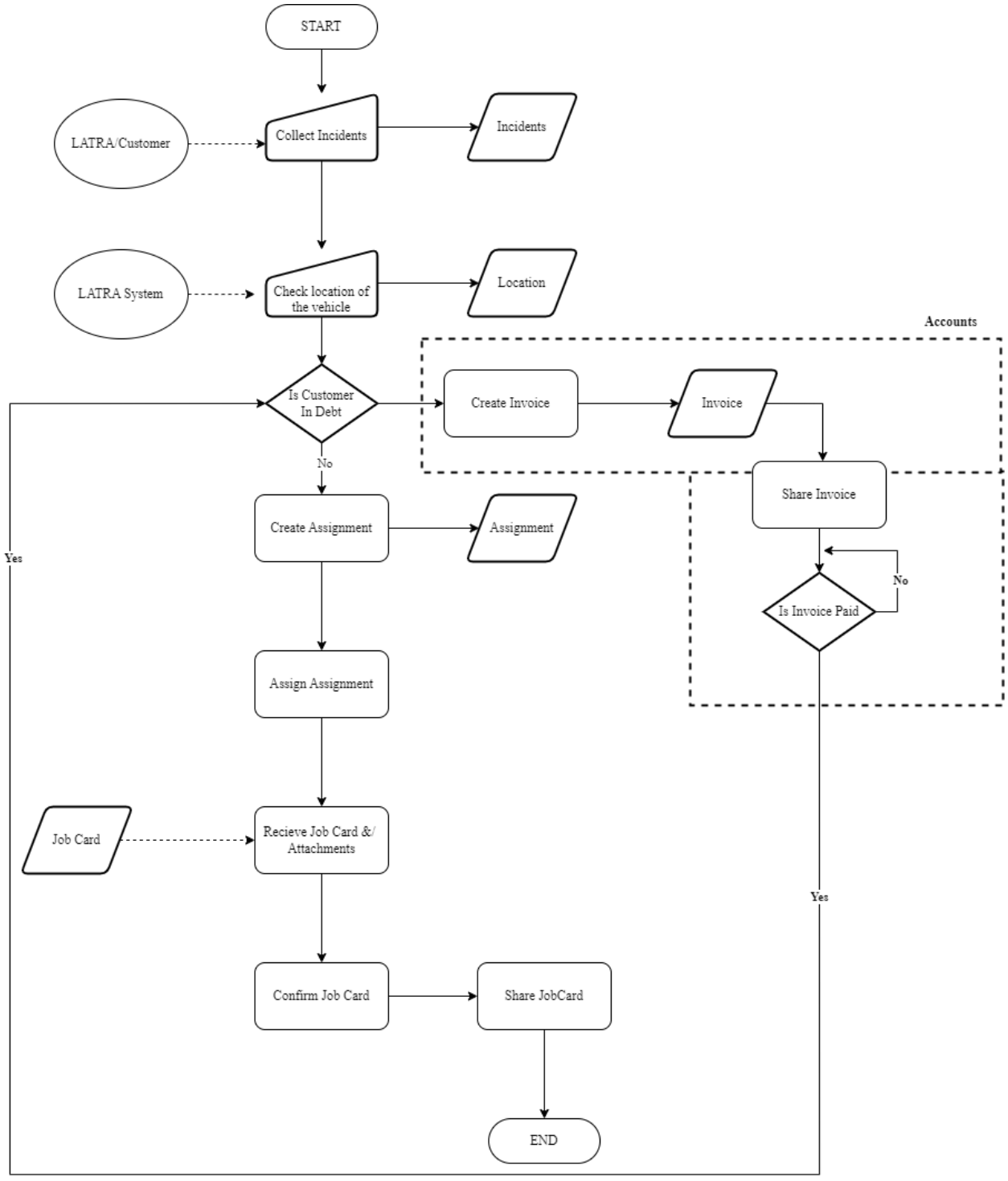
1. Check LATRA emails to note down the incidents they have reported
2. Check in the LATRA Map where the vehicle reported is
3. Assign vehicle to the technician
4. Waits to receive the job card and photo evidence of the job done and the conclusion made
5. Reports back to LATRA, attaching the Job card and specifying the conclusion reached

PART II:

1. Recieves and documents routine checkup list from the technician in charge of the terminal

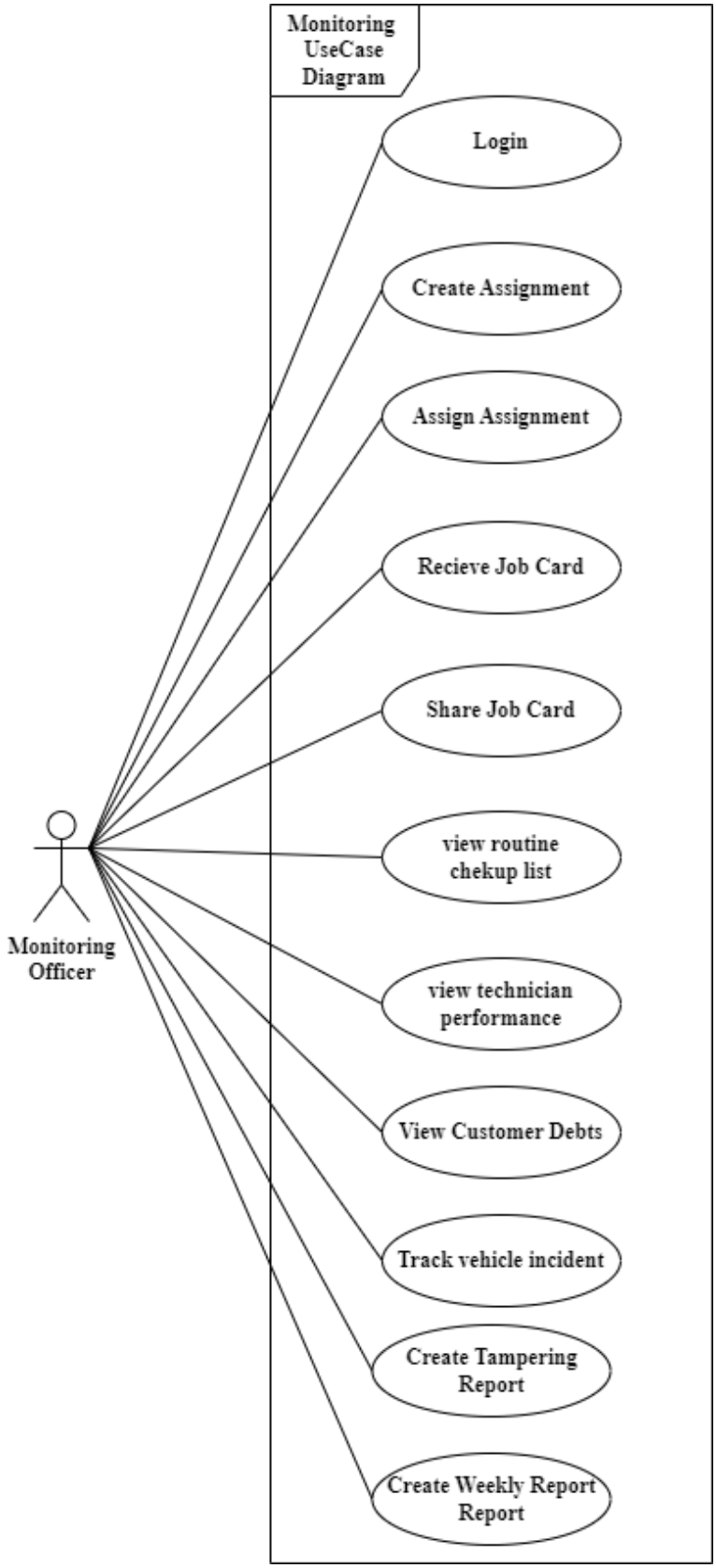
PART III:

1. Recieves Malfunctions information from the Customer
2. Check to see if the customer is in debt, if not in debt
3. Assigns the vehicle to the technician
4. Waits to receive the job card and photo evidence done, and drive out a conclusion
5. If the customer is indebt, ask the customer to reduce their debts, and goes back to step 3



VTS Figure 2: VTS Monitoring Flow Chart

After the clear understanding of the vts monitoring functionalities, let us dive down to the individual usecase diagram and usecase description



VTS Figure 3: Monitoring officer Usecase Diagram

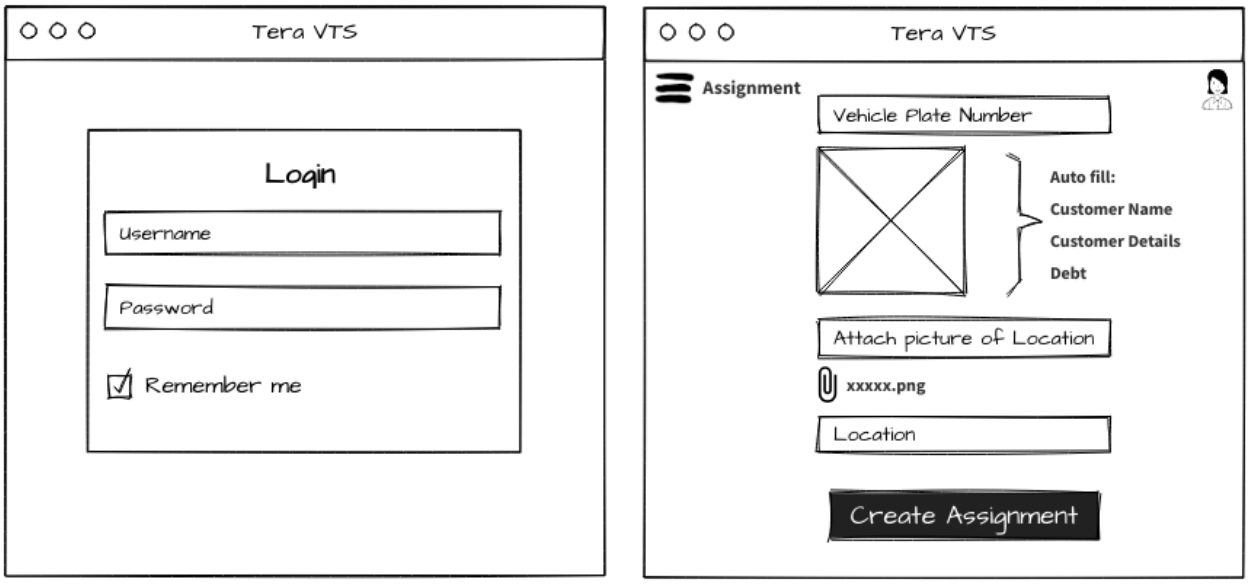
VTS Table 1: Monitoring Usecase description Table

Usecase	**Usecase Description**
Login	The system should allow the user to login
Create assignment	The system should allow the user to create assignment. During creating the assignment the user should only fill in the plate number of the vehicle. The system should autofill the following details • Name of customer • Customer contact details • Customer debt The system should allow the user to • attach a picture of location and/or write the location of the assignment • the name of the reporter • the case reported -Skipping -Black box Data -Device Tampering -Start and stop Journey -Internal Battery Low -External Battery Disconnected -Rollover Detection -Emergence Trigger -Panic Button -Non Transmission
Assign Assignment	The system should allow the user to assign the created assignment to technicians (1 or many)
Receive Job Card	The system should allow the user to receive and veiw the job card, with its attachements • A picture before Inspection • A picture after inspection

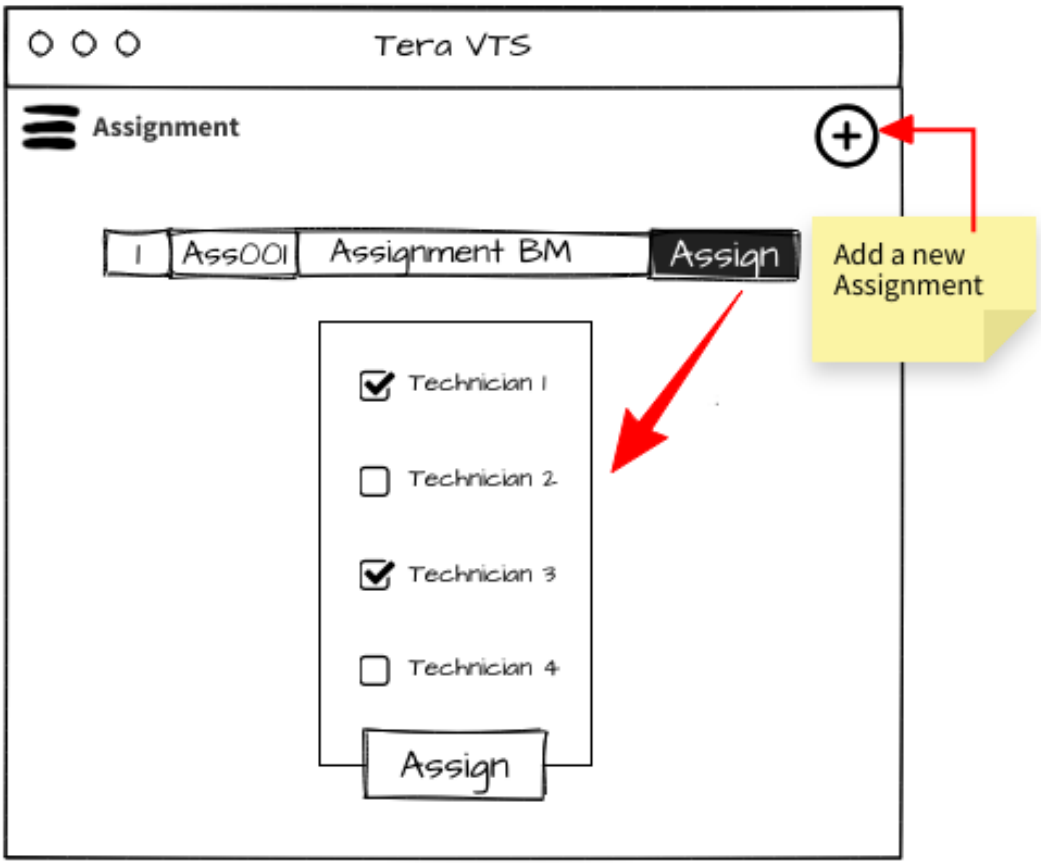
	• A picture of the Vehicle showing the Plate number If the job card comfirms tampering the following extra attachments should be added • A picture of evidence of Tampering • A video comfirming Tampering The system should allow the user to keep or discard the attachments (Attachments kept to the system should only be kept in the system for a maximum of two weeks) The user should be able to view in summary the following details ➢ Job Card Id ➢ Customer ➢ Date of response ➢ Technician ➢ Reported by
Share Job Card	Once the Job card is confirmed, the system should allow, the sharing of the job card (png or pdf)
View routine chekup list	The system should allow the user to view the checkup list as filled by the technician, and be able to view previous chekup list
View Technician Performance	The system should allow the user to view the technician performance • View the number of incidents attended to
View Customer debt	The system should allow the user to view customer debt and last payment
Track vehicle	The system should allow the user to track incidents attended to by the technician on that vehicle. The system should offer the number of incidents and the type of incidents in a graphical manner
Create Tampering report	The system should allow the user to create a tampering report, according to the attachments, the

	system should also prompt the user to add the pictures of the tampering trend of two days prior the incident
Create Weekly Report	The system should allow the user to create a weekly report of the system
View reports	The system should allow the user to view the reports created by filtering the dates and the type of report

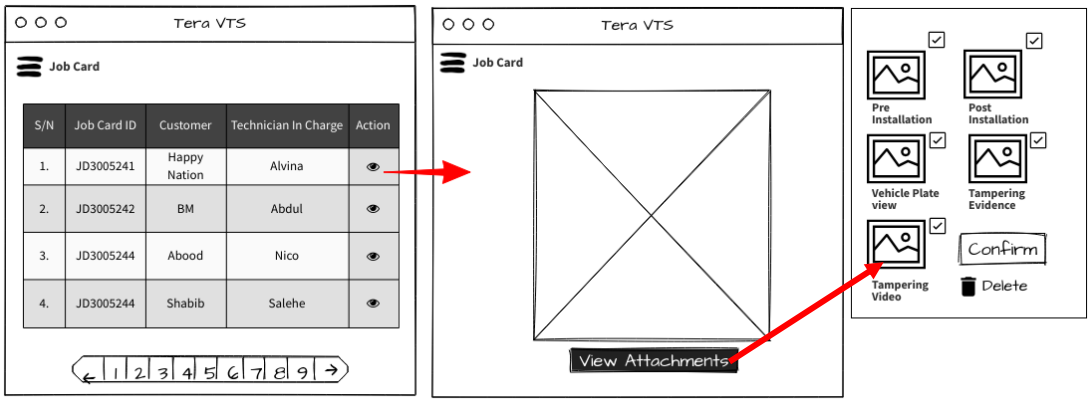
Please refer to the following mockup wireframes to get the ideal picture of the VTS system:



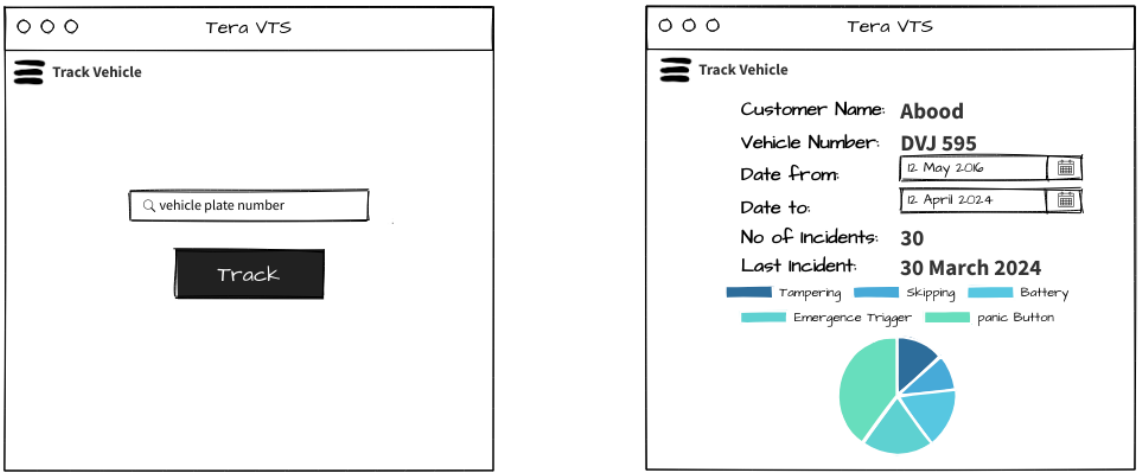
VTS Figure 4: VTS Monitoring login and Create Assignement Wireframes



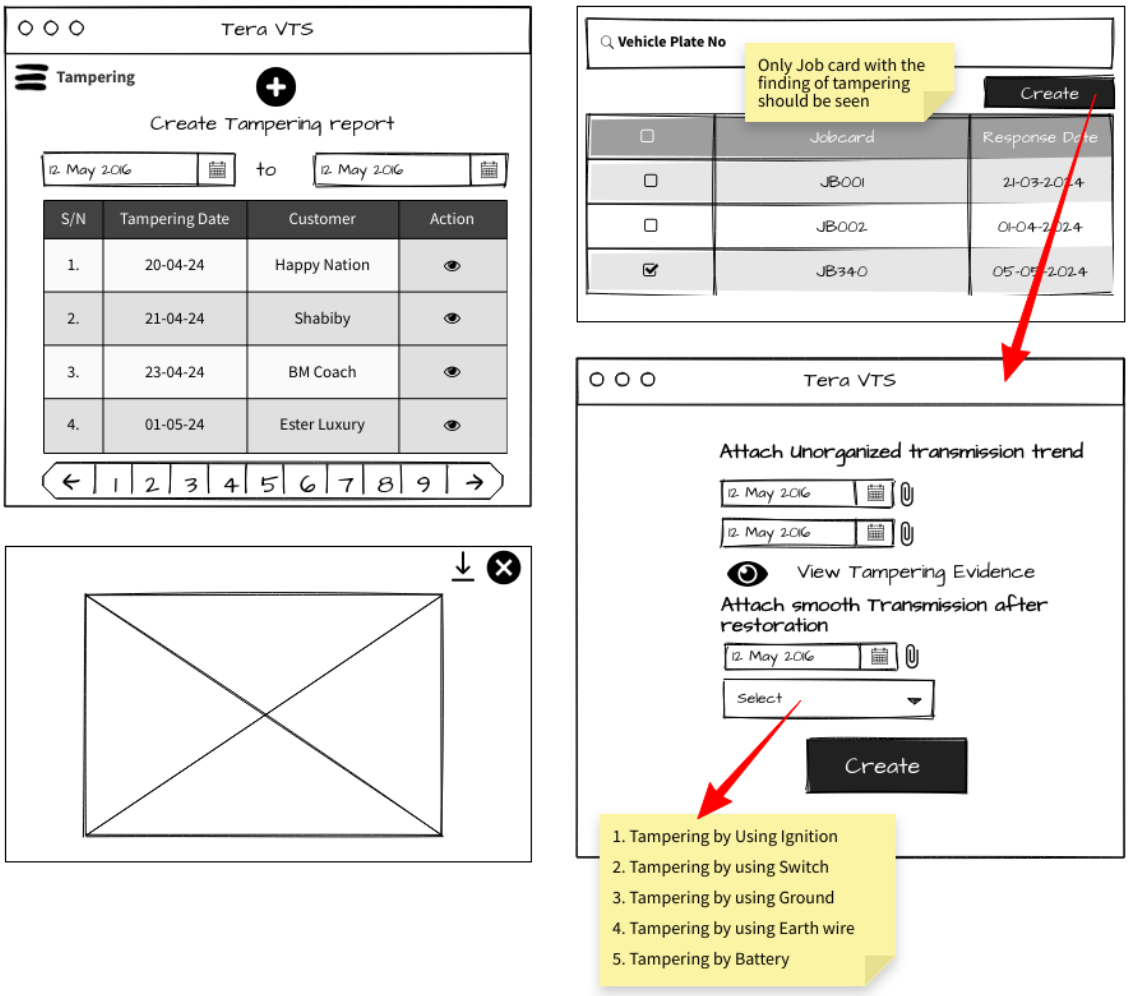
VTS Figure 5: VTS Monitoring Assigment Wireframe



VTS Figure 6: VTS Monitoring Job Card Wireframes



VTS Figure 7: VTS Monitoring Vehicle Track Wireframe



VTS Figure 8: VTS Tampering report Wireframe

The system should create a weekly report in the following format:

VTS Table 2: Weekly report Format

Reported Date	Customer Name	Bus Plate Number	Contact	Reported By	Reported Case	Assisgned Technician	Findings	Response Status	Response Date

1. Reported Date: The date of the Assignment Creation
2. Customer Name: Name of the Vehicle Company / Customer Name
3. Bus Plate Number: The plate Number of the bus that was reported
4. Contact: Phone number of the company
5. Reported By: Who reported the Incident
6. Reported Case: What was reported by the reportee
7. Assigned Technician: Who accepted the the assignment
8. Findings: What was concluded by the techician
9. Response Status: Attended or Not Attended (Cheked or Not Checked)
10. Response Date: Date the Job card was created

NOTE: Not all wireframes are involved in this document. The system designer and developer should remember that this system should have the capabilities of view and exporting various reports. The following are the reports that the system should have

i. Daily Weekly report
ii. Tampering Report
iii. Monthly Report
iv. New Installation Report
v. Incident Report (Charts and graphs)
vi. Invoice report

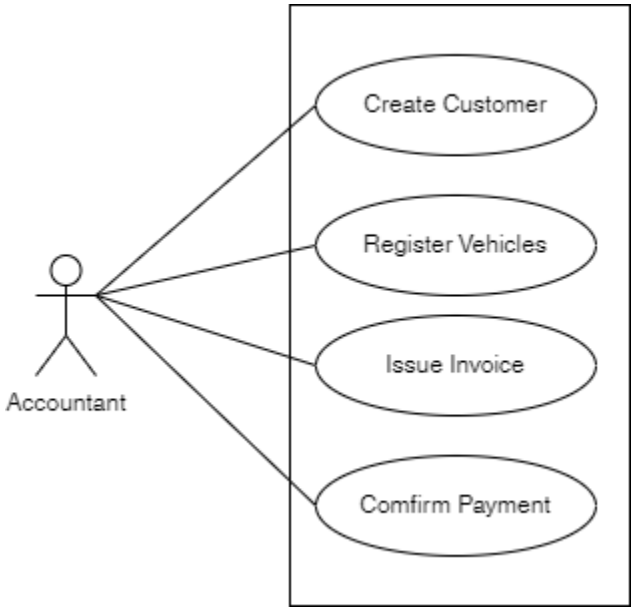
FINANCE AND ACCOUNT USE CASE

To understand what the usecases are for this section we need to understand what the finance and accounts person does and their cycle of operations.

Finance and Account Operations

1. Create Customers
2. Create Vehicles
3. Create Invoices
4. Confirm Invoice Payment
5. Track Debts

So this TEAM, registes a customer and their vehicle then after if the track had old debts that need to be onboarded they will have to be added, after the team tracks payment according to they monthly schedules.



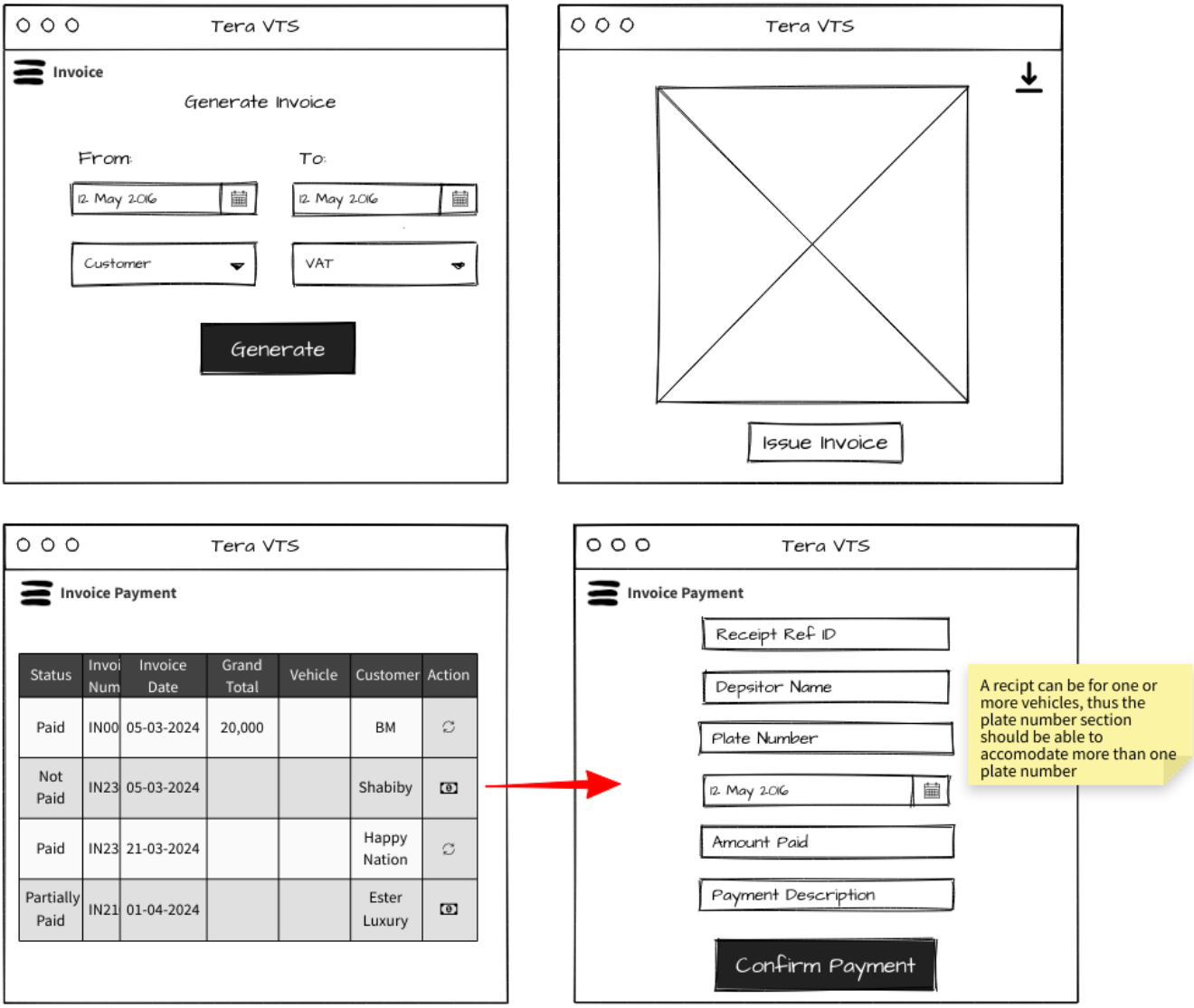
VTS Figure 9: Accountant UseCase Diagram

Because the Issue Invoice and the Comfirming payment are explained graphically in their wire frame, the usecase description table shall not include them

VTS Table 3: Accounts and Finance use case Description

UseCase	**UseCase Description**
Create Customer	The system should allow the user to create customers. To onboard a customer the following details have to be captured: i. Customer Name ii. Address iii. Phone Number iv. Tin Number

	v. Email Address vi. Start Date The system should allow bulk registration
Register Vehicles	The system should allow the Accountant or PM to register vehicles under their customers to register the vehicle. The system should allow bulk registration



VTS Figure 10: Account and Finance wireframes

TERA TECHNOLOGIES AND ENGINEERING LIMITED

Supply, Installation and maintanance of Telecoms Networks and Equipments, PABX and Unified Communication, Networking and Connectivity Solutions,CCTV, Access Control Systems, Fire Alarm systems, Electrical and power systems, and All Types of Office Automation Equipments

REGISTERED CONTRACTOR IN ELECTRICAL (CLASS THREE) _ TELECOMMS, ICT AND SECURITY SYSTEMS (CLASS ONE) _ HVAC (CLASS TWO) _ CIVIL (CLASS FOUR)

Office: Mbezi Beach Africana, Plot No. 2283, Block H, Tarangire Street, Bagamoyo Road/Africana Drive, P.O. Box 31257, Dar es Salaam, Tanzania Tel/Fax: +255 22 2701611, Cell: +255 713 899 309, +255 767 598691 E-mail: info@teratech.co.tz, Website: www.teratech.co.tz
Email: info@teratech.co.tz, Website: www.teratech.co.tz

TAX INVOICE FOR VEHICLE TRACKER INSTALLATION

Bill to:
EVODIUS JASSON MARANGURWA
P.O.BOX 99,
KAGERA
TIN;
PHONE;+257525079809

VRN: 40-012572-C

TIN: 114-690-775

INV No:	TTEL/2024/252
INV Date:	28/05/2024
Prepared by:	Paschal Somwald

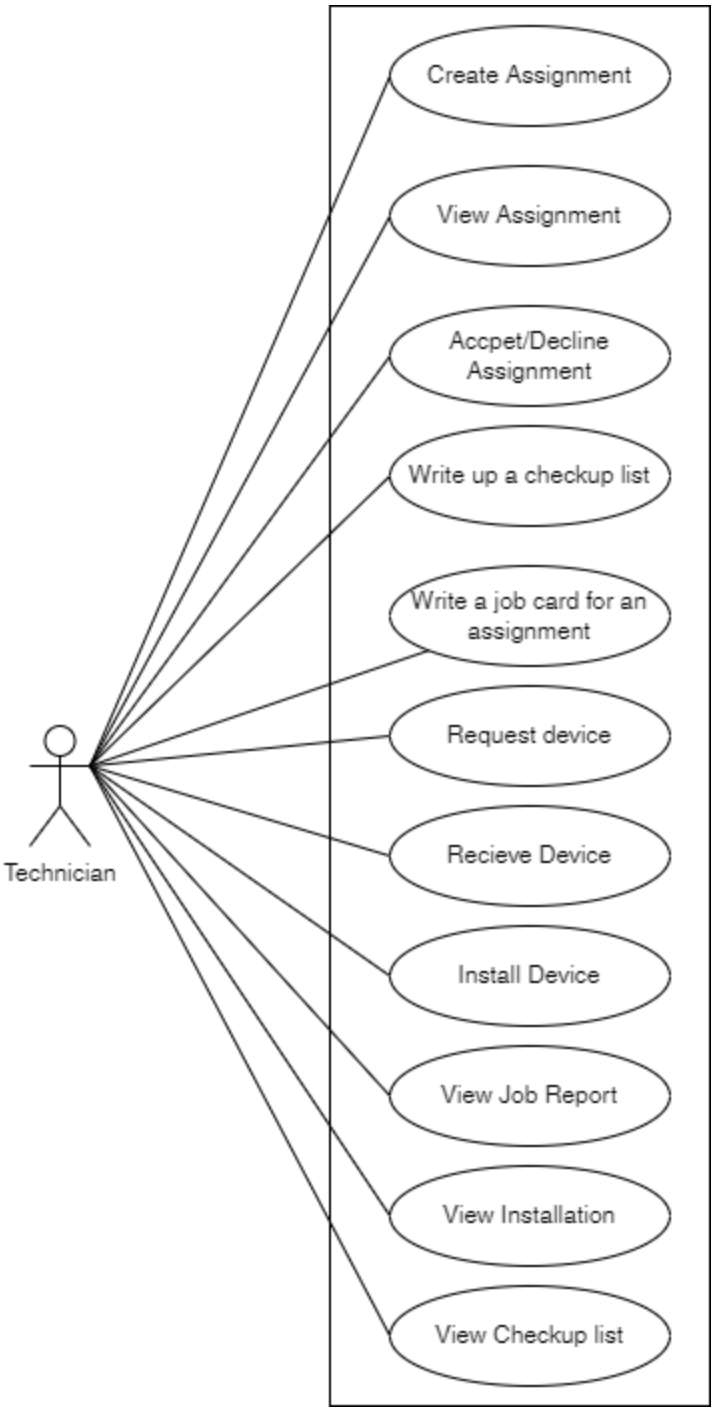
Item	Description	No. of Cars	Period (Months)	UOM	Unit Price (TZS)	Gross Value (TZS)
1	Service charges for OBU/GPRS for 6months(JAN2024-JUNE2024)@20,000 T626EDW	1	6	EACH	16,949.15	101,694.92
	BANK ACCOUNT DETAILS Account Name: TERA TECHNOLOGIES AND ENGINEERING LIMITED Bank Name: CRDB BANK PLC Account Number: 0150259553801 Branch Name: Mlimani City Swift Code: CORUTZTZ					
			Sub - Total before VAT			101,694.92
			Add 18% VAT			18,305.08
			Total Amount Inclusive of VAT			120,000.00
	Prepared By: Accountant:Paschal Somwald For: TTEL		SIGNATURE & OFFICIAL STAMP			

VTS Figure 11: VTS Invoice Sample

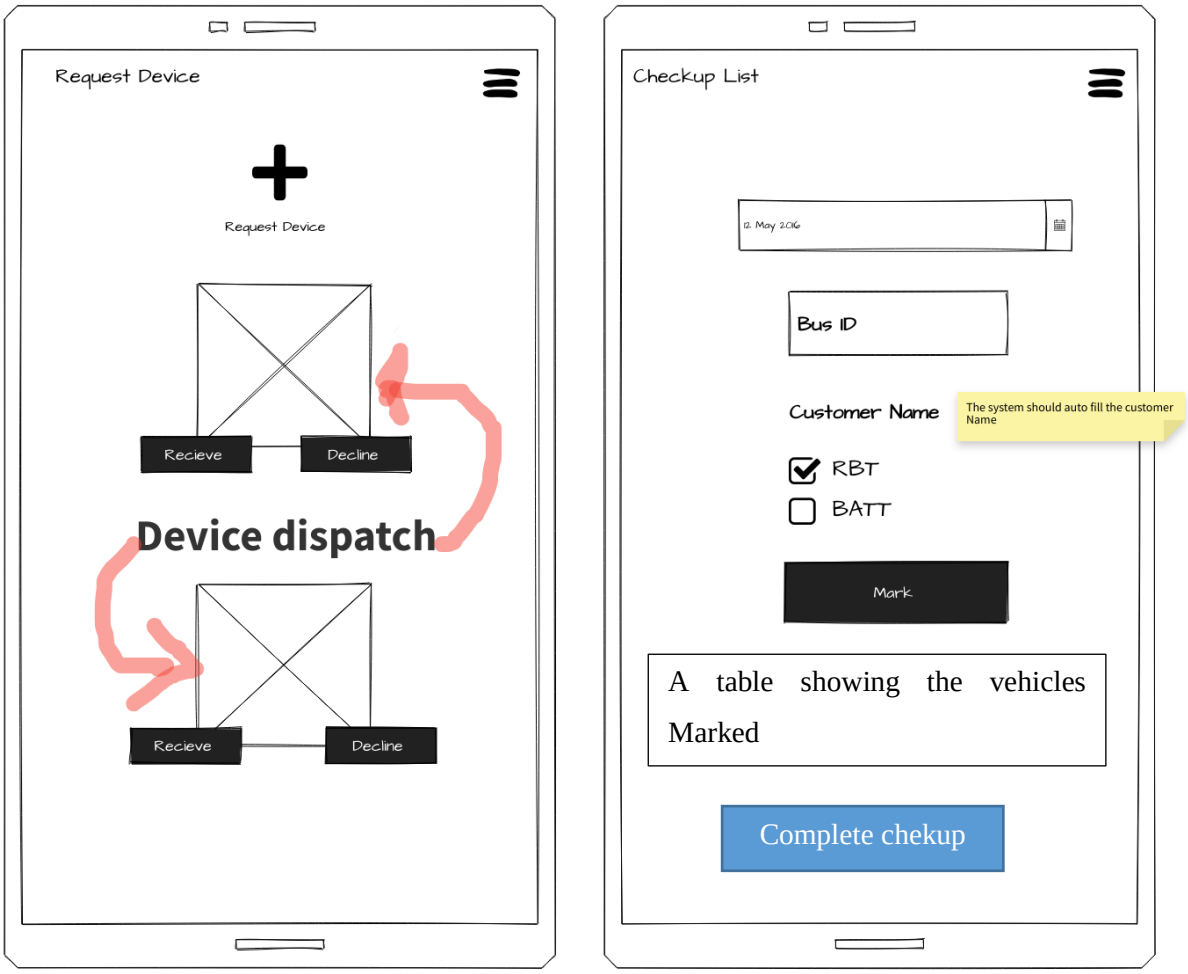
Note: From the understanding of the VTS system, the accountant should also be able to view and approve installation request as per the attached receipt. The module of approval will be discussed in the requistion approval of devices under the Project managers module

TECHNICIAN

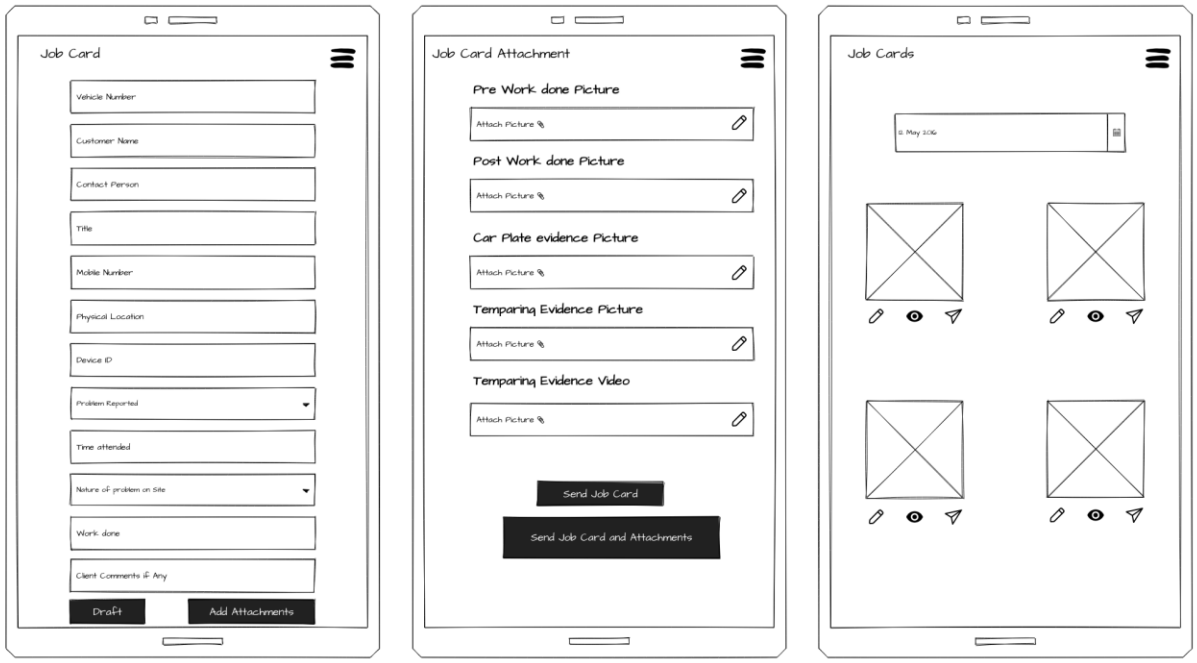
This section will demonstrate the working function of the technician, and all his operations.



Most of the technician usescases are well understood without indepth detail. I shall reserve the usecase description for this module until further through.



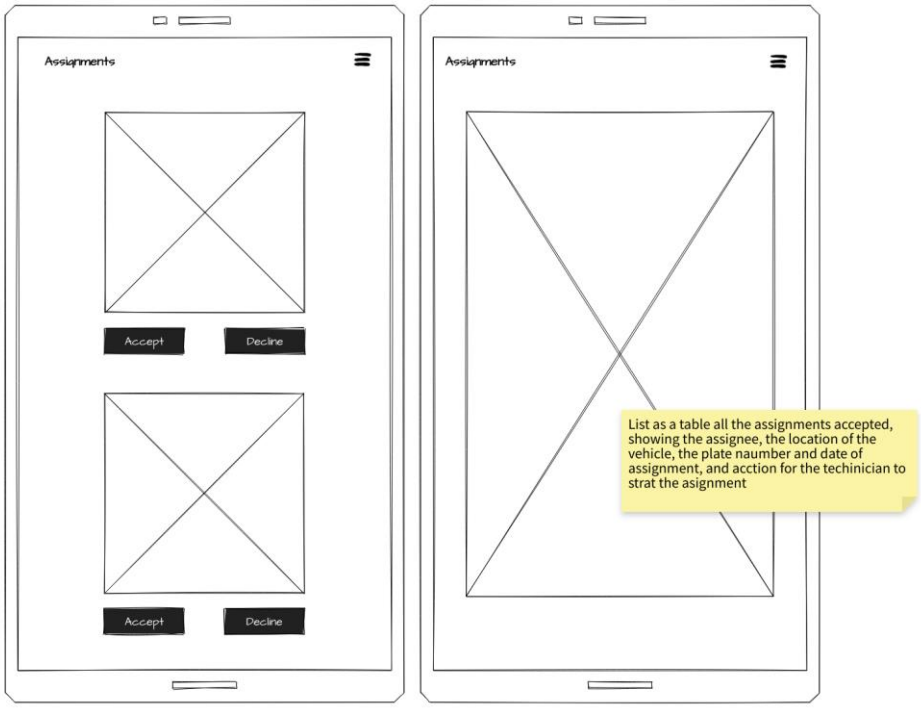
VTS Figure 12: VTS Technician Device Recieve and Checkuplist Wireframe



VTS Figure 13: VTS Technician Assignment Module Wireframe

The following is a list of nature of problems at the site, to be used at the drop down when technician fills out a job card

- Sim card Problem
- Wiring Problem
- Loose connection
- Tampering by using ignition system
- Tampering by using switch
- Tampering by using ground
- Tampering by using Earth wire
- Device Location (GPS Failure)
- Device is worn out
- Car Electrical System
- Swollen Battery
- Eaten wires



VTS Figure 14: Techinician Assignments wire frame

From the understanding of the system it was noted that new the technician at the site can receive a request for a new installation, and thus required to:

- Register the installation
- Wait for Installation approval
- Installa the device

But if the installation was sent out to the HQ directly, the technician will be sent out an installation assignment, which would work like any other assignment.

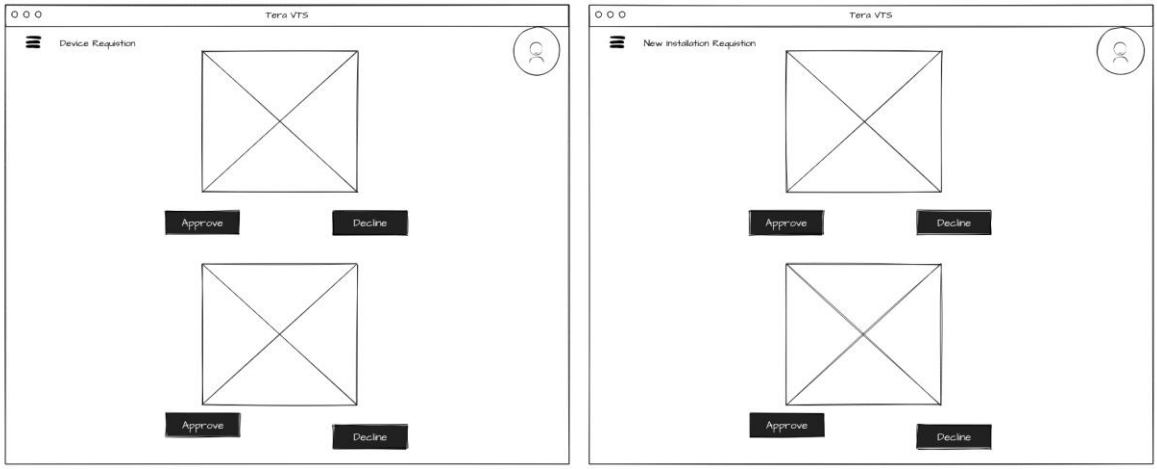
VTS Figure 15: New Installation

PROJECT MANAGER

The following are the usecases and performing functions of the project manager, but it should be noted that all functions except system setting should be accessible to the project Manager. As it is well known, the VTS system could not have become complete without the VTS devices, all of which will be discussed in this module

1. The system should allow the user to create devices

2. The system should allow the user to view device requisition
3. The system should allow the user to view, approve, decline pending requests
4. The system should allow the user to dispatch devices and accessories



VTS Figure 16: VTS Requistion(Device, Installation) approval Wireframe

When the PM registers devices he should be able to do the following

1. Register in Bulk
2. Add Device Model
3. Add device Number

When the PM Dispatches devices he should be able to do the following

1. Choose a device requistion
2. Write the ID of devices
3. Write the number of Accessories

CONCLUSION

After careful consideration and taking into account the weight of this project, this project will be accompanied by a site map, and constantly updated to accommodate changes.