DIDI & Service System Integration

Design Document

Revision History

This section of the document records the various re-assessments resulting from any significant technical or logical system changes. Every change to this document (subsequent to initial sign-off) must be recorded in the revision history table below. There are no exceptions.

Revision Level	Date	Author	Changes Made (Include Change Request # if applicable)
1	09/14/2023	Rohit Sathe	Initial Version

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Low Level Design

1. Scope

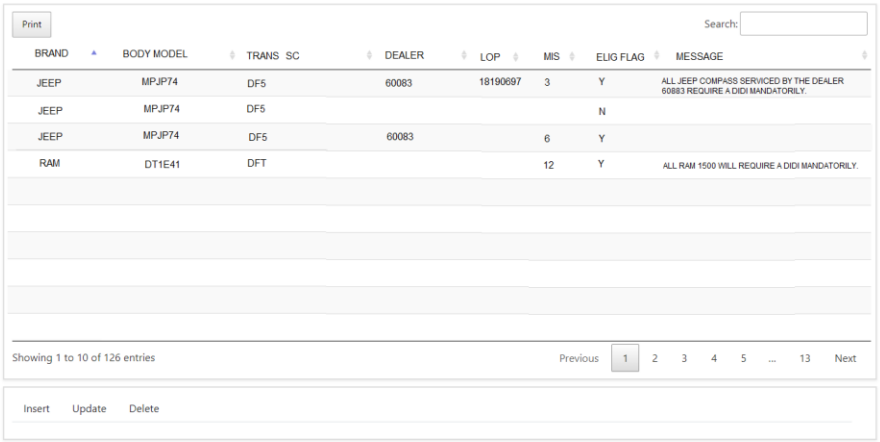
This is an initiative from Quality team to improve quality and customer experience. Focusing on 3MIS repairs for early detection, having the flexibility to go beyond 3MIS, improve issue pre-analysis and resolution by obtaining more details on the 3C from the technician along with the pictures.

Glossary:
MIS – Month in Service
3Cs – Concern, Cause, Corrective Action
DIDI – Dealer Issue Detection Incident
DSDI - Dealer Service Data Integration
SLB – Service Library
CX – Customer Experience
LOP – Labor Operation

2. User Interface Specifications

A parameter maintenance screen would be developed. The parameters can be viewed / added / deleted / updated by the Stellantis corporates.

2.1. Screens



Screen Behavior:

1) On successful authentication and authorization, the user will be redirected to the parameter maintenance screen. Here a data table would be displayed along with the search text-field and pagination.
2) The search would happen real time after the letters are keyed in and is not limited on a particular column.
3) The pagination would show 10 records at a time.
4) There would be a sort function on the columns.
5) There would be 3 buttons namely INSERT / UPDATE / DELETE.
6) If any record needs to be added, a record must be selected by clicking on the record and then if insert is clicked, the data will be auto populated based on the selected record. Here the user can update any of the fields as per necessity and click on insert. The record will be inserted in the table and shown in the data table. Here the status of the record would be A.
7) If any record needs to be updated, then a record needs to be selected and then if update button is clicked, the record is open to update. Here after update button is clicked the earlier record is marked a flag as U (updated) and a new record will be inserted with a status as A (active) and the new record is shown in the data table.
8) If any record needs to be deleted, then a record needs to be selected and then if delete button is clicked, the record is open to be deleted. Here after delete button is clicked the earlier record is marked a flag as I (inactive) and the record would not be shown in the data table.

2.2. Reports

NA

3. Application Interface Specifications

3.1. DIDI eligibility service

1. A new service/API would be built to determine whether a DIDI is eligible for the given VIN and/or dealer and/or LOP. The output will also consist of the message specified in the parameter screen. Note that more input parameters would result in more refined search.
2. If any exception/error occurs during the service execution, appropriate error/warning message will be returned to the user otherwise a success message would be returned.

Input parameters:

Field Name	Length	Data Format	Mandatory	Description	Possible Values
VIN	17	Character	Y	17 characters VIN	3C4NJDCB4KT616765
Dealer Code	5	Character	N	Dealer Code	60085
Source	3	Character	Y	Source value to identify source of call	SLB, VIP
LOP	8	Character	N	Labor Operation	18190697
Date	26	Character	Y	In Service Date	2023-09-21 14:34:40

Output parameters:

Field Name	Length	Data Format	Description	Possible Values
VIN	17	Character	17 characters VIN from request.	
Dealer Code	5	Character	Dealer code from request.	
LOP	8	Character	Labor operation from request.	
Response code	1	Character	Success/Failure.	0 – Success 1 - Failure
Message	100	Character	Success or Failure Message Description.	
DIDI Eligibility flag	1	Character	DIDI Eligibility flag.	Y/N
DIDI message	100	Character	DIDI message if any.	

Parameters that govern the determination of the DIDI eligible flag:

Field Name	Length	Data Format	Description	Possible Values
Brand	25	Character	Brand of the vehicle.	JEEP, RAM, DODGE
Body Model	6	Character	Body model of the vehicle.	MPJP74
Model Year	NA	Integer	Model year of the vehicle.	2019
Dealer Code	5	Character	Dealer Code.	60085
LOP	2/4/6/8	Character	Labor Operation.	18 /1819 / 181906 / 18190697
MIS	NA	Integer	Month in Service eligibility	3, 6
Engine SC	3	Character	Engine SC.	EDE / ESS
Transmission SC	3	Character	Transmission SC.	DFT / DF5

3.1.1. Normal Processing:

1. Consumers such as SLB will call the API token URL for AWS Incognito service by authenticating with the Client ID and Secret Key. Once authenticated the AWS service will send back an OAuth token.

2. The consumers then invoke the API main URL by passing in the token. [Note that the validity of the token can be configured in the AWS Cognito service.]. The API Gateway intercepts the request and checks the authorization level of the request i.e., it gives the control to authorizer lambda which verifies the token. If the token is invalid, then user is given an error message about the token being invalid/expired. If the token is valid the execution control is passed to the function lambda where the actual API method invocation happens.

3. The inputs from SLB are VIN (mandatory), dealer code, LOP and source (mandatory example: SLB). The VIN is looked up against the VIN detail service and the values for brand, body model etc. are derived. [brand/body model etc. are derivable parameters i.e., the parameters that can be derived from a VIN. Other parameters such as Dealer and LOP are non-derivable meaning they cannot be derived from the VIN and cannot be used if not provided].

4. If the vehicle service encounters any errors/exceptions, then an appropriate response will be returned to the consumers.

5. Now the parameters (data elements from the service) along with VIN and Dealer Code are compared against the parameter table by a Select SQL query and eligible records are fetched. Note that the records can be added, modified, deleted by the business by using the screen specified in the section: 2.1.

6. A ranking logic based on the inputs will be applied to choose and pick the most suitable row if multiple records are present in the result set.

7. The MIS and the message will be fetched from the record.

8. Now at this step the MIS calculation will happen and if the MIS calculated is less than the value fetched from the record then the eligibility flag is set to Y otherwise it is set to N. Here the run date would be the current day of the run. The In-Service Date of the vehicle is passed by the consumer as an input.

9. In the Step 3 before calling the vehicle service to fetch the vehicle details there are a couple of logical checks as below:

   - **TSB / Flash LOP logic**:
     If the LOP qualifies for the TSB or Flash LOP, then the response will be directly returned with the flag as N.

   - **Pre-Auth eligibility**:
     This logic will be added in the Phase 2. For this release Dealer communication will be sent - may be an announcement (Content request) or DC email or other channels.

3.1.2. Special Processing

In case of any error/exception while the Eligibility module is invoked a response code '1' would be returned to the user along with a message '**DIDI Eligibility module has encountered a problem. Please try again later.**'. The consumer can choose to show an appropriate message in the system and choose to default the eligibility flag as deemed appropriate.

4. Physical Data Storage/Management Specifications

Data Storage would be done in AWS RDS service. MySQL database would be used for data storage.

There will be 3 tables created in the RDS MySQL database.

1) Parameter Maintenance table:

```
CREATE TABLE DIDI_PARAM_MAP (
C_BRAND VARCHAR (25) NOT NULL,
I_MOD_YR INT NOT NULL,
C_BODY_MODEL CHAR(6) NOT NULL,
C_ENGINE_SC CHAR(3) NOT NULL,
C_TRANS_SC CHAR(3) NOT NULL,
C_DLR CHAR(5) NOT NULL,
C_ZONE CHAR(2) NOT NULL,
C_LOP VARCHAR(8) NOT NULL,
Q_MIS INT NOT NULL,
L_ELIG CHAR(1) NOT NULL,
L_STAT CHAR(1),
X_MSG VARCHAR(100) NOT NULL,
I_LOGON_ADD VARCHAR(100) NOT NULL,
T_STMP_EFF_STRT DATETIME,
T_STMP_EFF_END DATETIME,
T_STMP_ADD DATETIME,
T_STMP_UPD DATETIME

CONSTRAINT DIDI_PARAM_MAP_PK PRIMARY KEY CLUSTERED (C_BRAND,
C_BODY_MODEL, C_ENGINE_SC, C_TRANS_SC))
```

2) Audit table:

```
CREATE TABLE DIDI_AUDIT (
C_SRC CHAR(3) NOT NULL,
C_VIN CHAR(17) NOT NULL,
C_DLR CHAR(5) NOT NULL,
C_LOP CHAR(8) NOT NULL,
L_RESP_FLAG CHAR(1) NOT NULL,
X_PROCESS_MSG VARCHAR(100) NOT NULL,
T_STMP_PROC DATETIME)
```

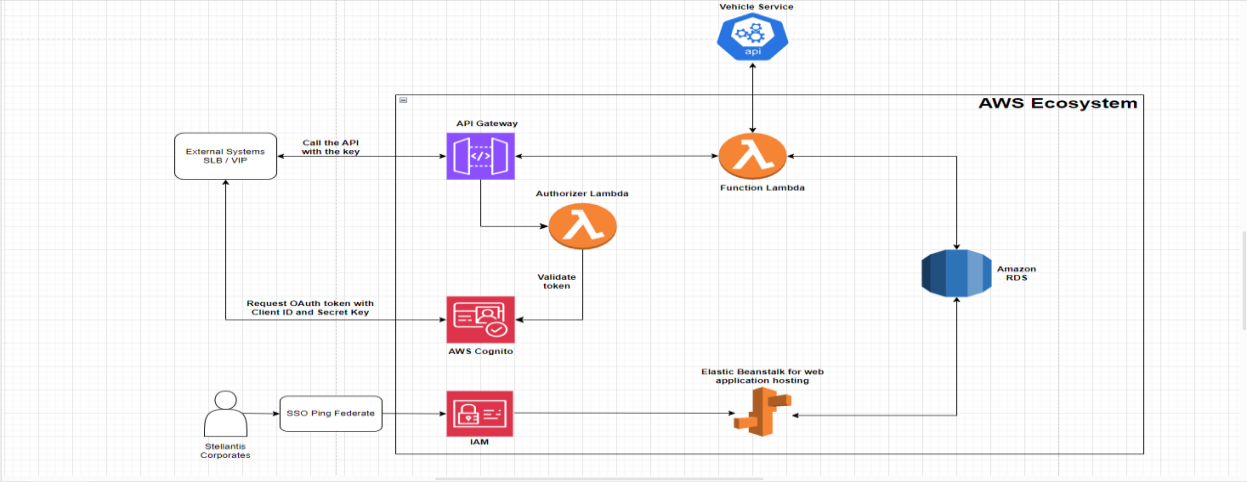
3) User table:

```
CREATE TABLE DIDI_USER (
N_FIRST VARCHAR (80) NOT NULL,
N_LAST VARCHAR(80) NOT NULL,
X_ADDR_EMAIL VARCHAR(100) NOT NULL PRIMARY KEY,
L_ACCESS CHAR(1),
T_STMP_LAST DATETIME)
```

Schema name: didi

5. Module Detailed Design

Architecture diagram:



1. AWS Cognito Service details:

   Test environment :
   URL:

   Prod environment :
   URL :

   Request and Response :

2. Eligibility module service details :

   Test environment:
   URL:

   Prod environment :
   URL :

3. VIP Service details:

   Please see the attached specs.

   basicVIP_API_Service Library.docx

4. Response verbiage: The eligibility module has encountered a problem. The vehicle details cannot be retrieved at this point. Please try again later.

5. SQL query to fetch the records from the parameter table. Note that the query will be structured dynamically based on the number of inputs available.
   SELECT * FROM DIDI_PARAM_MAP WHERE C_BRAND =? AND C_BODY_MODEL =? AND C_ENGINE_SC =? AND C_TRANS_SC =? WITH UR;

6. A ranking logic will be applied to select and choose the most suitable record from the above results. There may be single or multiple records fetched from the database depending upon the values.
   1. Calculate the rank or value of the input.
      If only VIN is provided – 10.
      If VIN and dealer code are provided – 10 + 5 = 15.
      If VIN and LOP are provided – 10 + 2 = 12.
      If VIN, Dealer code and LOP are provided – 10 + 5 + 2 = 17.
   2. Now calculate the rank or value of each record in the output and map it to the rank in the input. The matching record will be the record selected for further processing.

7. The eligible MIS and the generic message would be fetched from the record.

8. MIS calculation formula:
   MIS = (Run Date - ISD) / 30.416 + 0.99. Here Run Date is the day of the API execution and the ISD or the in-service date is passed by the consumer as an input parameter.

9. In the Step 3 before calling the vehicle service to fetch the vehicle details there are a couple of logical checks as below:

a) TSB / Flash LOP logic:
Check if the LOP provided in the input starts with 18 or 19. In these cases it is a TSB/RSU lop, and we need to give the eligibility flag as N and the message – 'The LOP provided is a TSB or RSU lop'. If the lops' 7th digit is 9 then as well it is a Flash LOP. Here as well we need to give the eligibility flag as N and the message – 'The LOP provided is a Flash lop'.

b) Pre-Authorization logic:
As discussed in the weekly meeting on 09/25/2023 – the pre-authorization logic will be applied for 3 categories of dealers (base, plus and premium) vs the LOP used but it will be applied in the Phase 2 of the project. Dealer communications will be sent in this regard - may be an announcement (Content request) or DC email or other channels.

6. Training and Documentation

a. Training

No training is required for accessing the application.

b. System Documentation

1. Transition handbook will be updated.
2. Future scope/enhancements:
   a. Export to excel functionality - As this Parm increases in size the records of the parm can be exported to excel document and can be filtered as per necessity.
   b. A simple help document to be provided for the usage of this application.
   c. Link out for this parm in other portals such as GWA, DC.

Appendix A – Low Level Design Issues

The information below lists all open issues at the time this document was printed. For each issue, a description, person(s) responsible and required resolution date is provided.

The information below lists all issues that have been closed at the time this document was printed. For each issue, a description of the issue, person(s) who closed the issue, resolution date, and resolution description are provided.

<Insert/provide reference to the closed issues from the Issues/Decision Log here>