System Architecture

Flowchart Symbols and Color Coding

Preparation or Start-up

Manual data input from device

Retrieval of Stored data

Predefined process (function or subroutine)

Process (function or sub-routine)

On-screen display or messaging

Decision or condition

END

Session Ends

Process link

Process - next stage to execute

Data Link

Data transfer

[Command]

Command execution (Click or Tap)

Simultaneous link, action or execution

Table Name
Table ID

Database table

Workflow process requiring sub-process(es) or external action(s)

Color Coding

Process/Activity Ref. ID.

Database activities: Read, write, search, locate, update, delete, edit, etc.

Process/Activity Ref. ID.

Process activities: Important calculations, APIs, Activations, Deactivations etc.

Edit

Delete

View Location or Locate

View on Google Map

Information

Acknowledge

Assign Vehicle

Unassign Vehicle

FZ2

SUMMARY

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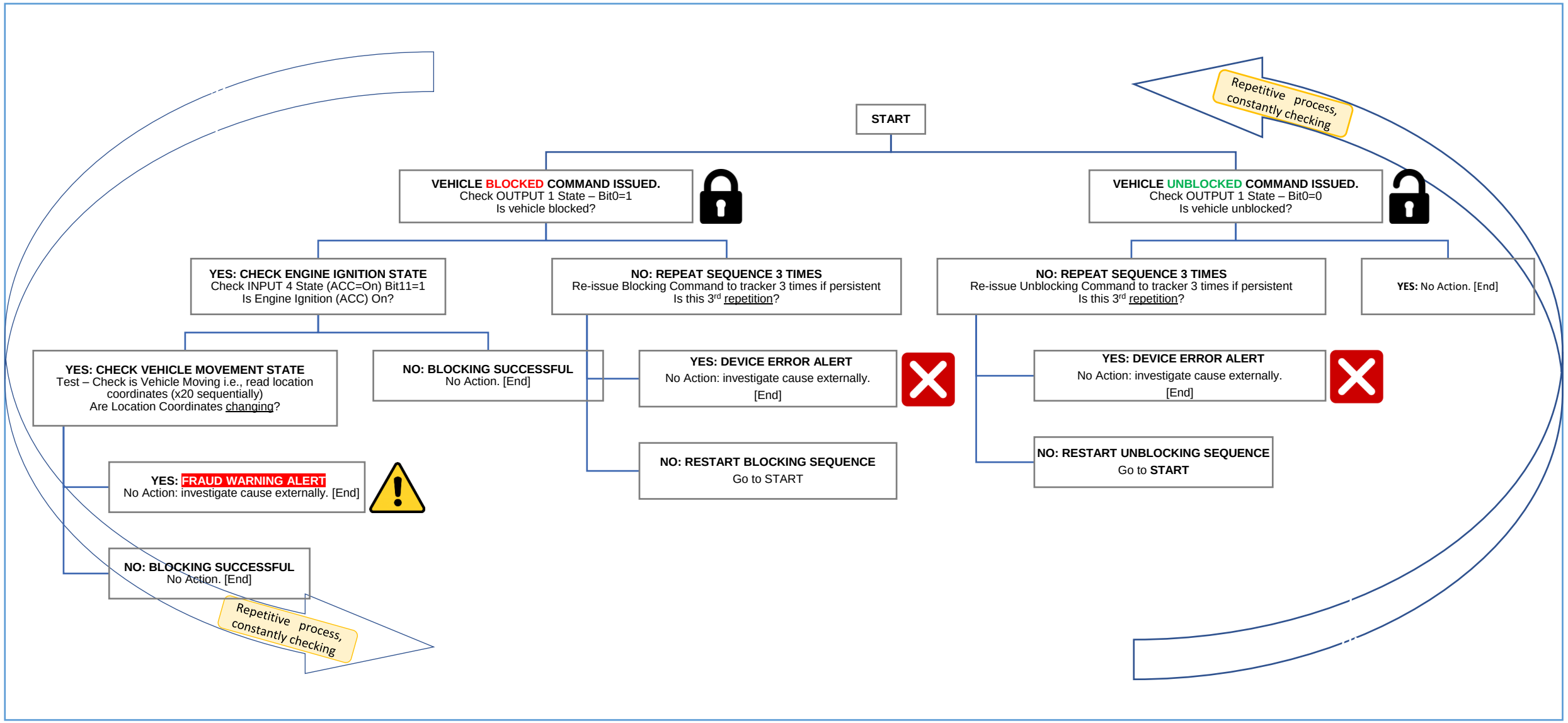
FLEET MANAGEMENT MODULE

VEHICLE BLOCKING / UNBLOCKING MODULE (PROCESS MODIFICATION)

System Flowchart (CS): Vehicle Blocking / Unblocking **(Process Modification)**

	Feature	Background Description and Application	How it works
	Vehicle Blocked "Alert" *This alert is <u>self-rectifying</u> when the condition is satisfied.*	First, we illustrate what it means to block or immobilize a vehicle: to immobilize a vehicle, a command is sent to the tracker unit via SMS. When the command reaches the device, it is interpreted, and the specific OUTPUT connection port is energized. This OUTPUT port would be connected to the neutral end of an auxiliary component to activate or deactivate it. In our case, the auxiliary component is a relay connected across the vehicle's fuel pump circuit. When the designated OUTPUT port connected to the relay coil is activated, this opens the pump circuit, causing the engine to stop – then the engine stops, the vehicle is immobilized. In FZ1, vehicle blocking alert was raised after the EXETR01 process reached its final stage at 12pm. The EXETR01 background process works within the P-CS1 module to monitor the state of payment of the driver and escalates the situation if no payment is received by 12 noon. This is achieved programmatically, and once the blocking command SMS is issued, it is "assumed" that the action is carried out without any external or independent means of verification – this is the first problem.	**Ref. doc:** Oner OCT GPRS Communication Protocol (20171201) 1. A two-way GPRS communication will be established between the tracker unit and the server. The later will issue blocking commands directly to the device. This procedure shall be a second means (in addition to the SMS commands) of issuing commands to the tracking device. The integration of both communication media is to be discussed (TBD). Following is the list of events that would trigger vehicle blocking state: a. Pending payments after 12 noon b. Vehicle insurance expired c. Roadworthy certificate expired d. Driver license expired e. Driver agreement/contract Expired
	Fraud Warning "Alert" *This alert must be <u>acknowledged</u> to be cleared of the chart.*	It has also been observed that the telcos, on some occasions delay in releasing the SMS commands (messages) into the network, causing the messaging sequence to be mixed up at times or sent all at a go, thereby jamming the tracker. On some other occasions, there have been recorded ghost commands sent, days later, to trackers whose drivers have fully paid but got blocked or would unblock defaulting drivers with payments still pending. This situation has caused inconveniences to the users, manager, owners and drivers. Currently, when a report is made about a state of blocking of the vehicle there is no way of validating this fact because there is no visibility on the process.	2. Contained in every data packets sent from the tracker unit to the server is the STATE information of all INPUT and OUTPUT ports on the device unit. Once a blocking command is issued to the device, the corresponding port number activates, and the information is passed to the server alongside the current location details. A subroutine will be created to monitor the STATE of this OUTPUT port number, which shall be the base of information of the "Vehicle Blocked – Alert". The subroutine, must be independent of the events that may have triggered the blocked state. An "I" icon would be displayed in the "Actions" column of the "Alerts" grid that would provide information (only) of the one or all five events that may have caused the blocked state. NB: each of the 5 states to blocking can only be resolved by "Workflow" NOT at Alerts level.
	Device Error "Alert" *This alert must be <u>acknowledged</u> to be cleared of the chart, or request sequence repetition..*	This modification seeks to achieve the following: 1. Explore the dual use of SMS commands and the two-way communication protocol provided by the tracker unit manufacturer to control the tracking output for blocking/unblocking actions. 2. Create an independent and reactive "eye" on the state of blocking of the vehicle which displays an alert immediately and automatically when the blocked signal is sensed. 3. Raise or clear "Vehicle Blocking" alerts independent of the EXETR01 background process. This effectively de-couples the state of blocking to defaulting situations. Blocking alerts simply becomes a state alert or notification as reported by the tracking unit and not consequential to the pending payments by drivers whose debts have gone past 12pm – the two-way communication protocol would provide this feature. 4. In the event of a technical glitch, provide a "controlled" and authorized medium to the client to block or unblock the vehicle, only after the prime reason for blocking has been resolved. 5. The system must detect a fraudulent situation where there the vehicle continues to move even though it has been blocked. This situation may be as a result of physical tamper of the immobilizer on the tracker unit. This modification shall not interfere with the function of the "Workflow" process. The workflow will continue issuing unblocking commands to the tracker when the right conditions are met.	3. On occasions where blocking occurs or persists without reason, or due to a technical glitch, the alert would still display in the grid but this time there would be the following information: "Blocking no cause or reason not found". 4. While the vehicle is in its "Blocked" state we don't expect it to move i.e., Its location coordinates must not change. If that happens then the blocking event was not successful. Several reasons may result in this situation but prominent amongst them could be that (1) the blocking circuitry has been tampered with and that (2) the blocking relay is faulty and does not energize. The "Blocking Failed" Alert would be raised whenever the vehicle continues moving or changing location when, it is supposed to be stationary i.e., while the OUTPUT signal states that blocking is "Active". See System Flowchart. 5. Where, the logic states that Blocking is supposed to be "Active", but the signal is continually in an off state, this failure may be originating from the device itself, hence the "Device Not Responding" Alert would be raised, pointing to the user to do some external checks.

System Flowchart (CS): – **“Vehicle Blocking/Unblocking Failed” and “Device Error” Alert**



Mockup Design: – **Vehicle Blocking, Causes and Status**

Blocking Trigger Events

- Pending Payment after 12pm
- Vehicle Insurance Expired
- Roadworthy Certificate Expired
- Driver License Expired
- Driver Contract Expired

1

2 **Raise Alerts in Grid**

Event Date/Time	Vehicle Reg#	Alert	Active Duration	Event Location	Actions
1/3/2022 11:55	GN8488-17	Vehicle Blocked	1 hour, 2 minutes, 1 second		

3 **Click "I" in Grid**

When the **"I"** is clicked, from ***"Alerts"*** grid a **Modal page** is displayed stating one or possible all the reasons that would cause a vehicle blocked event. It is for information purposes only. Resolving is done in Workflows.

GN8488-17 Vehicle Blocked

Cause(s)

Pending Payment
Vehicle Insurance Expired
Roadworthy Certificate Expired
Driver License Expired
Driver Contract Expired

Ok

Display Modal Page for Information

4

OR

GN8488-17 Vehicle Blocked

Cause(s)

Blocking cause or reason not found.
Please investigate externally.

Ok

When the **"I"** is clicked, from ***"Fleet Manager"*** window grid a **Modal page** is displayed showing the current state of the tracker as well other information.

GN7119-17 Tracker

Status — Normal tracker online state

Ignition:	On	
Vehicle Movement:	Moving	
Tracker Activity:	Online	
GSM Signal Strength:	16	
External Battery Voltage:	12.8V	
Tracker Battery Power:	100%	
Immobilizer Status:	Off	Block
Buzzer Status:	Off	Turn On

Ok

GN7119-17 Tracker

Status — When NO cause or reason found

Ignition:	Off	
Vehicle Movement:	Stopped	
Tracker Activity:	Online	
GSM Signal Strength:	16	
External Battery Voltage:	12.8V	
Tracker Battery Power:	100%	
Immobilizer Status:	On	Unblock
Buzzer Status:	On	Turn Off

Ok

GN7119-17 Tracker

Status — When tracker is offline

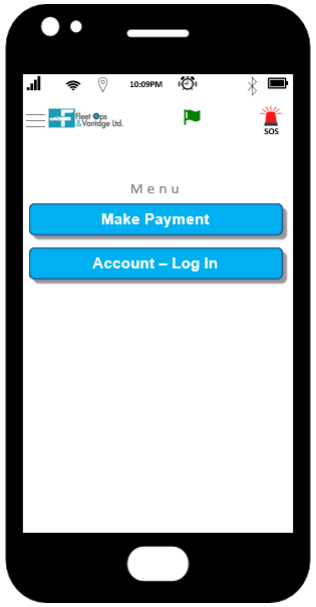
Ignition:	Off
Vehicle Movement:	Stopped
Tracker Activity:	Offline
GSM Signal Strength:	0
External Battery Voltage:	0V
Tracker Battery Power:	0%
Immobilizer Status:	N/A
Buzzer Status:	N/A

Ok

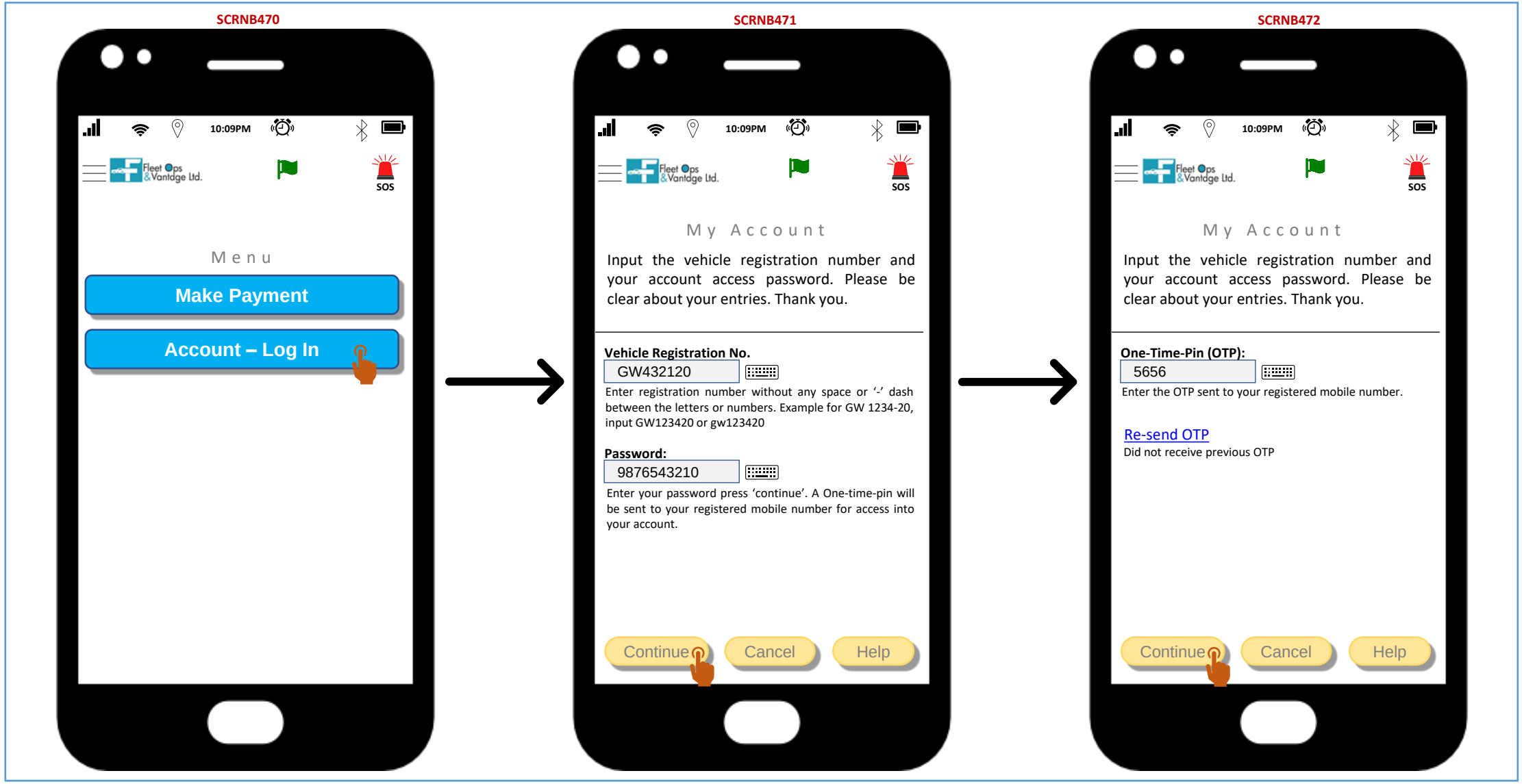
FLEET MANAGEMENT MODULE

DRIVER ACCOUNT ACCESS – LOGIN PROCESS, DISPLAYED CONTENT AND FUNCTION (NEW FEATURE)

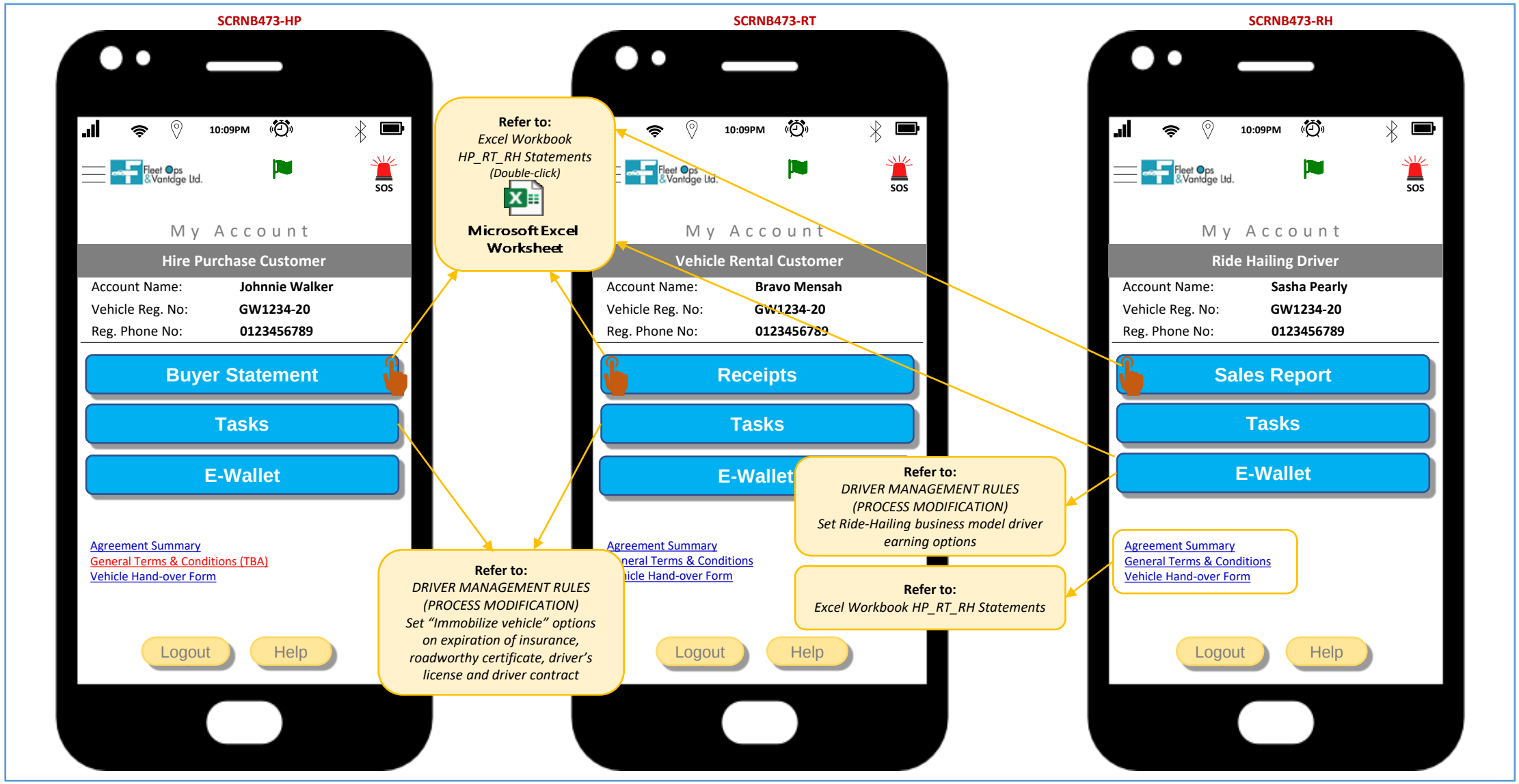
System Flowchart (CS): **Driver Account Access, Displayed Content and Function – Background Details**

	Feature	Background Description and Application	How it works
	Driver Account 	The driver group is composed of **Customers** in the Rental (RT)/Hire-Purchase (HP) models and **Contractors** in the Ride-hailing (RH) model. This groups require different levels of financial services and reporting. For instance, in terms of reporting, whereas a HP customer may require a buyer statement to inform them on the balance on vehicle being purchased, a RT customer simply needs to know the receipts of purchases, their reference and when they were paid. And a RH contractor is a de-facto cash collector for the company so must account for the use of the asset as well as cash derived as well. On the transactional level, the RT and HP models are mainly a paying group. They are purchasing the use of the vehicle for their own purpose. The RH contractor, however, is a worker/contractor who would render services and would be paid for those services rendered. Also, for the nature and remote operations of the RH business model in general, an e-wallet is needed to facilitate payment of remunerations of services rendered, as well as other payments (such as fuel and incentives) needed during the performance of duties. All three models need an e-wallet but for different reasons. For RH it will be for the payment of their remunerations, incentives and fuel to be purchased etc. as mentioned above. For RT and HP, the e-wallet will be used mainly for payment of refunds or other amounts due the customer. IN general terms the e-wallet works the same way across board. A summary of Statements and reports and their formats is embedded here. Microsoft Excel Worksheet **Reports** - ***User Activity Report***: this report will record all logins and user activities on the platform. The details of contents in this report would be discussed in detail.	From the current URL: https://www.fleetopsgh.com/driver an **Account Log-in** menu item is added. The driver account will be one that is accessed through conventional means but also has the tightest security features. It will have a 2-way login process; the first is the vehicle number and an assigned password that can be changed by the user. Once the first level is successful, an OTP (one-time-password) is sent to the driver's phone for log-in completion. Different sub menu items appear for the different group of drivers or business models as follows: **Hire-Purchase Client:** Buyer Statement: presents a full statement of all payments, and balance on vehicle purchase price to date. It is basically a history of all transactions and events that occur during the entire purchase agreement as it may record defaults, penalties, and even repossessions etc. **Vehicle Rental Client:** Receipts: it displays all payments made by the customer and their receipts numbers. For purposes of brevity, only the receipts of the past 4 transactions shall be displayed at a time. **Ride-Hailing Contractor:** Sales Report: presents a full statement of all declared sales and payments made after declaration etc. **General:** Tasks: All business models may have tasks to perform in the course of the use of the vehicles. Some tasks are mandatory to be performed such as the renewal of insurance, roadworthiness of the vehicle and driver license etc. For mandatory tasks, the vehicle would be blocked on expiry dates. For non-mandatory ones such as service and inspection due dates, they would be for informational purposes mainly but persistent. E-Wallet: This is a basic account where positive sums can be withdrawn. It also displays a summary of credits and debits made on the account e-wallet. When withdrawals are being made, all security protocols and processes shall be followed to ensure there's no bridge. Other Information: On the same pages for all business models, The General FleetOps Terms & Conditions and Vehicle Hand-over Form would be displayed while Sales Agreement, Rental Agreement and Contractor Agreements would be displayed for HP, RT and RH models, respectively.

Mockup Design: **Driver Account Access, Displayed Content and Function – Login Process**



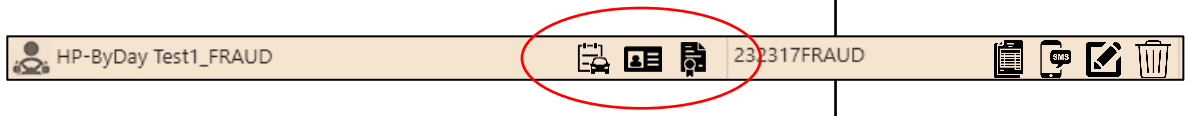
Mockup Design: **Driver Account Access – Login Process, Displayed Content and Function – Menus per Business Types**



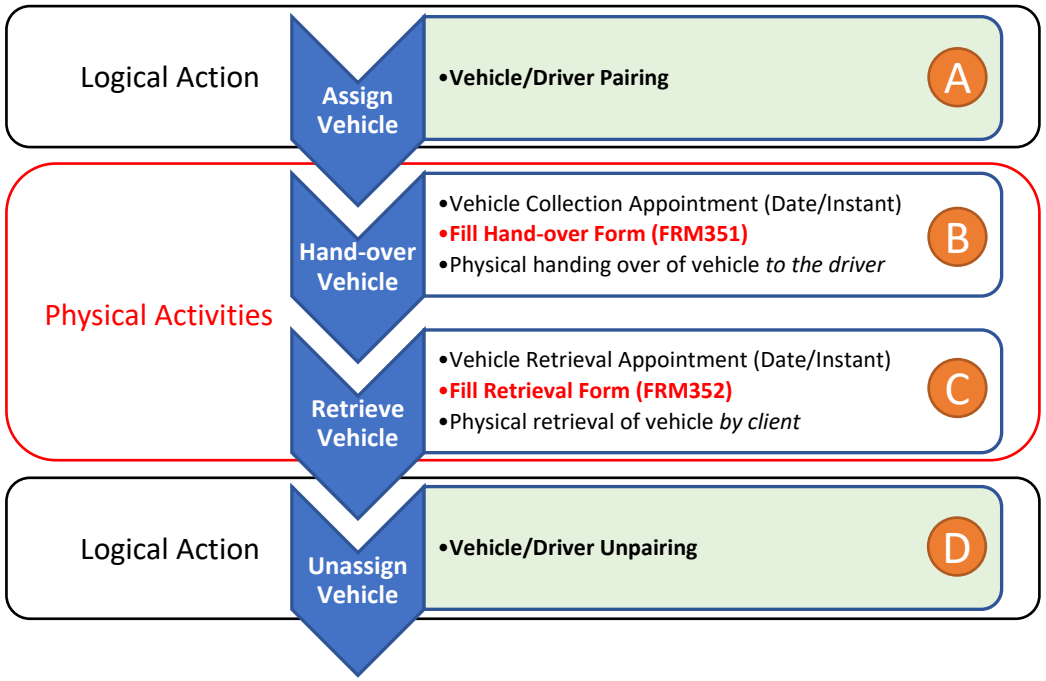
FLEET MANAGEMENT MODULE

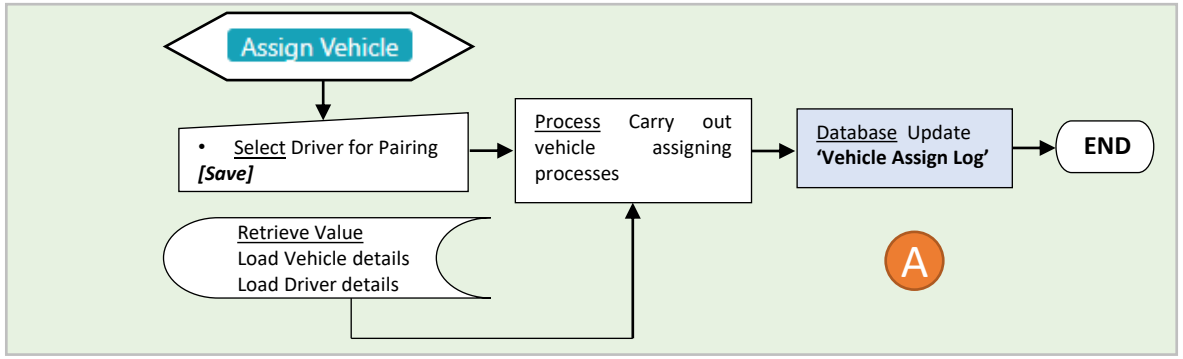
ASSIGN / UNASSIGN VEHICLE (PROCESS MODIFICATION)

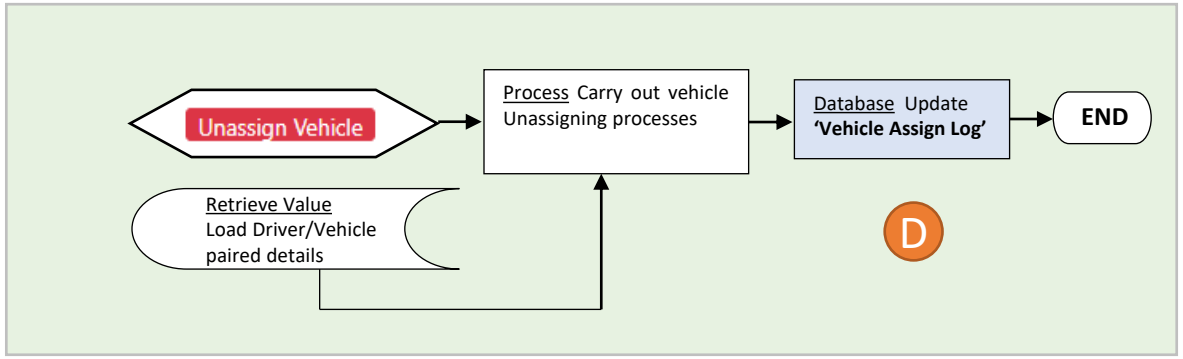
System Flowchart (CS): **Assign/Unassign Vehicle (Process Integration)**

	Feature	Background Description and Application	How it works
	Collection Form **Retrieval Form** **Vehicle Hand-Over Form** **License** **Agreement Summary**	Handing-over and retrieval forms are necessary to prove that the vehicle has indeed changed hands physically. Currently the handing over process is done manually on paper but record keeping is arduous and difficult hence the process is being digitalized. Vehicle inspection prior to handing over or retrieval is as much a legal exercise as it is necessary one. While the vehicle is being used, the driver may cause damages or abuse it. This feature offers a before-and-after comparison of the vehicle. **Reports** - ***Hand-over Form***: while the vehicle is in the possession of the driver, the completed and accepted (non-editable) form should be accessible for viewing and downloading. An icon can be inserted on the "Edit Driver" grid for that purpose. The layout of the form should be such that everything fits on an A4 sheet when printed. - ***Vehicle Hand-over/Return report***: when a vehicle is returned, then the cycle is complete. This report would list all completed cycles of all vehicles in a grid format. When a vehicle number in the grid is clicked, it will open a page that displays the ***Vehicle Condition Report***; In this report FRM351 and FRM352 are displayed side-by-side in a before-and-after layout to highlight the changes on the vehicle after it was returned. - ***Driver information***: on the "Driver Manager" grid, the following icons are displayed to view the Driver Photo, License and Agreement Summary. When clicked, they display their respective elements in a modal form concerning that driver. 	Once the vehicle has been paired with the driver logically in the system, at the point of physical hand-over, the vehicle must be inspected for roadworthiness and safety; and both the driver and client or manager would undertake this exercise together. The vehicle shall not be enabled in the system for use until the hand-over form is completed, saved and accepted. The logical checks and conditions to satisfy prior to displaying the hand-over form are: - Insurance date (Not Expired) - Roadworthy Certificate (Not Expired) - Driver's License (Not Expired) On **handing-over**, Form FRM351 would be walked through and ticked by the client or manager while both walk around and inspect the vehicle physically. Any observed problems or missing items would be noted on the form. Pictures of the 4 sides of the vehicle would be uploaded. Since this is a legal exercise, the driver must accept custody of the vehicle and conditions at which it was handed over by the client. The process of driver acceptance is as follows: a 'One-Time-Code' (CTC) is generated and sent to driver's Contact Number DCN via SMS. Simultaneously, a One-Time-Instance of a completed copy of FRM351 is made accessible via a one-time log-in URL CTU with CTC as password by Driver. The CTU is sent to the Driver's Email Address and/or Contact Number DCN via SMS. While in the page, the driver goes through the form again on display and clicks the " I Accept" button if agreed, which automatically closes the page and sends a completed and PDF'ed copy of Form FRM351 to the driver's email. This completes the process, and the vehicle is now visible on the map as active. On **retrieval or return**, Form FRM352 is used. It is built on the same details as Form FRM351. The same acceptance process is used when the vehicle is being retrieved. But this time, if the driver is not available to accept, the acceptance process can be overridden by the client or manager after the form is completed.

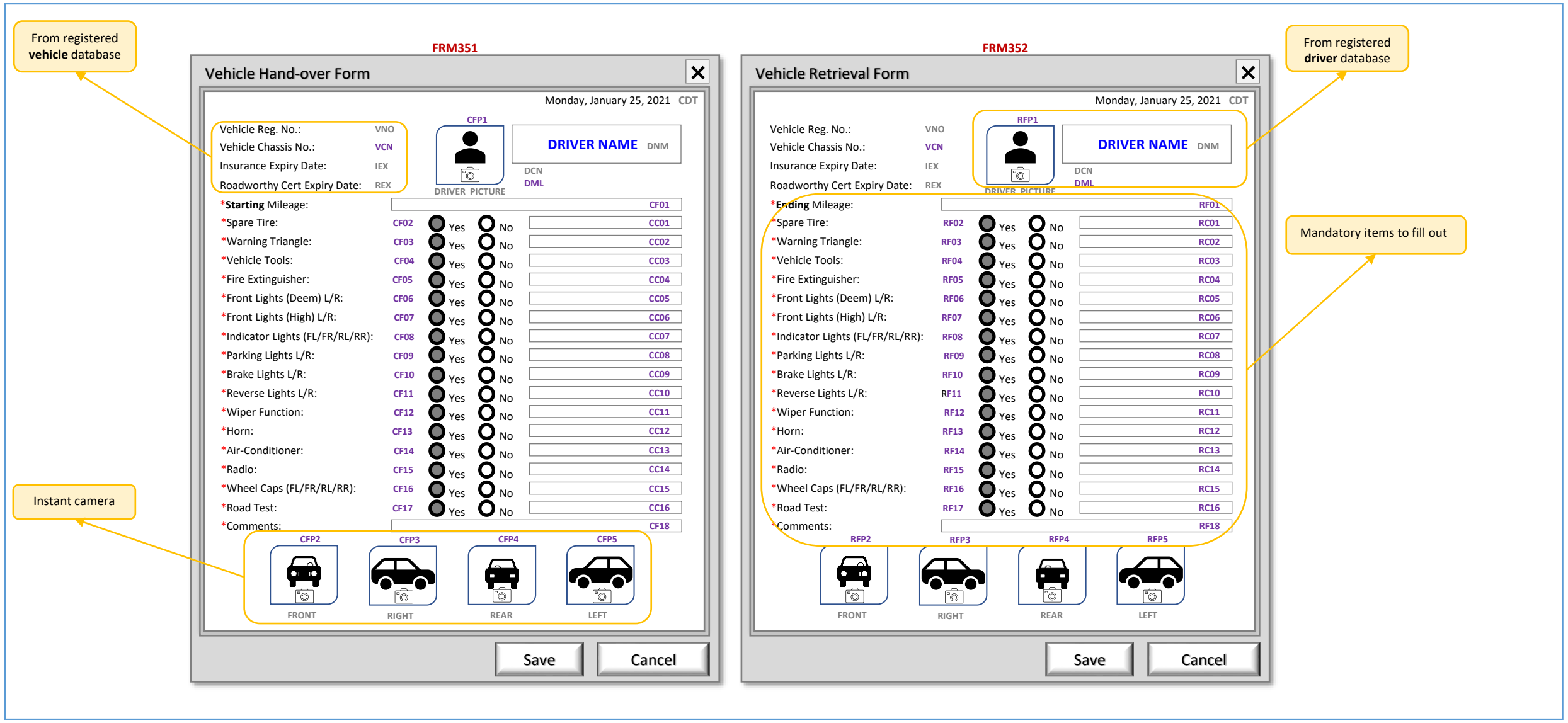
System Flowchart : **'Assign Vehicle/Driver'** – Client Vehicle Assign / Unassign – Process



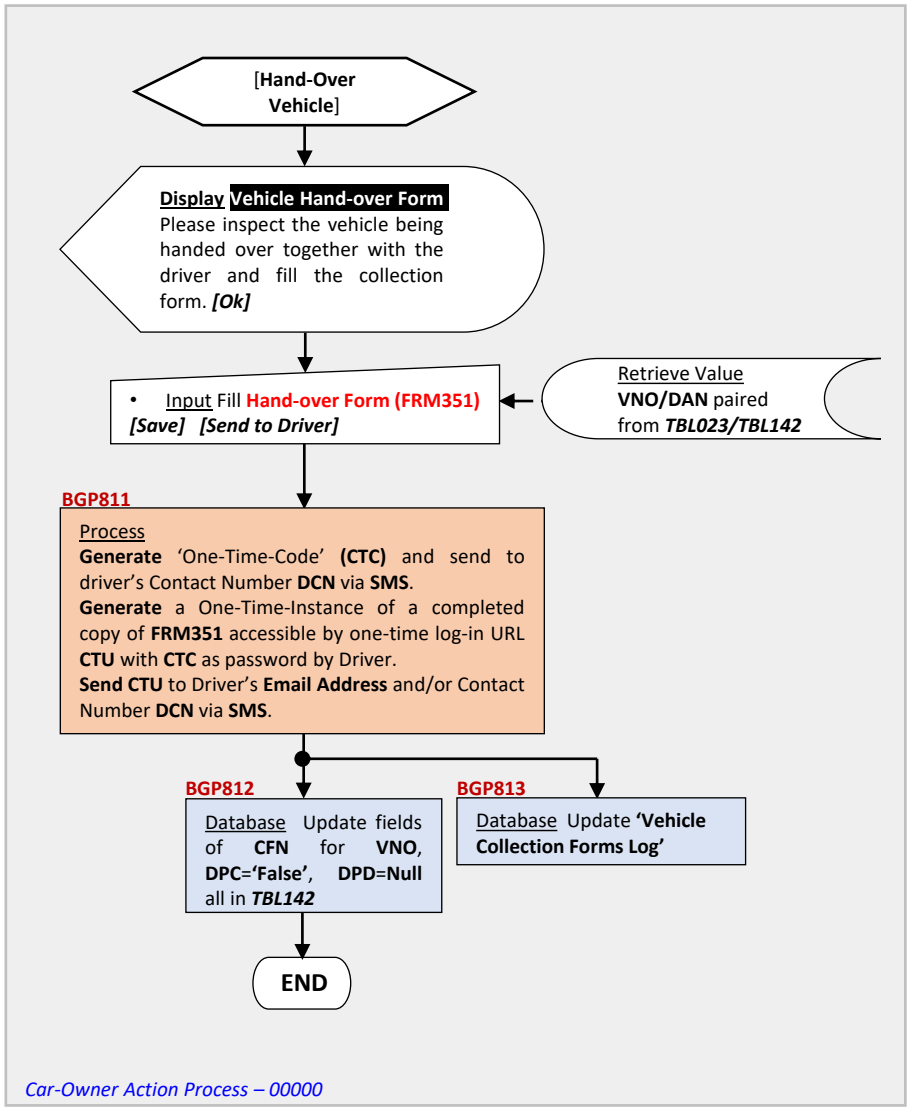


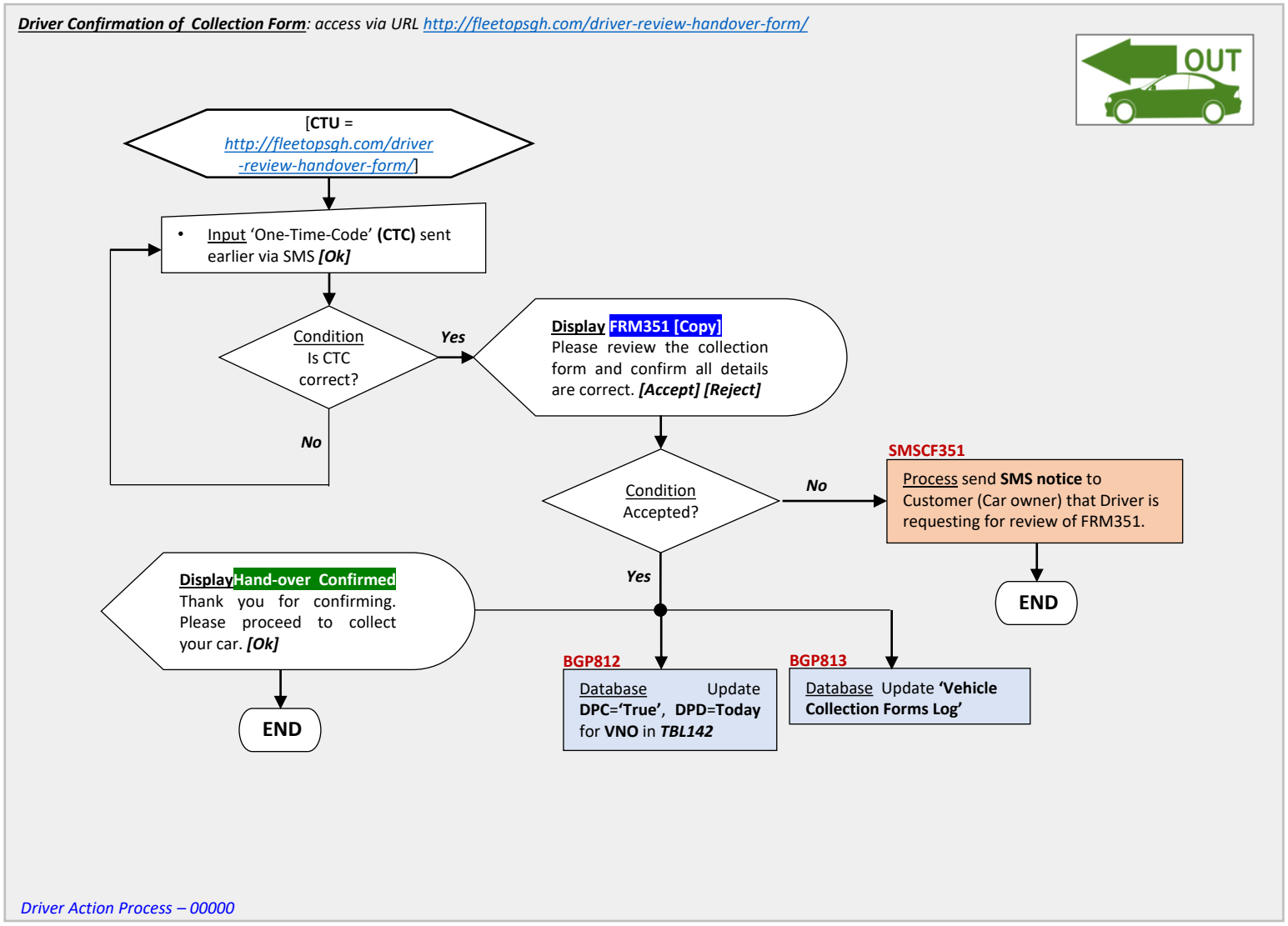


Mockup Design: **'Assign Vehicle/Driver'** – Client Vehicle Assign / Unassign – Process (Physical Action: **Hand-over Form / Retrieve Form**)

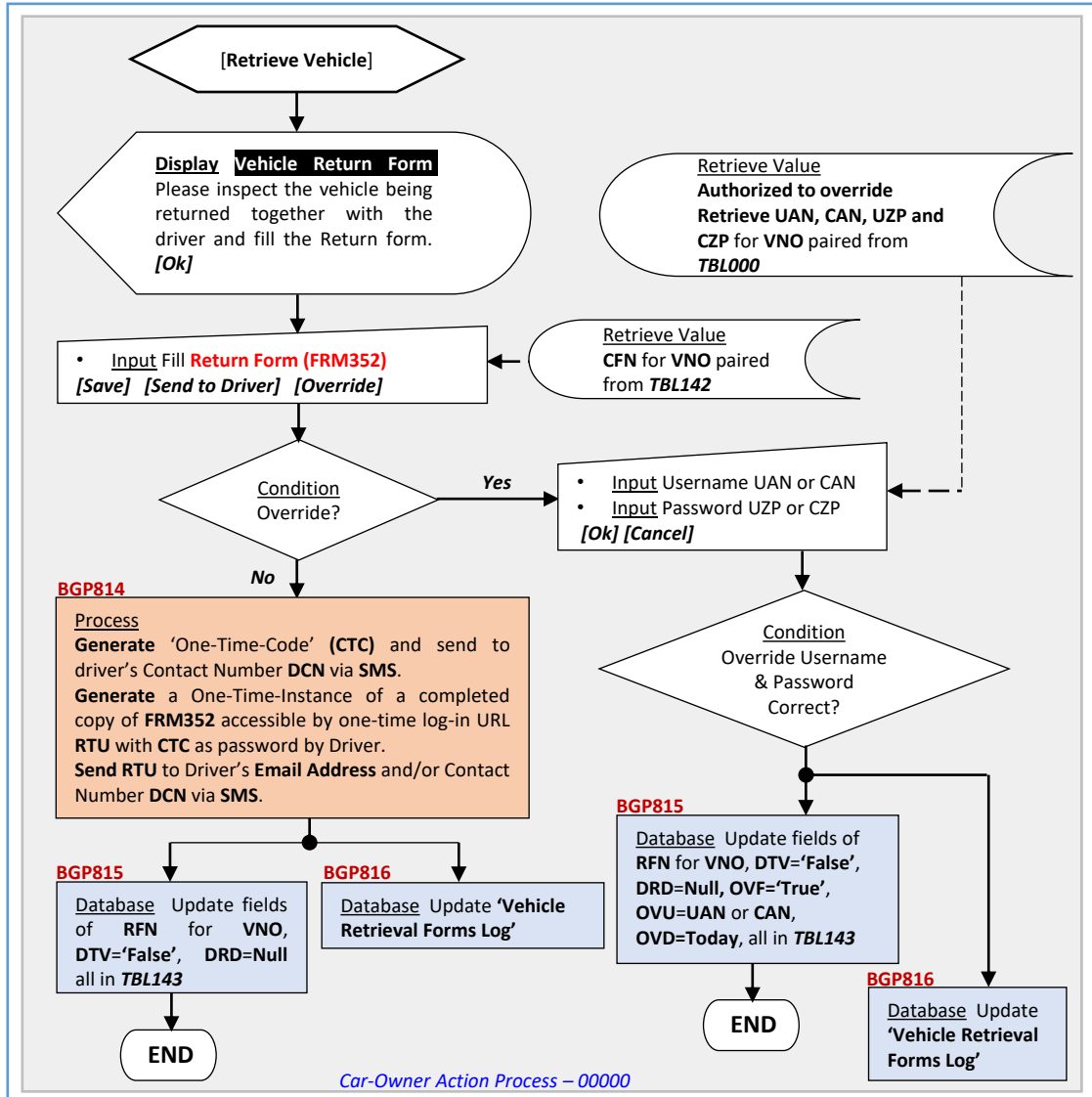


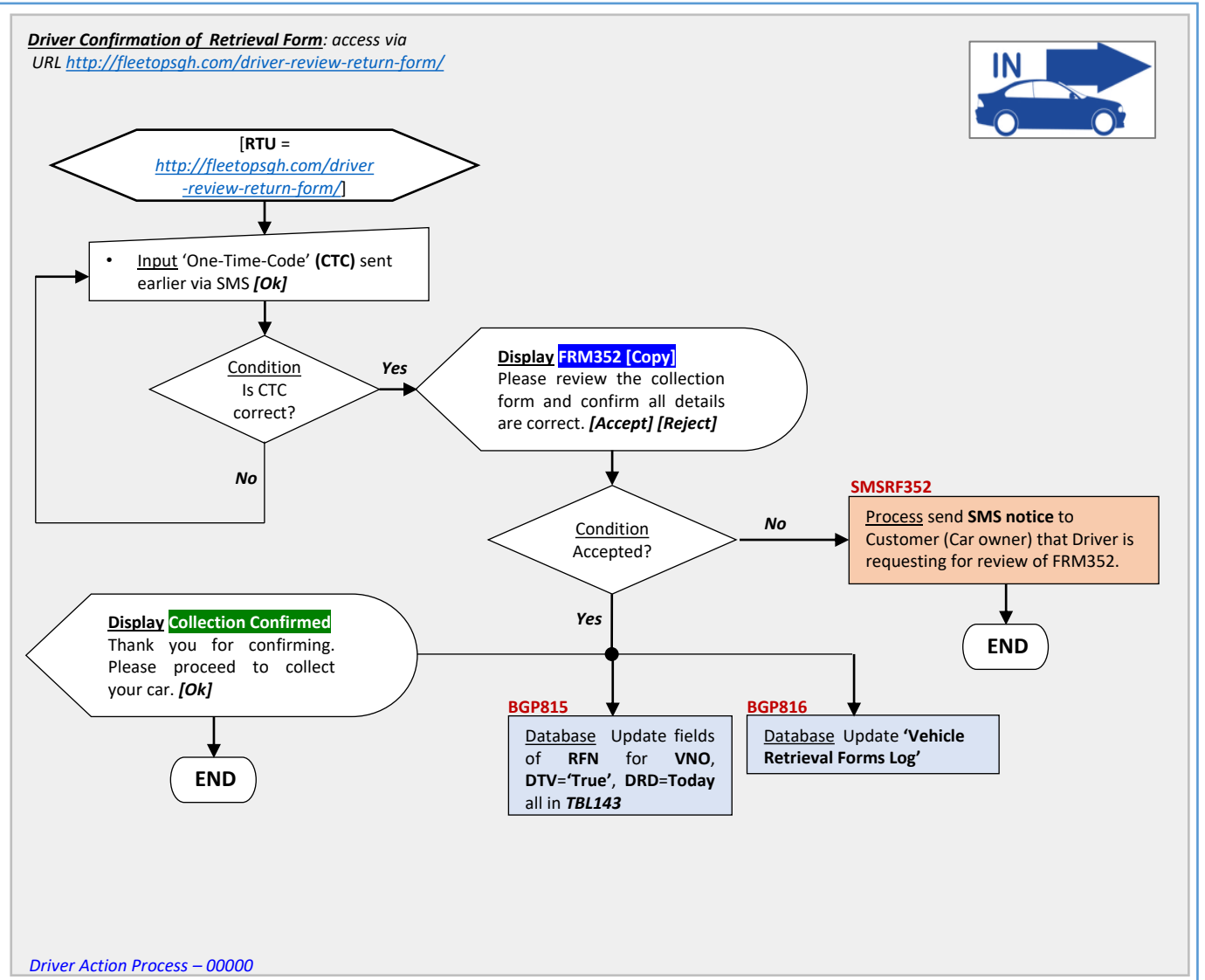
System Flowchart : **'Assign Vehicle/Driver'** – Client Vehicle Assign / Unassign – Process(Driver Acknowledgement and Acceptance) – **Handing Over**





System Flowchart : **'Unassign Vehicle/Driver'** – Client Vehicle Assign / Unassign – Process(Driver Acknowledgement and Acceptance) - **Return**

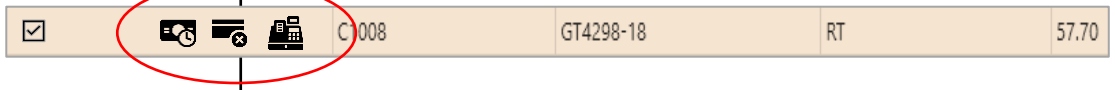




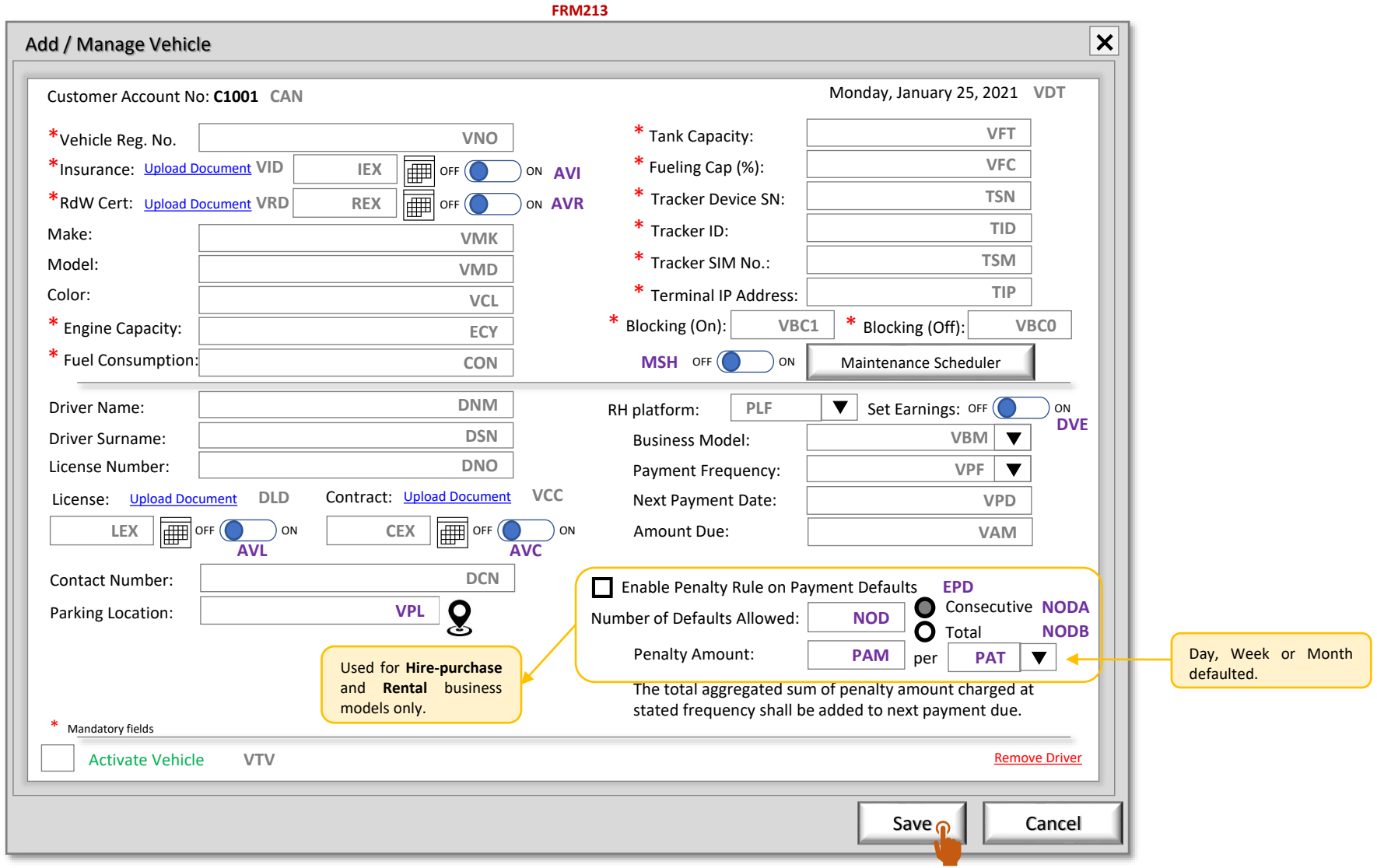
FLEET MANAGEMENT MODULE

PENDING PAYMENTS (PROCESS MODIFICATION)

System Flowchart (CS): **Pending Payments (Process Modification)**

	Feature	Background Description and Application	How it works
   	Pending Payments Modifications **Point-of-sale** **Cancel Payment** **Defer Payment**	The PCS system is heavily dependent on SMS and Mobile money for communication and business dealings with drivers. In the event where a Telco's mobile money system goes down for long periods and beyond 12:00 noon, and where drivers are not able to make payments, there could be a mass disablement or blocking of the vehicles at no fault of theirs: this is a potential business risk. Secondly, for the benefit of hire-purchase (HP) and rental (RT) customers (both are clients) we introduce the "deferred payment with penalty" option (EPD) so that in the event where they are unable to pay at 12pm on the exact day, the system will delay enforcement accordingly to the rule settings of the extended deadline. This modification seeks to enable the deferment, delay or extension of payment deadline, by an authorized user or rule settings. Once payment is due, delay or deferment cannot go beyond 6 hours extension on the due day; options would be 2Hrs, 4Hrs and 6Hrs deferment – For HP or RT with EPD set to "On" payment deferment would be with penalty and accordingly to the set rules. Third, in this modification we are introducing an alternative payment option, which is a manual point-of-sale, as well as the option to cancel payment altogether. This modification should be applicable for all business models. The proposed modification would impact how the workflow and current payment systems operate. In the event of payment deferment without EPD option, and where that action needs to be applied to many drivers at a time, a group action feature must be implemented i.e., the affected grids must have checkboxes with "Apply All" option. **Design example**  This modification may affect the following processes: - ***Workflow (06):*** Dependent on payment resolution. - ***Background processes in SA-PCS3:*** Integration of manual POS. - ***EXETR01:*** Integration of deadline extension of up 6hrs, in steps of 2 hrs. **Reports** - ***Cash-at-hand Report:*** with the introduction of a manual point-of-sale, physical cash accumulates in the hands of the cashier. This report provides the summary of physical cash collected from drivers. It would appear under the **"Accounting"** menu item, which is now a new menu group. A cash hand-over point shall be created to ensure transfer of bulk cash from cashier to a receiving point. Select the best processes, here. (TBD).	The "Pending Sales (RT/HP)" and "RH Daily Report" pages shall become the focal points for this modification. Three action icons shall be added to each pending sale item in the grid. While default payment method is mobile money, the alternate manual payment option should be by point-of-sale. The pending sale item can also be cancelled or delayed. A general point of sale button would be displayed on the page to facilitate general non-scheduled payments. Payment options would be Mobile money or cash. Entries made here would generate an invoice that registers in the "Pending Sales (RT/HP) grid. Payment is then completed by the driver through the usual means. 1. Collection note deadline extension: In the current operation, at 12pm, all vehicles with pending payments are blocked. With the "Deferred Payment" option, the collection note deadline can be extended by 2Hrs, 4Hrs and 6Hrs (max). This action should also be activated for a group of pending sales selected via checkboxes. For RT/HP whose "deferred payment with penalty" option (EPD) is turned on, this takes precedence over the delayed payment option. 2. Manual payment with POS: This opens a "checkout" window (invoice) of the pending sale item for payment to be completed via manual POS and generates a receipt. 3. Cancel Payment: The "Cancel Payment" is a Manager only action (To be discussed). The reason for cancellation must be stated and can only be done with the entry of a username and password. **Connection With Workflow** Whereas, currently, when workflow is resolved, this action automatically cancels the payment due altogether, in this modification, Workflow is no longer resolvable if payment is pending. The resolvability of the Workflow would now depend on the payment status. Workflow can only be resolved by unblocking the vehicle when Payment has been made manually through POS or has been cancelled, at the "Pending Sales (RT/HP)" and "RH Daily Report" levels. **Group Action** From the "Pending Sales (RT/HP)", "RH Daily Report" and "Workflow" grids, shall have added "check boxes" to enable the selection of multiple vehicles for which the "Deferred Payment" and "Unblocking" actions can apply, respectively. **General Ledger Records** The deferred payment of a collection note should not affect the ledger. When payment is eventually done, it is recorded accordingly. ***For Manual Payment (POS):*** DATE=/, DEC NO=/, CAN=/, VBM=/, CONTACT#=/, RECEIPT NO=/, AMOUNT =/, OPERATOR=UAN or CAN, TRAN#=Generate Unique Number, STATUS="Manual POS", SOURCE=/, REQUEST TIME=/, RESPONSE TIME=Null ***For Cancelled Payment:*** DATE=/, DEC NO=/, CAN=/, VBM=/, CONTACT#=/, RECEIPT NO=Null, AMOUNT =/, OPERATOR=Null, TRAN#=Null, STATUS="Cancelled", SOURCE=UAN (Managers only), REQUEST TIME=/, RESPONSE TIME=Null '=/' means the field maintains its originally designated values.

System Flowchart (CS): **Pending Payments (Process Modification)**



FLEET MANAGEMENT MODULE

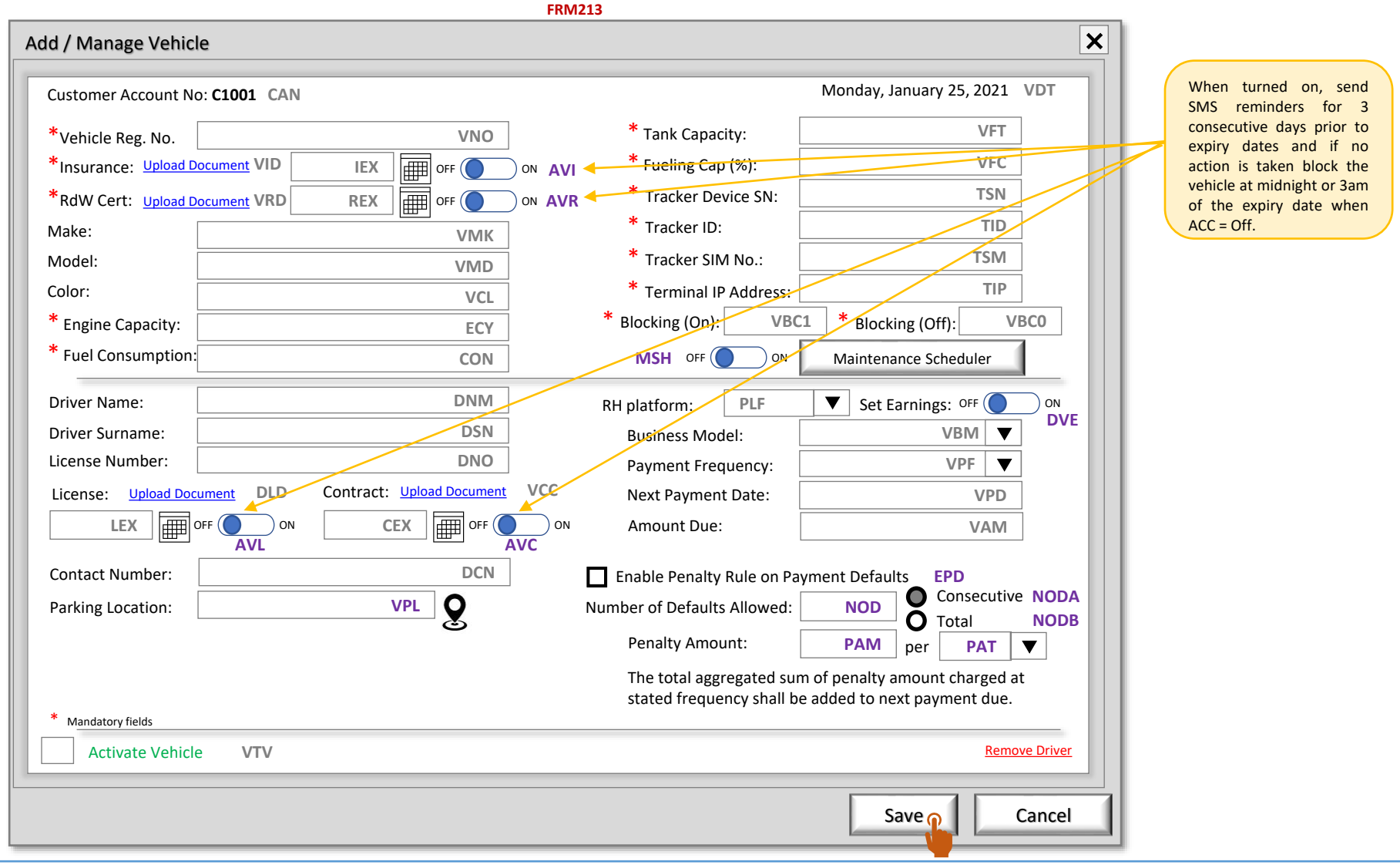
DRIVER MANAGEMENT RULES (PROCESS MODIFICATION)

Set “Immobilize vehicle” options on expiration of insurance, roadworthy certificate, driver’s license and driver contract

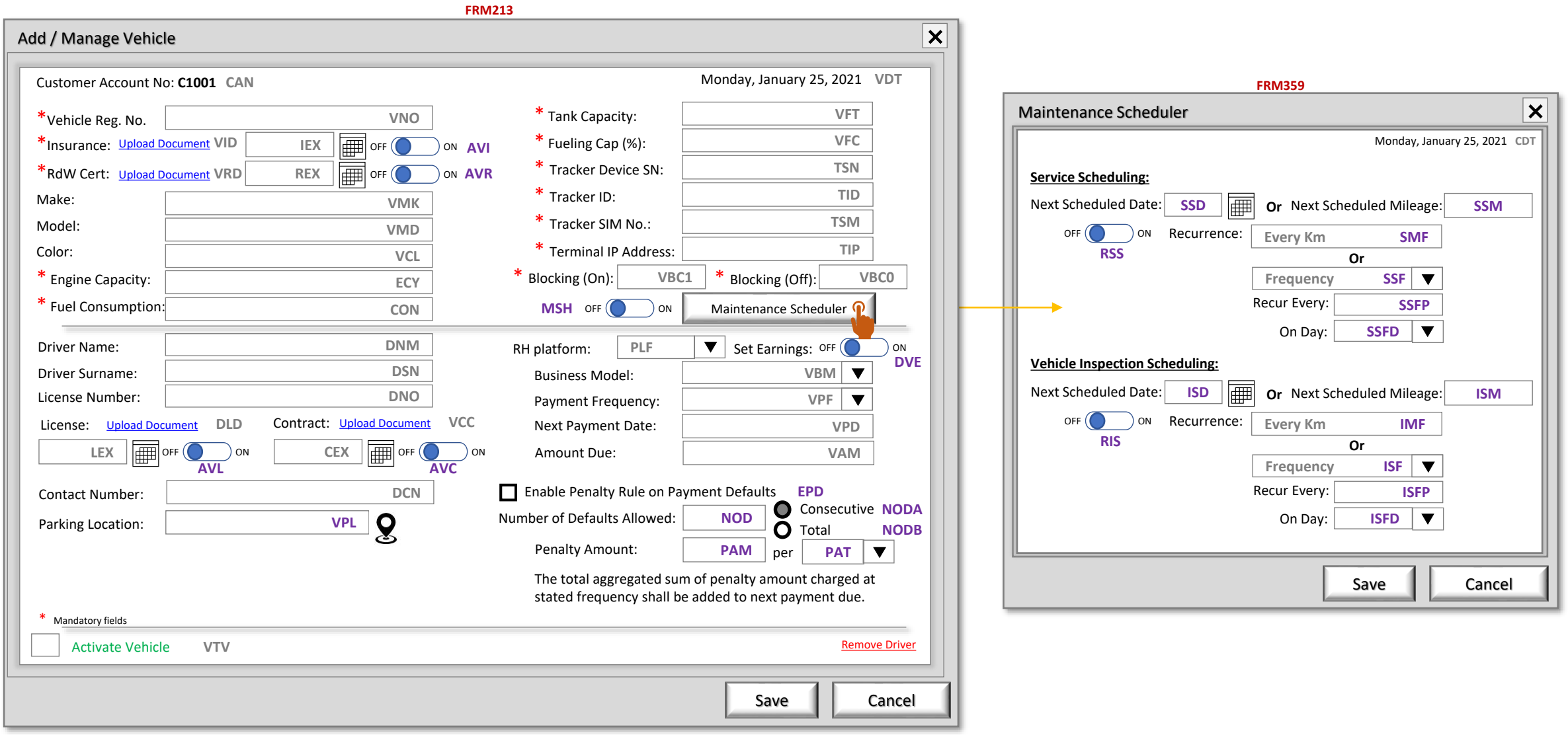
System Flowchart (CS): **Driver Management Rules (Process Modification) – Set "Immobilize vehicle" options on expiration of insurance, roadworthy certificate, driver's license and driver contract**

	Feature	Background Description and Application	How it works
	Set "Immobilize vehicle" options on expiration of **insurance**, **roadworthy certificate**, **driver's license** and **driver contract**. Set reminder options for **vehicle service due** and **vehicle inspection due**.	There are risks in driving a vehicle without valid documentations, when not serviced or when abused.; these risks are high and can damage or be costly to the business. Unfortunately, expiry dates are overlooked which can cause some serious legal, regulatory or technical issues. Hence, in order to ensure compliance with validations and necessary activities, the expiry dates of vehicle and driver documents shall be linked to the vehicle blocking (PCS) system. The maintenance/service and inspection due dates will follow the same reminder and notification processes, but the vehicle will NOT be blocked when deadlines are reached. Instead, the reminders would be persistent. This modification may affect the following processes: - ***Workflow (06):*** Will list blocked vehicles whose documents have expired. To unblock, renew documents, input new dates and upload document copies. **Reports** - ***Tasks:*** This report shall list all expiring or expired documents and activities in a grid for planning and resolving purposes. This report will be a menu item under the **"Operations"** main menu and would display two views; the first view would be called "**Pending Tasks"** and will have the features and functions to facilitate and resolve planning issues. The second view would be a historic of resolved tasks and by whom. It will be called **"Resolved Tasks"**. Please select the best options (TBD).	In the "Fleet Manager" Edit Page, it must be mandatory to input the expiry dates of the insurance and the roadworthy certificate. In the "Manage Driver" Edit Page, it must be mandatory to input the expiry dates of the driver's license and the contract. In a task report, the grid will display all upcoming tasks. 2 weeks or 14 days before expiry of any document or activity, the information must feature in the grid with an action to renew or complete. The client and the driver will be sent 3 SMS to inform (14 days to expiry), to remind (7 days to expiry) and finally to warn (1 day to expiry). If no action is taken then on the midnight or at 3am of expiry date, the vehicle must be blocked i.e., immobilized. Immobilized vehicles will go into workflow for resolving. For the expiring or expired documents, the **resolving action** is to input the new expiry dates of the renewed document and upload a snapshot or copy. If resolving action is done before expiry from the tasks grid, then blocking and workflow is avoided. But when to be done after expiration date, then the task must be resolved from workflow in order to unblock the vehicle. The **renewal action sequence** is initiated by driver, client or manager who log into their respective accounts to resolve the tasks. If initiated by the driver, then the information must be verified by the client or manager before renewal action is completed. (See workflow design D01 – D04). The **maintenance/service and inspection** due tasks are also managed from the "Fleet Manager" Edit Page from a special modal view called a scheduler. The purpose of a scheduler is to enable tasks to be rescheduled repetitively based on certain conditions such specific dates, days of the week or month, or based on amount of mileage driven. (See workflow design D05, D06).

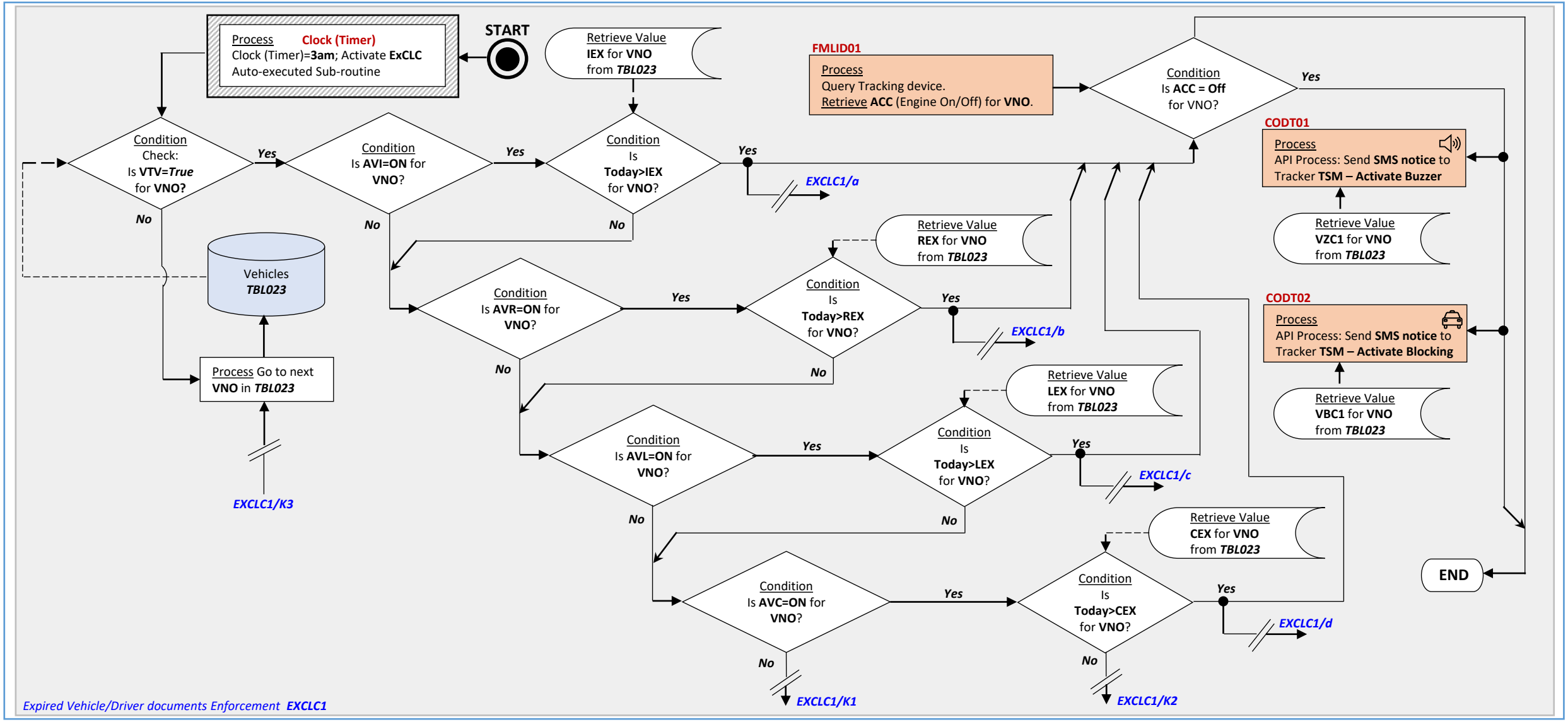
Mockup Design: '**Add/Manage Vehicle/Driver**' – Manager / Master Window View



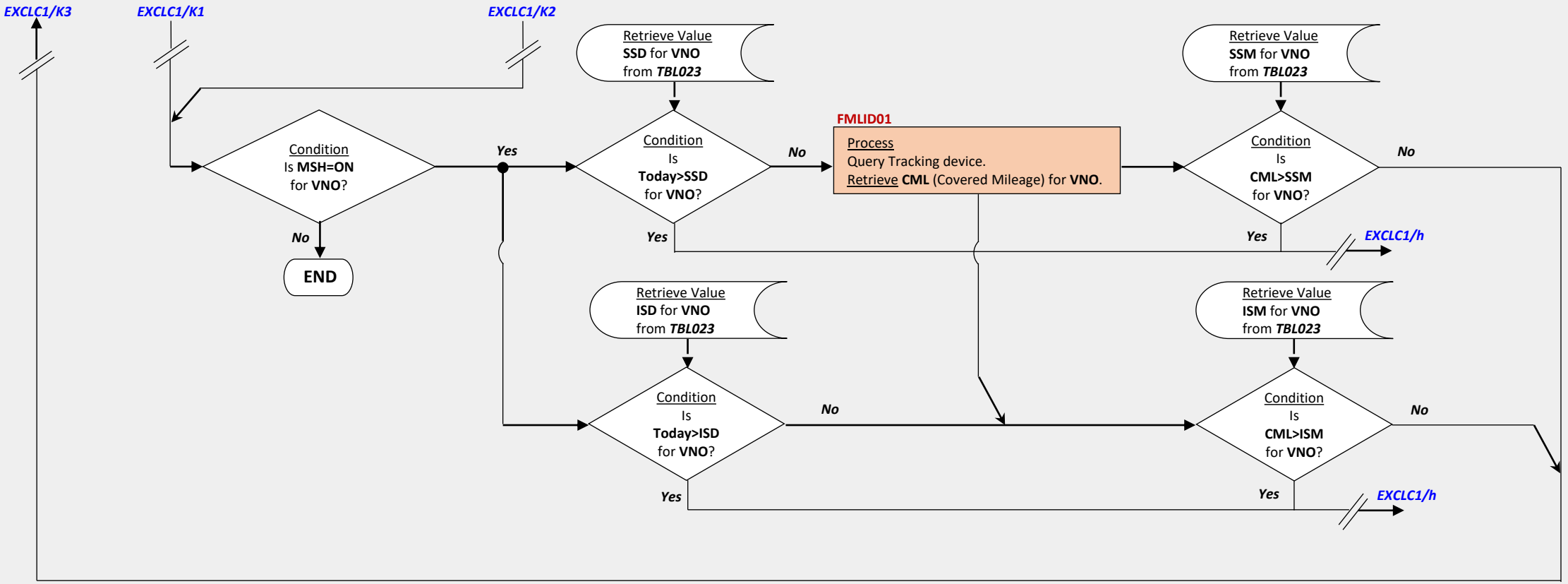
Mockup Design: '**Add/Manage Vehicle/Driver**' – Manager / Master Window View



System Flowchart : '**Add/Manage Vehicle/Driver'** – Manager / Master Window View (**Priority Tasks:** Renewal of Certificates, Licenses, Contracts, maintenance and Inspection – **ExCLC1** System)

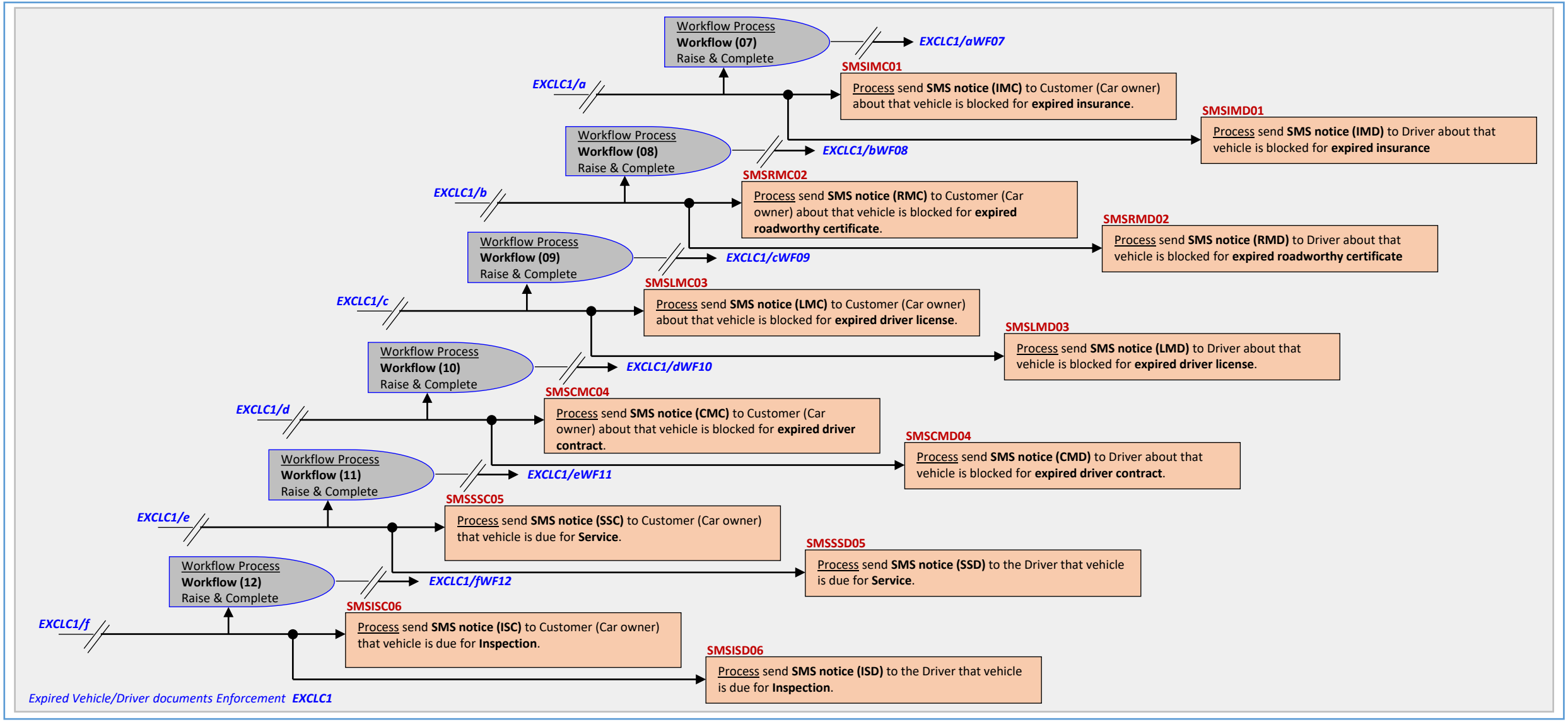


System Flowchart : '**Add/Manage Vehicle/Driver'** – Manager / Master Window View (**Priority Tasks:** Renewal of Certificates, Licenses, Contracts, maintenance and Inspection – **ExCLC1** System)



Expired Vehicle/Driver documents Enforcement ***EXCLC1***

System Flowchart : '**Add/Manage Vehicle/Driver'** – Manager / Master Window View (**Priority Tasks:** Renewal of Certificates, Licenses, Contracts, maintenance and Inspection – **ExCLC1** System)

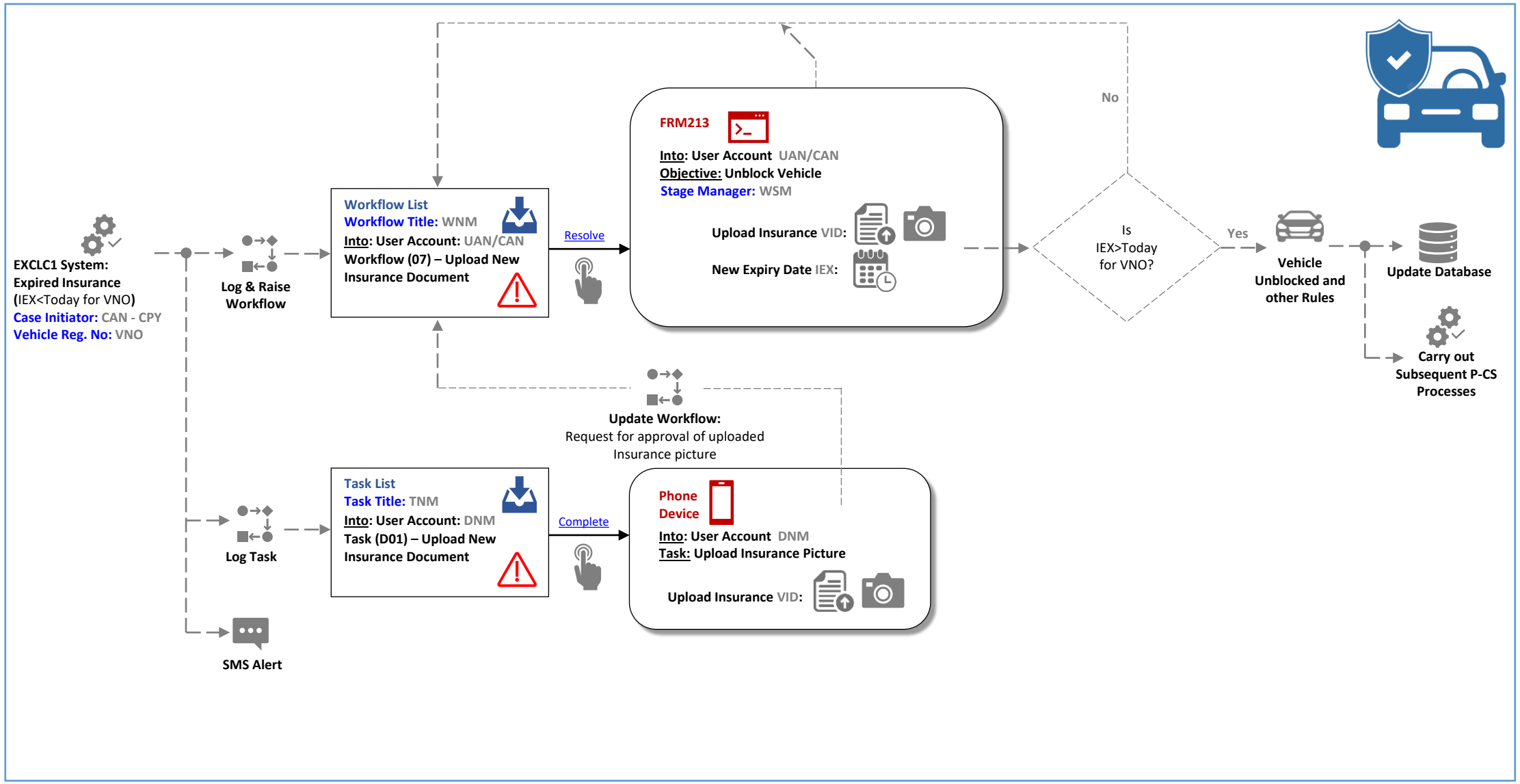


System Flowchart : '**Add/Manage Vehicle/Driver'** – Manager / Master Window View / SMS Wording List (**ExCLC1** System)

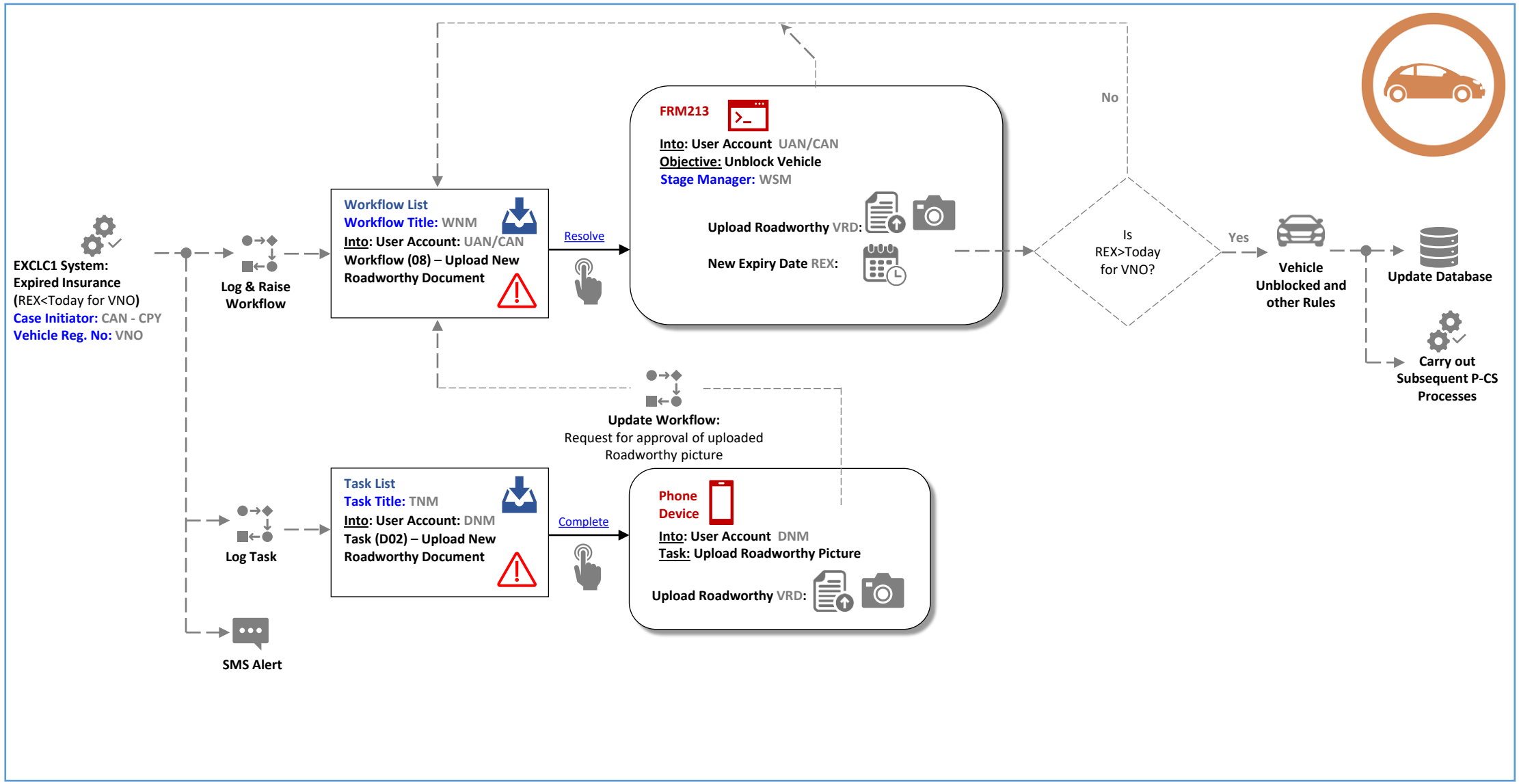
SMS ID	Text
SMSIMC01	Hi **'CZN'**, your vehicle with registration no. **'VNO'** has been blocked for **expired insurance** at your request. 3 reminders were sent earlier on but no action was taken. To unblock the vehicle, please renew the **insurance** and load new document on the FOVCOLLECTOR2.1 platform to restore service. Thank you.
SMSIMD01	Hi **'DNM'**, your vehicle with registration no. **'VNO'** has been blocked for **expired insurance** at your vehicle owner's request. 3 reminders were sent earlier on but no action was taken. Contact the vehicle owner immediate for the process to be followed to restore service. Thank you.
SMSRMC02	Hi **'CZN'**, your vehicle with registration no. **'VNO'** has been blocked for **expired roadworthy certificate** at your request. 3 reminders were sent earlier on but no action was taken. To unblock the vehicle, please renew the **roadworthy certificate** and load new document on the FOVCOLLECTOR2.1 platform to restore service. Thank you.
SMSRMD02	Hi **'DNM'**, your vehicle with registration no. **'VNO'** has been blocked for **expired roadworthy certificate** at your vehicle owner's request. 3 reminders were sent earlier on but no action was taken. Contact the vehicle owner immediate for the process to be followed to restore service. Thank you.
SMSLMC03	Hi **'CZN'**, your vehicle with registration no. **'VNO'** has been blocked for **expired driver's license** at your request. 3 reminders were sent earlier on but no action was taken. To unblock the vehicle, please load the **renewed driver's license** on the FOVCOLLECTOR2.1 platform to restore service. Thank you.
SMSLMD03	Hi **'DNM'**, your vehicle with registration no. **'VNO'** has been blocked for **expired driver's license** at your vehicle owner's request. 3 reminders were sent earlier on but no action was taken. Please renew your license and contact the vehicle owner immediate for the process to be followed to restore service. Thank you.
SMSCMC04	Hi **'CZN'**, your vehicle with registration no. **'VNO'** has been blocked for **expired driver contract** at your request. 3 reminders were sent earlier on but no action was taken. To unblock the vehicle, please load the **renewed driver's contract** on the FOVCOLLECTOR2.1 platform to restore service. Thank you.
SMSCMD04	Hi **'DNM'**, your vehicle with registration no. **'VNO'** has been blocked for **expired driver contract** at your request. 3 reminders were sent earlier on but no action was taken. Contact the vehicle owner immediate for the process to be followed to restore service. Thank you.

SMS ID	Text
SMSSSC05	Hi **'CZN'**, your vehicle with registration no. **'VNO'** is due for **maintenance** at your request. 3 reminders were sent earlier on. Please carry out the scheduled **service** and update the FOVCOLLECTOR2.1 platform accordingly. Thank you.
SMSSSD05	Hi **'DNM'**, your vehicle with registration no. **'VNO'** is due for **maintenance** at your car owner's request. 3 reminders were sent earlier on. Contact the vehicle owner immediately for the process to be completed accordingly. Thank you.
SMSISC06	Hi **'CZN'**, your vehicle with registration no. **'VNO'** is due for **inspection** at your request. 3 reminders were sent to you and to your driver earlier on. Please carry out the scheduled **inspection** and update the FOVCOLLECTOR2.1 platform accordingly. Thank you.
SMSISD06	Hi **'DNM'**, your vehicle with registration no. **'VNO'** is due for **inspection** at your car owner's request. 3 reminders were sent to you and to your car owner earlier on. Contact the vehicle owner immediately for the process to be completed accordingly. Thank you.

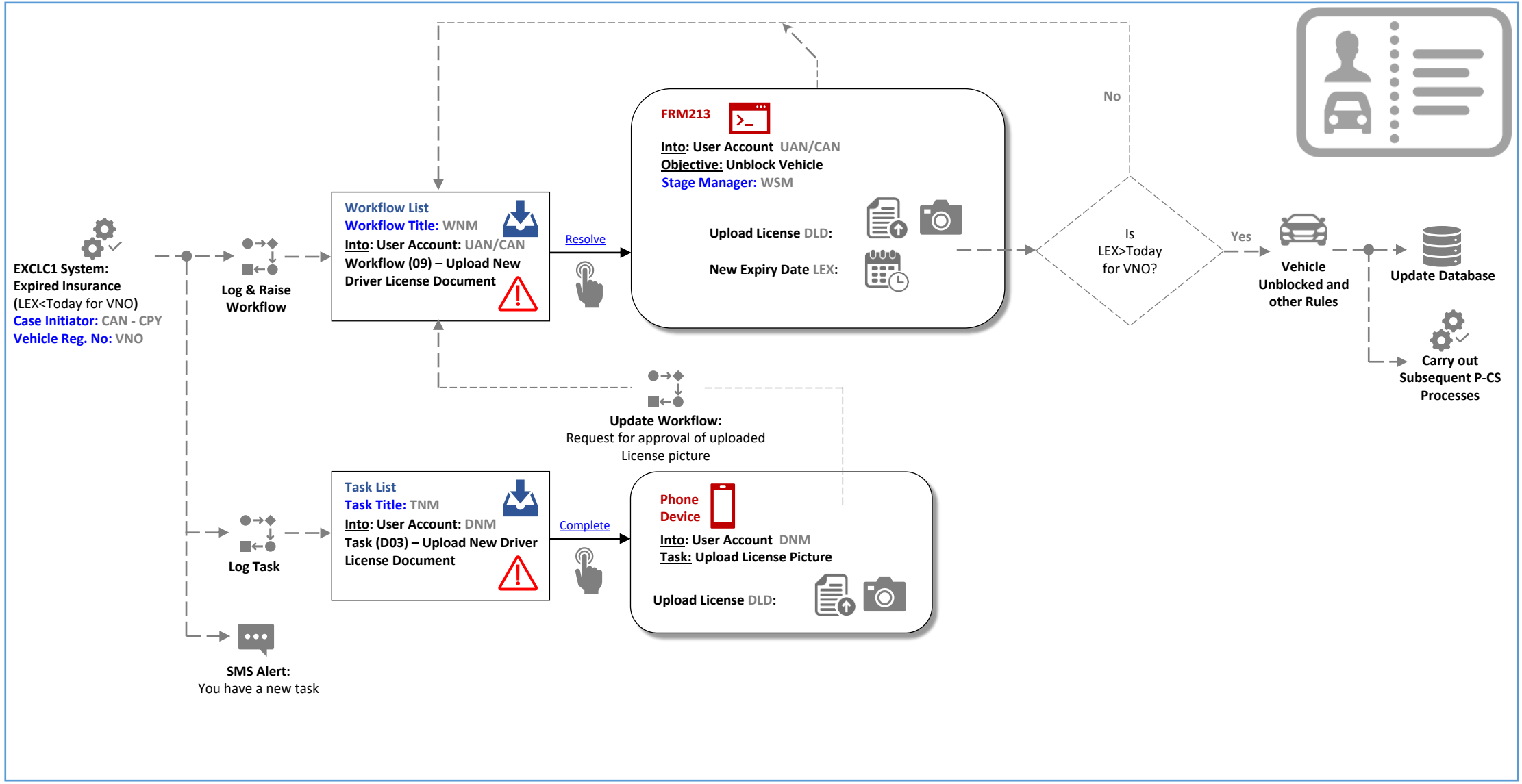
Workflow Design: **EXCLC1 System (Priority Tasks:** Update Vehicle Insurance Certificate Details**) Workflow (07) / Task (D01)**



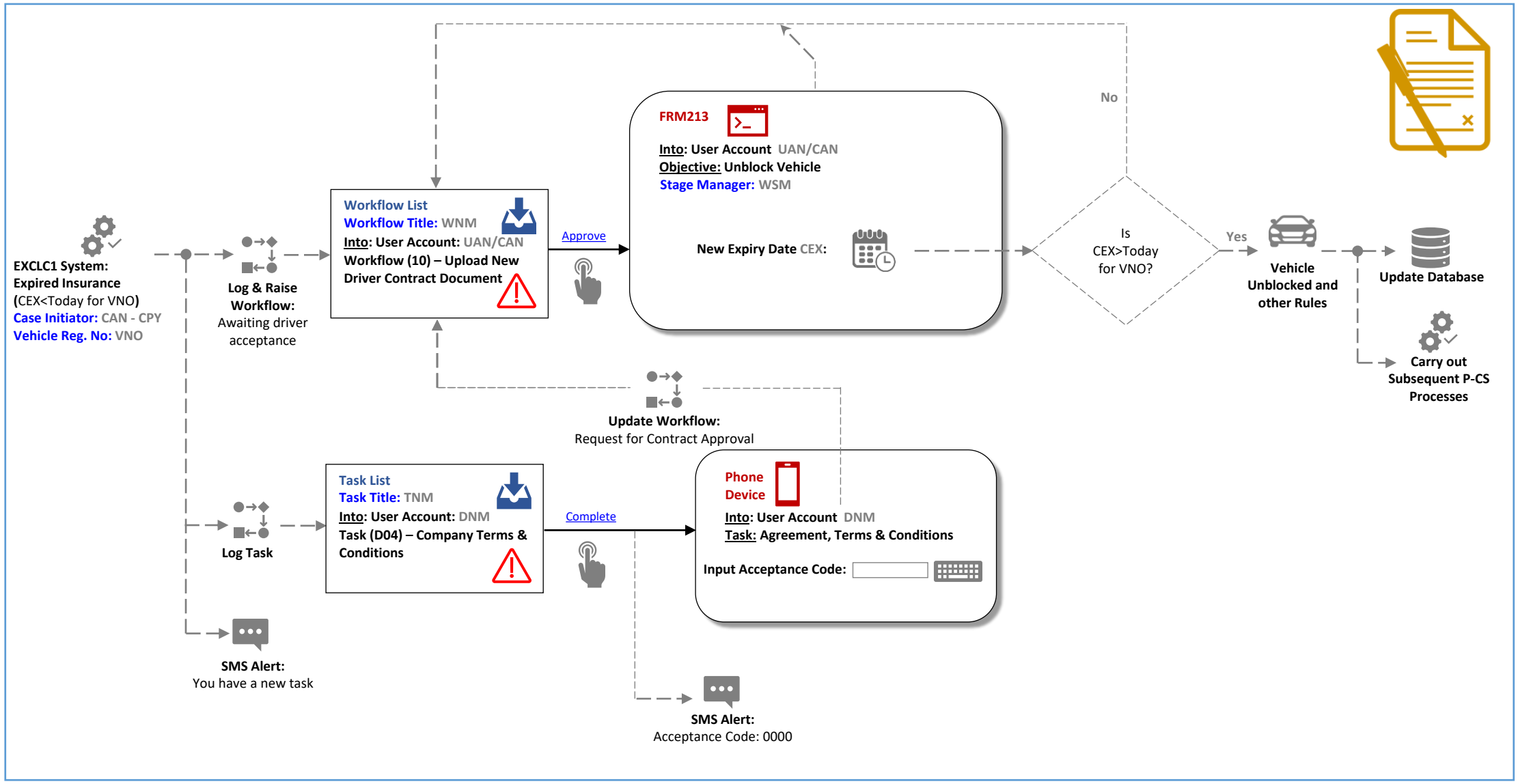
Workflow Design: **EXCLC1 System (Priority Tasks:** Update Vehicle Roadworthy Certificate Details**) Workflow (08) / Task (D02)**



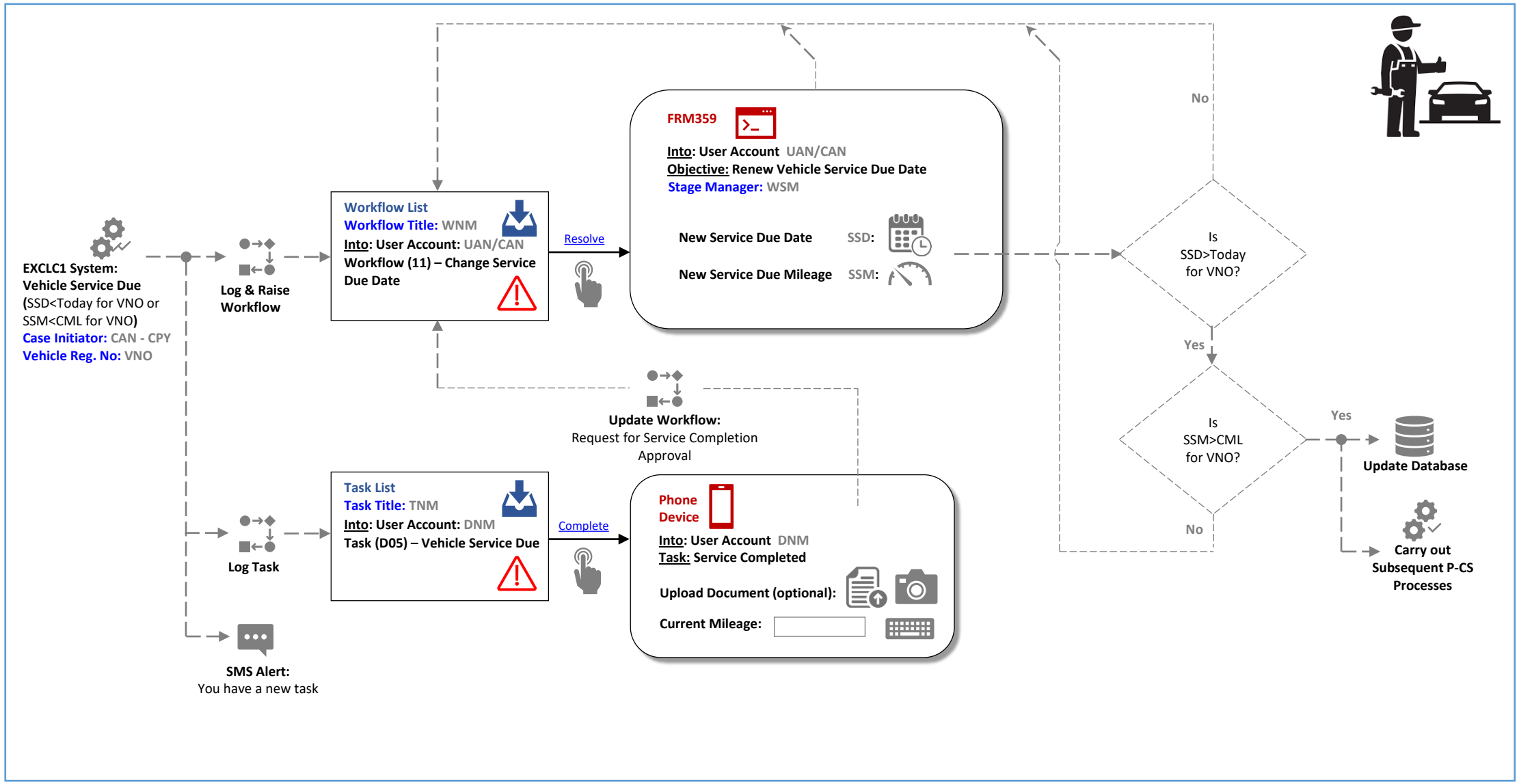
Workflow Design: **EXCLC1 System (Priority Tasks:** Update Driver License Details**) Workflow (09) / Task (D03)**



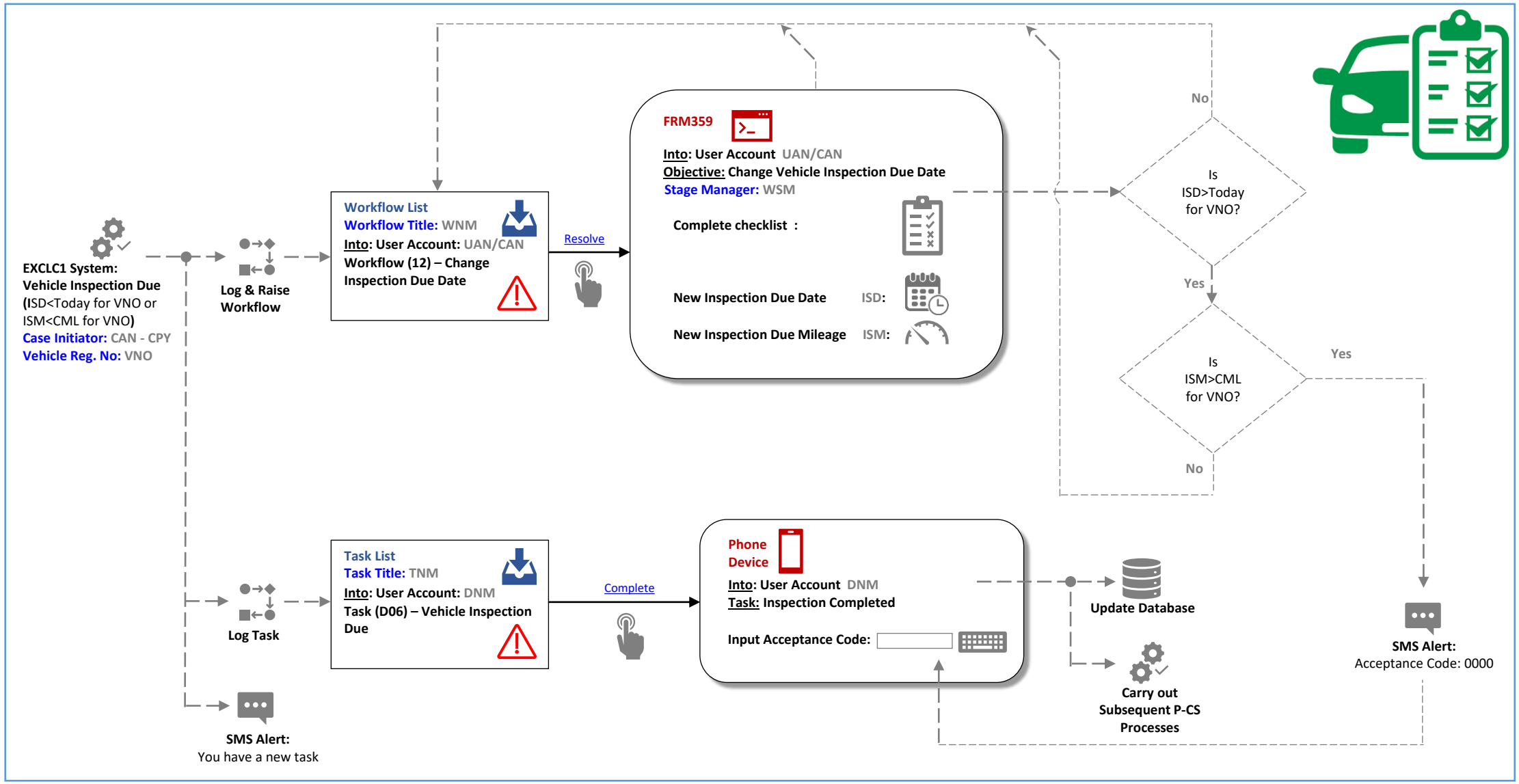
Workflow Design: **EXCLC1 System (Priority Tasks:** Update Driver Contract Details**) Workflow (10) / Task (D04)**



Workflow Design: **EXCLC1 System (Secondary Tasks:** Update Vehicle Service Details**) Workflow (11) / Task (D05)**



Workflow Design: **EXCLC1 System (Secondary Tasks:** Update Vehicle Inspection Details**) Workflow (12) / Task (D06)**



Mockup Design: **EXCLC1 System (Secondary Tasks:** Update Vehicle Inspection Details **) Vehicle Inspection List**

FRM386

Vehicle Inspection Form

Vehicle Reg. No.: VNO

Vehicle Chassis No.: VCN

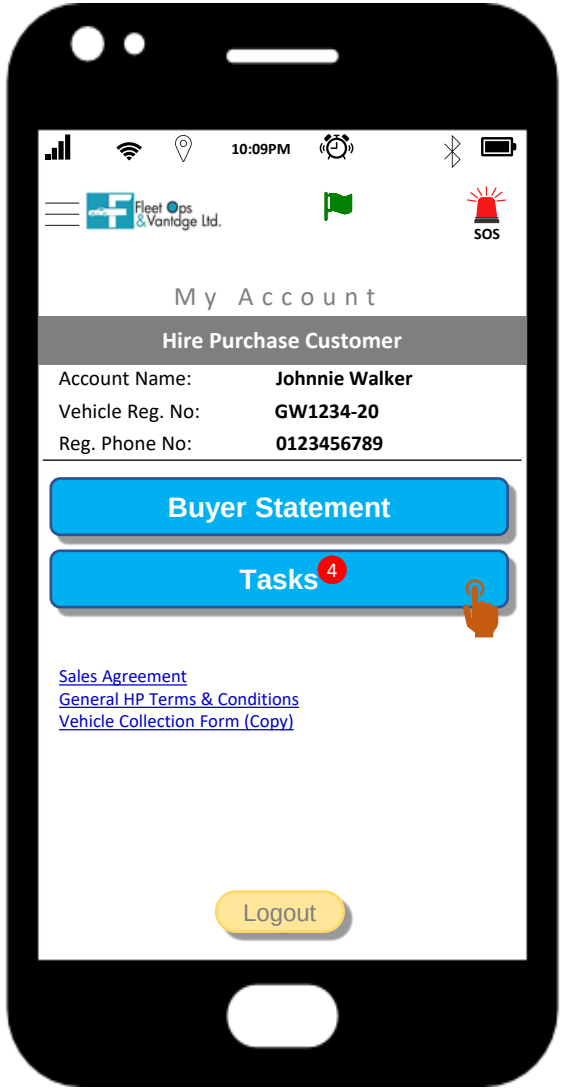
Monday, January 25, 2021 CDT

1. Look under the car for leaks:	VI01	Yes	No	CI01
2. Check radiator coolant level:	VI02	Yes	No	CI02
3. Check engine oil level:	VI03	Yes	No	CI03
4. Check brake fluid:	VI04	Yes	No	CI04
5. Check windshield washer fluid:	VI05	Yes	No	CI05
6. Check battery condition:	VI06	Yes	No	CI06
7. Check general cleanliness of engine:	VI07	Yes	No	CI07
8. Check tire condition, caps, nuts and tools:	VI08	Yes	No	CI08
9. Check brakes (Foot/Hand Brakes):	VI09	Yes	No	CI09
10. Check inside mirror and side mirrors:	VI10	Yes	No	CI10
11. Check all windows left/right windows:	VI11	Yes	No	CI11
12. Check doors, handles, boot and hood:	VI12	Yes	No	CI12
13. Check headlights, brakes lights:	VI13	Yes	No	CI13
14. Check ignition key and system:	VI14	Yes	No	CI14
15. Check steering wheel	VI15	Yes	No	CI15
16. Check dashboard indicator lights:	VI16	Yes	No	CI16
17. Check inside lights:	VI17	Yes	No	CI17
18. Check radio and CD player/antenna	VI18	Yes	No	CI18
19. Check seat belts and seat covers:	VI19	Yes	No	CI19
20. Check cleanliness of the vehicle's interior:	VI20	Yes	No	CI20
21. Check first aid kit and fire extinguisher:	VI21	Yes	No	CI21
22. Check reflective triangles:	VI22	Yes	No	CI22
23. Check validity of insurance (Sticker):	VI23	Yes	No	CI23
24. Check validity of Roadworthy (Sticker):	VI24	Yes	No	CI24
25. Physical Dents & Damages (Pictures)	VI25			

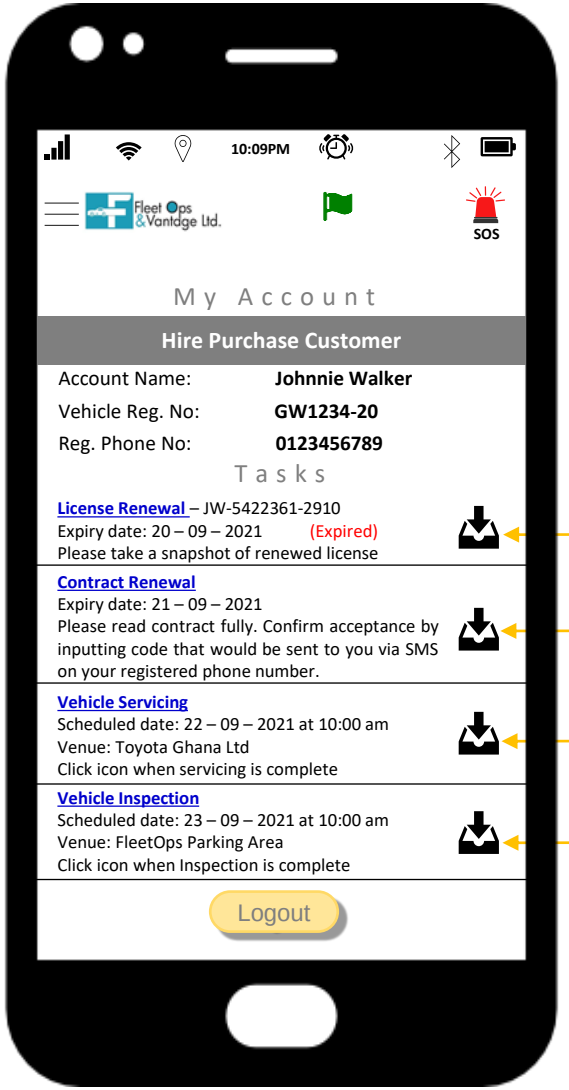
Save Cancel

Mockup Design: **Driver Account – Tasks**

SCRNB474-HP/RT/RH



SCRNB475-HP/RT/RH



Snapshot of article format or uploading scanned document to be used for driver renewal action of **license**, **roadworthy certificate** and **insurance**.

Simultaneously display full contract and send SMS code to driver phone when clicked. At the end of the contract driver can input code to confirm acceptance.

Snapshot of article (can be used optionally) or uploading scanned document and text area for inputting vehicle mileage.

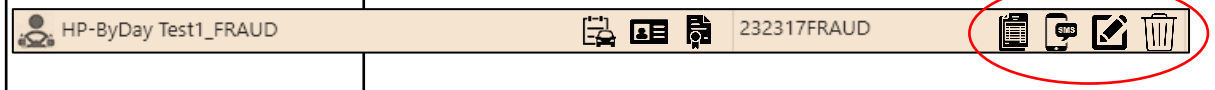
Text input area for inputting acceptance code.

FLEET MANAGEMENT MODULE

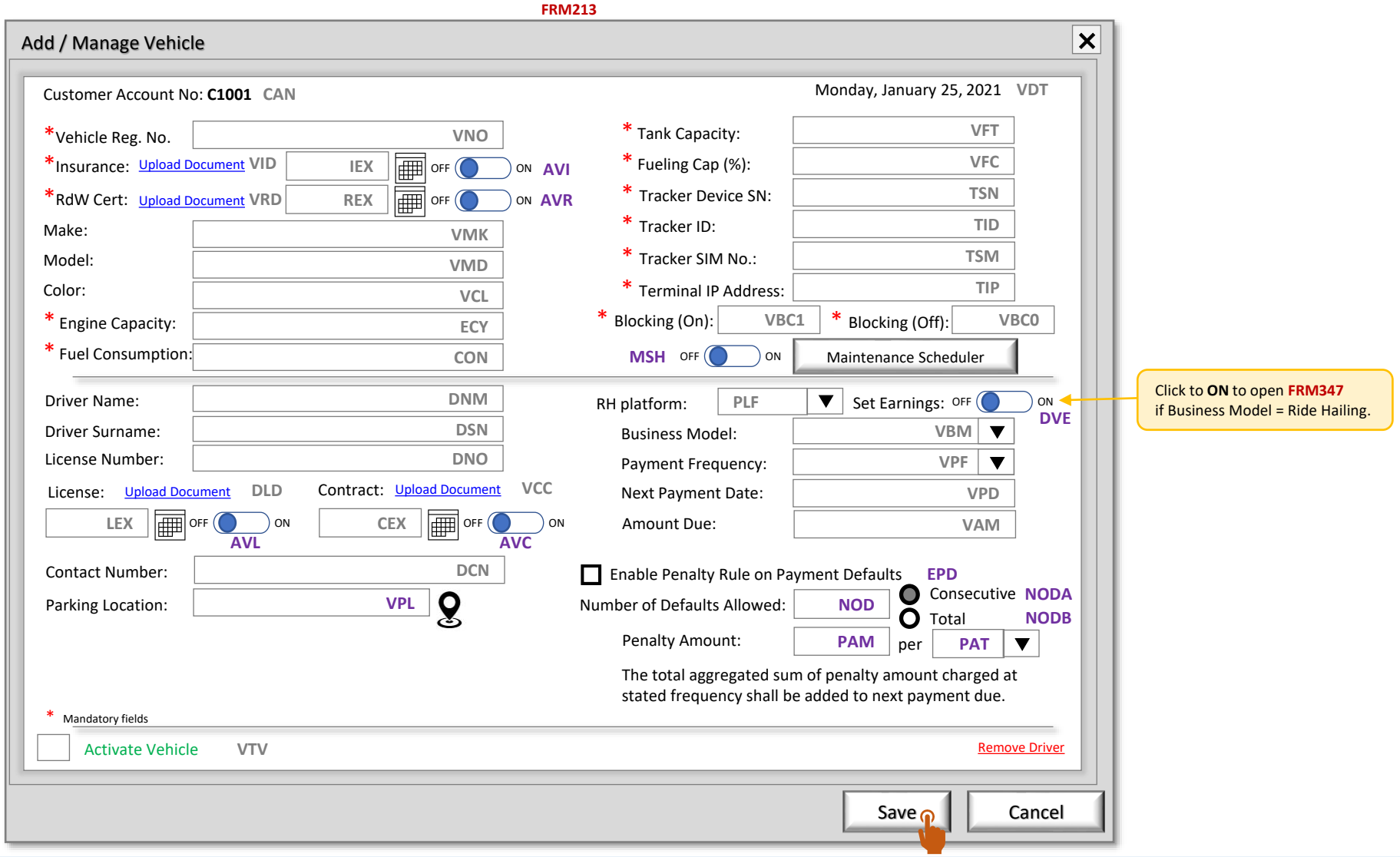
DRIVER MANAGEMENT RULES (PROCESS MODIFICATION)

Set Ride-Hailing business model driver earning options

System Flowchart (CS): **Driver Management Rules (Process Modification) – Set Ride-Hailing business model driver earning options**

	Feature	Background Description and Application	How it works
	1. Set Ride-Hailing business model driver earning options **Driver Statement** **Business Summary SMS (For all businesses)**	In Ride-Hailing business model, the driver is either an employee or an independent contract who performs work on behalf of the client and in return receives a remuneration (Salary) at the end of the period selected or agreed with their employer (client). The driver "Salary" or Total Earning is a combination of a principal earning [PRINC] and a bonus [BONUS]. The principal earning is either a fixed amount or a percentage of total sales or net-of-earning made for that period. The bonus is a percentage of an achieved sales amount in excess of a target amount. Since the driver would be operating mostly remotely, the introduction of an **e-wallet** would be to facilitate the payment of driver remunerations and other monies to be used for work. The e-wallet shall be a standard debit and credit account with features for cash transfer to mobile device. It would store the user data and all historic of transactions made. From this e-wallet the client can also transfer cash to be used for the purchase of fuel or other items necessary for business work. At his own time, the driver can "withdraw" the cash which is simply an electronic transfer of e-cash from this e-wallet to his mobile wallet. **Reports** - ***Central Wallet Activity:*** This report heading would be a sub-menu item that appears under the **"Accounting"** main menu item and shall list all transaction activities (debits or credits), of all natures and from all drivers in the dated and timed sequence in which they appear. "Accounting" is a new main menu group. **Design example**  For business summary SMS use the logo on the left instead of text.	For all successful cash declarations by the driver, the remuneration (TERN) gets calculated automatically and transferred to his e-wallet where cash can be withdrawn later. The cash transfer feature of the DREAMOVAL system shall be used to facilitate the withdrawal process. **NB: Only Positive TERN can be withdrawn.** E-wallet Actions: Withdraw cash (Transfer to mobile wallet) To withdraw cash, the driver logs into their account and then click "Withdraw Cash". This action displays empty text box where the phone number of the mobile wallet into which the cash must be transferred is inputted. An OTP (One-time-pin) is sent to only the registered number of the driver on file with company and / or email address. When input, this action is then completed, and e-cash is transferred to mobile wallet. E-wallet Account Items 1. Credit Items - Salary (From TERN) - Fuel (From FTP) 2. Debit Items - Cash Withdrawal (Transfer to mobile wallet) From the "Manage Driver" page, the **Driver Statement** can be displayed. **For RH:** it displays the sales report, which is a full statement of all payments after declaring sales daily. It is also a history of how the vehicle was used and how much was derived from its use. It is also the transactional report showing the dated sequence of credits and debits activities on their e-wallet. Boldly at the top of the driver statement page is the driver details and the balance on his account. **For HP:** it displays the buyer statement, which is a full statement of all payments, and balance on vehicle purchase price to date. It is basically a history of all transactions and events that occur during the entire purchase agreement as it may record defaults, penalties, and even repossessions etc. **For RT:** it displays all payments made by the customer and their receipts numbers.
	2. RH – Missing CML readings due to tracker failure	In the event where the tracker fails to log CML and CHR, RH sales for that day could be lost as the RH report would show CML=0 and CHR=0 and there isn't any process to declare that day's sale.	During the BGP800 process, if tracker was offline, causing CML=0 and/or CHR=0, then the system must request for Workflow(05) automatically. In this case, as the driver initiates the sales declaration process, the system would process normally in the front-end but in the back-end since CML=0 and/or CHR=0, Workflow (5) is raised automatically to request for client or manager input for actual figures from the ride hailing dashboard. The remaining step continue as normal.

Mockup Design: '**Add/Manage Vehicle/Driver**' – Manager / Master Window View



Mockup Design: '**Add/Manage Vehicle/Driver'** – Manager / Master Window View (Set Ride-Hailing Driver Earning Options)

FRM347

Set Ride-Hailing Driver Earning Options

1. Driver Status:

☐ Employee DSE ☒ Independent Contractor DSI

2. Principal Earning:

◉ Fixed Earning: 0.00# Fixed Amount FPE — Fixed earning is paid at the designated frequency.

○ Performance Based Earning: 0.00% Percent PPE

...of Total Sales PPEA ◉

...of Net of Earning PPEB ○

Percentage Earning is calculated as the percentage of total sales or net-of-earning and paid as the aggregated sum at EPF frequency.

3. Performance Bonus:

☐ Performance in excess of achieved target: PTS

...of Total Sales. PTSA ◉

...of Net of Earning PTSB ○

Target amount: 0.00# Target Amount PBT

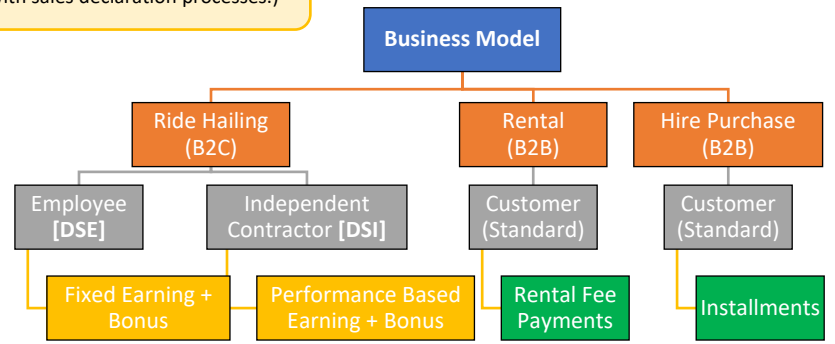
Percentage rewarded: 0.00% Percent PBP

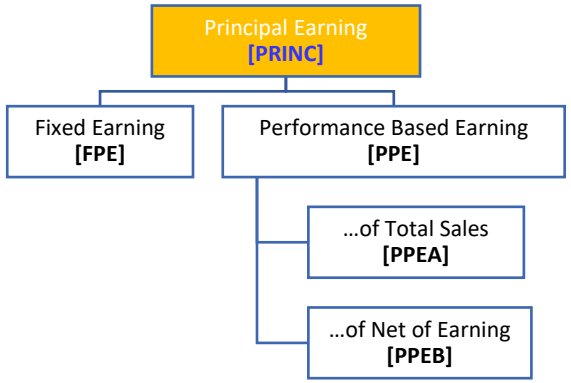
Performance Bonus is calculated as the percentage of any amount achieved in excess total sales or net-of-earning and paid as the aggregated sum in addition to Principal Earning at EPF frequency.

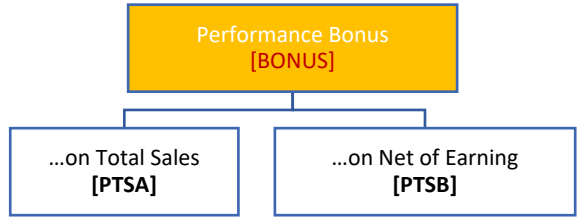
4. Earning Payment Frequency: EPF ▼ — Daily, Weekly or Monthly

Save Cancel

Earning Options (Earnings calculation is synchronized with sales declaration processes.)







$$\textbf{TOTAL EARNING}\ [\textbf{TERN}] = \textit{Principal Earning}\ [\textbf{PRINC}] + \textit{Performance Bonus}\ [\textbf{BONUS}]$$

$$\textbf{PRINC} = FPE \quad \textbf{or} \quad (PPEA \times PPE\%) \quad \textbf{or} \quad (PPEB \times PPE\%) \qquad \textit{Where,} \quad \textbf{PPEA} = \left(\sum SPF\right) \quad \textbf{or} \quad \textbf{PPEB} = \sum (SPF - Costs)$$

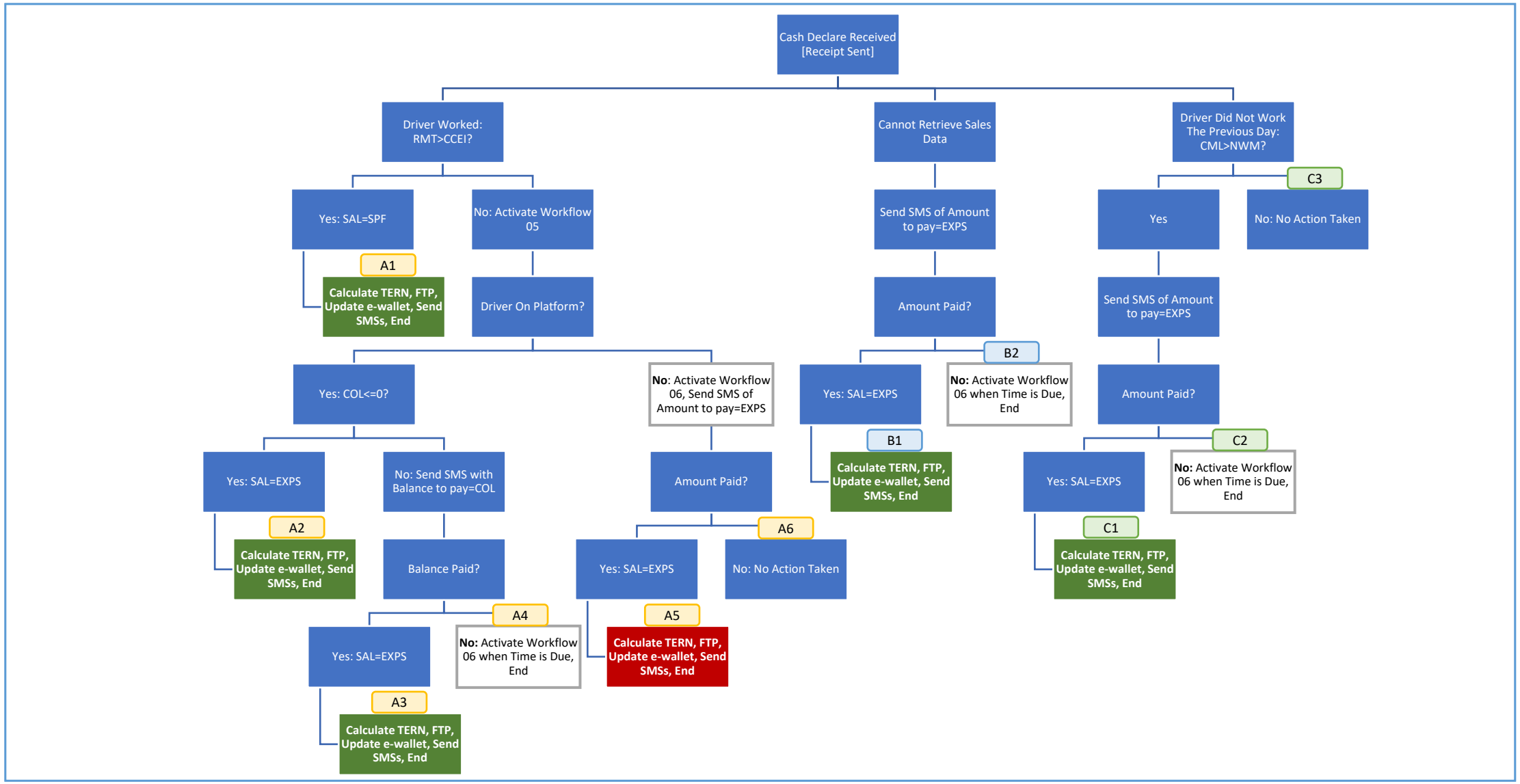
TOTAL EARNING is paid to driver contractor E-Wallet as remuneration for work completed.

Calculation is accomplished for **ONLY POSITIVE (+)** values of **BONUS**.

$$\textbf{BONUS} = [PTS - PBT] \times PBP\%$$

$$PTS = PTSA \quad \textbf{or} \quad PTSB \qquad \textit{Where,} \quad \textbf{PTSA} = \left(\sum SPF\right) \quad \textbf{or} \quad \textbf{PTSB} = \sum (SPF - Costs)$$

System Flowchart (CS): – **Cash Declaration Sequence**



FLEET MANAGEMENT MODULE

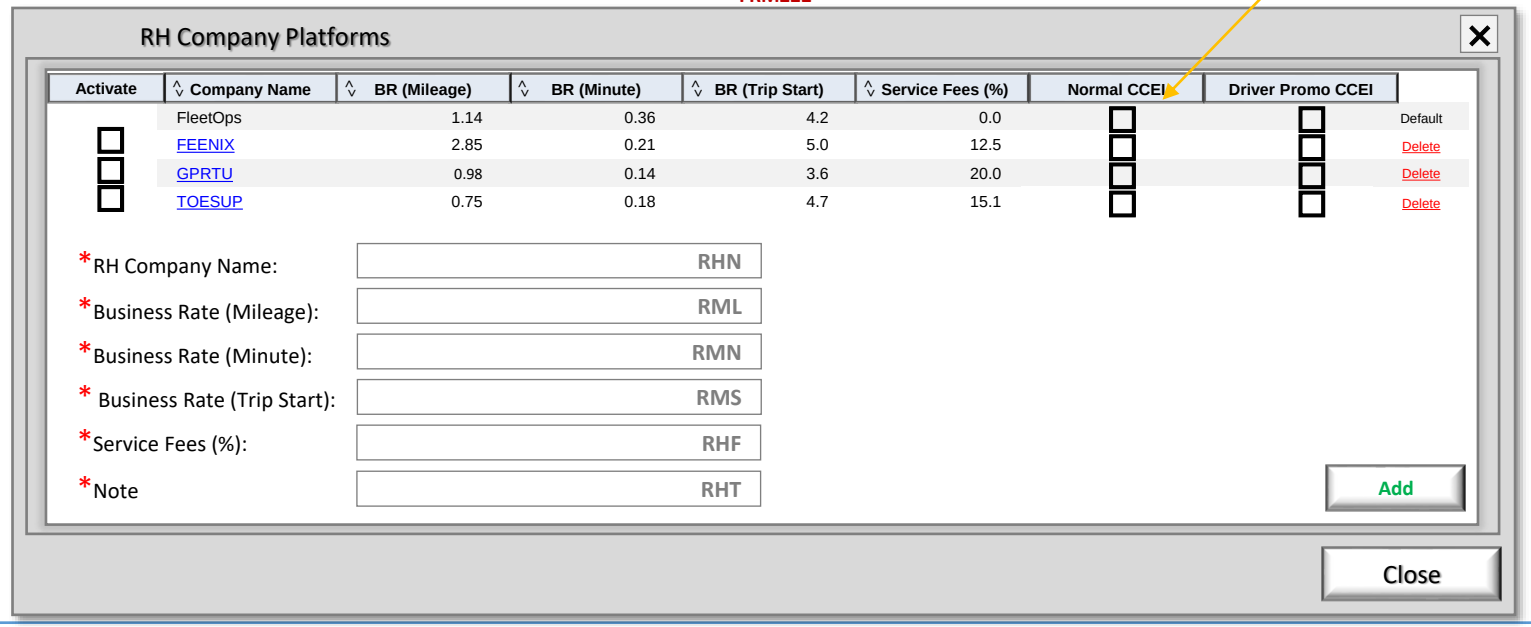
CCEI FORMULA SELECTION - NORMAL/DRIVER PROMO MODES (PROCESS MODIFICATION)

Mockup Design: – **CCEI Formula Selection – Normal/Driver Promo Mode (Process Modification)**

Name	Nomenclature	Units	Formulae
Expected Sales	**EXPS**	Ghc	$EXPS = [(CML \times RML) + (60 \times CHR \times RMN)] + (\text{TPF} \times \text{RMS})$ RML, RMN and RMS are picked up from Table ***TBL361***
Cash Collected Estimation Interval	**$CCEI_{(min)}$** **$CCEI_{(max)}$**	Ghc	$Y = (CCEI\_a \times EXPS) + CCEI\_b$ **Normal CCEI** $CCEI_{(min)} = Y - CCEI\_taSe \sqrt{CCEI\_n + \frac{(EXPS - CCEI\_Xb)^2}{CCEI\_Sxx}}$ **Driver Promo CCEI** $CCEI_{(max)} = Y + CCEI\_taSe \sqrt{CCEI\_n + \frac{(EXPS - CCEI\_Xb)^2}{CCEI\_Sxx}}$ CCEI_a, CCEI_b, CCEI_taSe, CCEI_n, CCEI_Xb, CCEI_Sxx values are picked up from Table ***TBL494***.

Cash collected depends on the season or the marketing promotion adopted by the ride hailing company. When the checkboxes are selected, the corresponding CCEI formula is used; either Normal CCEI or Driver Promo CCEI. They cannot both be selected. These formulae have their usual function in the P-CS system but this time only the selected one for that company is used to determine the amount of cash collected.

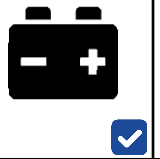
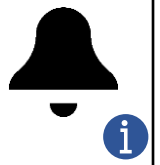
FRM222



FLEET MANAGEMENT MODULE

ALERTS (PROCESS INTEGRATION)

System Flowchart (CS): **New Alerts (Process Integration)**

	Feature	Background Description and Application	How it works
	Inconsistent parking detected *This alert must be acknowledged to be cleared off the chart.*	Before collecting the vehicle, the driver must declare his place of residence, and specifically where the vehicle will be parked. The geo-locations of the place is then logged in the system as **VPL**. This feature confirms that the vehicle is parked at the location that was initially agreed. If not, the alert is raised.	At a time (to decided), perhaps between 1 – 5 am, the software carries out a series of routine checks, logging the parking location of the vehicles. A cluster map is then drawn to show areas of frequent parking locations. With the output of the cluster map, the following can be drawn: Raise Alert of "Inconsistent Parking Locations", if parking locations fall about 50 meters outside the registered parking coordinate (VPL). Can display the map *"Most Frequent Parking Places"* when queried. Also opens a google map with a pin drop leading you to the Vehicle Parking Location (VPL).
	Over speeding warning *This alert must be acknowledged to be cleared off the chart.*	This is a safety feature necessary to alert drivers of the risks of over speeding. It also seeks correctional interventions from the client (car owner) as well as the manager. In the event where the tracker logs a vehicle speed above a pre-set speed saved in settings file, this alert is raised.	Constantly compare current vehicle speed with pre-set speed. Log alert in grid and sends SMS message to driver, client and manager. Also indicate where the over speeding was logged to be communicated to all.
	Dual User detected *This alert must be acknowledged to be cleared off the chart.*	It is assumed that the safe and normal driving hours for a human cannot exceed 12 hours continuously. In some cases, drivers may exceed these hours putting both themselves and the vehicle at risk of an accident. Or to be efficient, the drivers may recruit a spare driver, so the vehicle is used day and night; this is called Dual User work. Alongside, the comparison of *engine hours (ACC) recorded*, this alert is raised.	This is an analysis and query activity carried out daily for all vehicles. The behavioral patterns that constitute a dual user detection is under investigation. R&D process on-going. Details TBA.
	**Battery Power Cut** *This alert must be acknowledged to be cleared off the chart.*	This is a request for the "alert" icons to be changed.	Replace current icon with the new one on the left. No other change in function required.
	**Buzzer On** *This alert is self-rectifying when the condition is satisfied.*	This is a request for the "alert" icons to be changed.	Replace current icon with the new one on the left. No other change in function required.
	Vehicle Offline *This alert is self-rectifying when the condition is satisfied.*	"Alert" icons to be changed. Since the tracking device uses an established GPRS connection with the telco to communicate with the server, the data bundle gets exhausted and needs recharging. Upon exhaustion, the "Vehicle offline" alert comes on. Unlike a one-time event where the vehicle may perhaps be driving through a zone with no network, the alert sequence for exhausted (or impending) data bundle is quite different, as the alert stays on longer but prior that, there are several repeated offline signals that are emitted.	Currently, the alert signal is raised when the server doesn't receive data packet from tracking device for some time. When signal returns, the alert is removed. The behavior and pattern of repeated alerts when data bundle is exhausted or yet to be is being investigated. R&D process on-going. Details TBA.

FLEET MANAGEMENT MODULE

SUMMARY OF NEW MINOR CORRECTIONS AND FEATURES

System Flowchart (CS): **Summary of New Features**

	Feature	Background Description and Application	How it works
	Communication Module	- WhatsApp Messenger Integration - Selected/Blast Notification via SMS	To be discussed (TBD).
	Authorizations, permissions and privileges	Requires the review, re-structuring of authorizations, permissions and privileges and the inclusion of new ones.	To be discussed (TBD).