Test Summary Report

Contents

1. *Purpose*

This document explains the various activities performed as part of API Testing of restful services which serve their content via HTTP.

2. *Application Overview*

Auto1.com Application is built to provide the best price to sell cars by choosing from provided interdependent dropdown options. There are several modules like Car Manufacture, Car Model & Car Registration Year which are integrated to fulfill the purpose.

3. *Testing Scope*

a) In Scope

API Testing of for the following modules are in Scope of Testing

- **GET** /v1/cartypes/manufacturer
  - locale (accepts any locale)
  - wa_key

- **GET** /v1/cartypes/maintypes
  - manufacturer (accepts manufacturer codes)
  - locale (accepts any locale)
  - wa_key

- **GET** /v1/cartypes/builtdates
  - manufacturer (accepts manufacturer codes)
  - maintype(accepts maintype codes)
  - locale

b) Out of Scope

Services also accept other input parameters like pagination or sorting but those are not in the scope of this task.

4. *Test Tools*

Test Tools:

This automation framework has been developed using some of the best open source technologies which have large community based support available for continuous improvement.

JDK 1.8 – Utilized for Java Stream API for Bulk Data Operations on Collections and forEach() method in Iterable interface.

Rest Assured – Easy setup for HTTP connection, send a request, receive and parse a response.

Maven – For build, execution & version control

Cucumber – Implementation of BDD automation framework. Feature based Gherkin test scenarios are easy to understand for both technical & business team.

TestNG – produce HTML Reports, generate logs & Parallel testing capable.

Jackson Core – Utilized for POJO creation to handle Serialization & Deserialization of JSON objects.

Log4J – Utilized to log info, warning, errors for debugging purpose.

Apache POI – Utilized to use excel as input source to handle data variations in different environments due to implementation of new manufacturer, car models or registration year.

Cucumber Basic Reports – Comes by default with cucumber implementation.

Cucumber JVM Reports (Jenkins like) – These reports can be utilized to share the automation status among the scrum team, IT leadership & business stakeholders.

5. *Metrics*

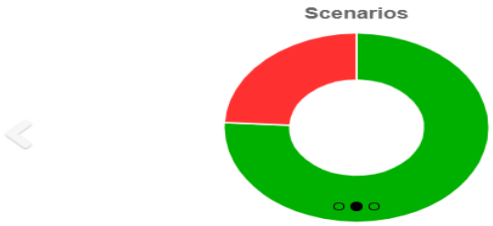
a) No. of test cases planned vs executed

b) No. of test cases passed/failed

Test cases planned	Test cases executed	TCs Pass	TCs Failed
29	29	22	7

Features Statistics

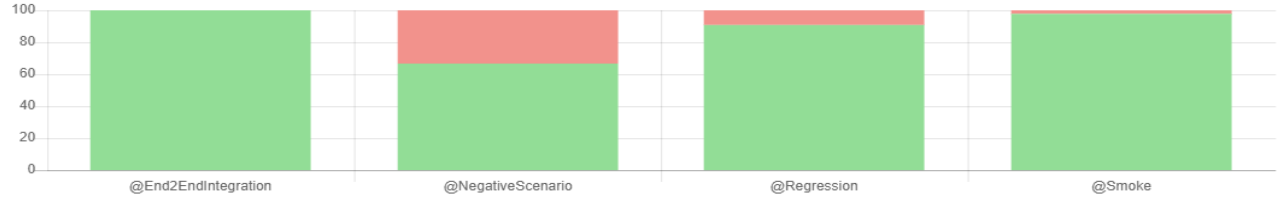
The following graphs show passing and failing statistics for features



	Steps						Scenarios			Features	
Feature	Passed	Failed	Skipped	Pending	Undefined	Total	Passed	Failed	Total	Duration	Status
Validate Car Manufacturer API Service	12	2	0	0	0	14	4	2	6	4.791	Failed
Validate Car Model API Service	27	2	0	0	0	29	9	2	11	32.470	Failed
Validate Car Model Registration Year API Service	23	3	0	0	0	26	7	3	10	7:21.009	Failed
Validate End-To-End User Experience with All Service Integration	7	0	0	0	0	7	2	0	2	7:18.378	Passed
	69	7	0	0	0	76	22	7	29	15:16.648	4
	90.79%	9.21%	0.00%	0.00%	0.00%		75.86%	24.14%			25.00%

Tags Statistics

The following graph shows passing and failing statistics for tags



	Steps						Scenarios			Features	
Tag	Passed	Failed	Skipped	Pending	Undefined	Total	Passed	Failed	Total	Duration	Status
@End2EndIntegration	7	0	0	0	0	7	2	0	2	7:21.910	Passed
@NegativeScenario	12	6	0	0	0	18	3	6	9	4.774	Failed
@Regression	69	7	0	0	0	76	22	7	29	15:13.190	Failed
@Smoke	44	1	0	0	0	45	14	1	15	8.115	Failed
	132	14	0	0	0	146	21	34	55	22:47.989	4
	90.41%	9.59%	0.00%	0.00%	0.00%		38.18%	61.82%			25.00%

c) No of defects identified and their Status & Severity

	Critical	Major	Medium	Cosmetic	Total
Defects	3	4	0	1	8

Defect ID	D01
Defect Name	Accepting Incorrect Protocol for Manufacturer Service Endpoint
Defect Description	Service is returning valid response even after changing the protocol of endpoint from HTTP to HTTPS which is a big risk and can compromise the security of the service and also not matching as per the requirement shared.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/manufacturer 2. Check the values returned in wkda object which represents the car Manufacturer name. 3. Now change the protocol to HTTPS for the endpoint https://api-aws-eu-qa-1.auto1-test.com/v1/car-types/manufacturer 4. Check the values returned in wkda object which represents the car Manufacturer name.
Severity	**Critical**
Expected	Service should only return successful response when endpoint has HTTP protocol
Actual	Service is returning successful response when endpoint has both HTTP & HTTPS protocol

Defect ID	D02
Defect Name	Accepting Incorrect Protocol for Car Model Service Endpoint
Defect Description	Service is returning valid response even after changing the protocol of endpoint from HTTP to HTTPS which is a big risk and can compromise the security of the service and also not matching as per the requirement shared.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/main-types?manufacturer=487 2. Check the values returned in wkda object which represents the car Model name. 3. Now change the protocol to HTTPS for the endpoint https://api-aws-eu-qa-1.auto1-test.com/v1/car-types/main-types?manufacturer=487 4. Check the values returned in wkda object which represents the car Model name.
Severity	**Critical**
Expected	Service should only return successful response when endpoint has HTTP protocol
Actual	Service is returning successful response when endpoint has both HTTP & HTTPS protocol

Defect ID	D03
Defect Name	Accepting Incorrect Protocol for Registration Year Service Endpoint
Defect Description	Service is returning valid response even after changing the protocol of endpoint from HTTP to HTTPS which is a big risk and can compromise the security of the service and also not matching as per the requirement shared.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/built-dates?manufacturer=107&main-type=Azure 2. Check the values returned in wkda object which represents the car registration year. 3. Now change the protocol to HTTPS for the endpoint https://api-aws-eu-qa-1.auto1-test.com/v1/car-types/built-dates?manufacturer=107&main-type=Azure 4. Check the values returned in wkda object which represents the car registration year.
Severity	**Critical**
Expected	Service should only return successful response when endpoint has HTTP protocol
Actual	Service is returning successful response when endpoint has both HTTP & HTTPS protocol

Defect ID	D04
Defect Name	Accepting Incorrect/Additional query parameters for Manufacturer Service Endpoint
Defect Description	The Service Endpoint is accepting Incorrect/Additional query parameters and still giving the valid response. This is not a critical issue as end user will not be able to pass any additional parameters from UI front.

Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/manufacturer 2. Check the values returned in wkda object which represents the car Manufacturer name. 3. Now include additional/invalid query parameters to the endpoint http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/manufacturer?&test=test 4. Check the values returned in wkda object which represents the car Manufacturer name.
Severity	**Major**
Expected	Service should only return successful response for valid endpoint with no additional/invalid query parameters
Actual	Service is returning successful response for valid endpoint with additional/invalid query parameters

Defect ID	D05
Defect Name	Accepting Incorrect/Additional query parameters for Car Model Service Endpoint
Defect Description	The Service Endpoint is accepting Incorrect/Additional query parameters and still giving the valid response. This is not a critical issue as end user will not be able to pass any additional parameters from UI front.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/main-types?manufacturer=590 2. Check the values returned in wkda object which represents the car model name. 3. Now include additional/invalid query parameters to the endpoint http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/main-types?manufacturer=590&test&test 4. Check the values returned in wkda object which represents the car model name.
Severity	**Major**
Expected	Service should only return successful response for valid endpoint with no additional/invalid query parameters
Actual	Service is returning successful response for valid endpoint with additional/invalid query parameters

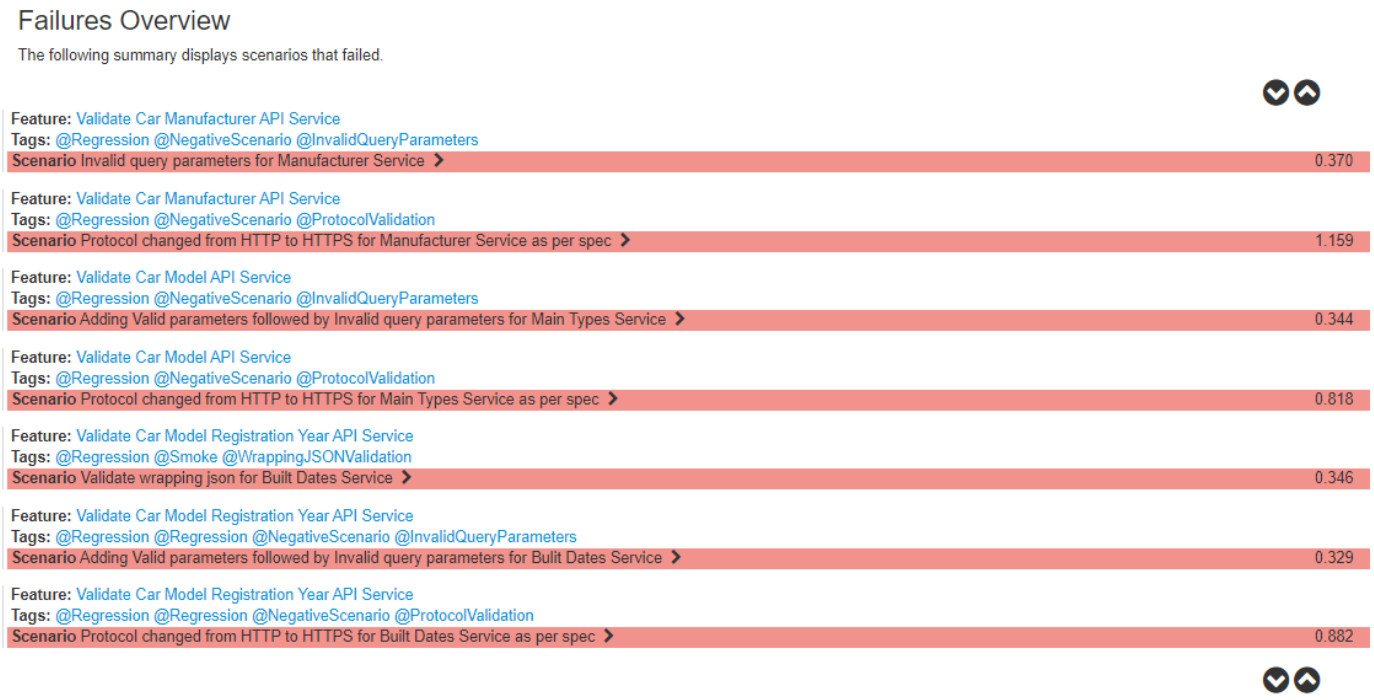
Defect ID	D06
Defect Name	Accepting Incorrect/Additional query parameters for Registration Year Service Endpoint
Defect Description	The Service Endpoint is accepting Incorrect/Additional query parameters and still giving the valid response. This is not a critical issue as end user will not be able to pass any additional parameters from UI front.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/built-dates?manufacturer=190&main-type=LN 2. Check the values returned in wkda object which represents the car registration year. 3. Now include additional/invalid query parameters to the endpoint http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/built-dates?manufacturer=190&main-type=LN&test=test 4. Check the values returned in wkda object which represents the car registration year.
Severity	**Major**
Expected	Service should only return successful response for valid endpoint with no additional/invalid query parameters
Actual	Service is returning successful response for valid endpoint with additional/invalid query parameters

Defect ID	D07
Defect Name	Incorrect JSON wrapper for Registration Year Service Endpoint
Defect Description	The Service is not returning the expected JSON wrapper shared in requirement document where it should return keys like page, pageSize, totalPageCount & Json object wkda with its key-value pairs but we are not getting page, pageSize, totalPageCount in response. This is not critical as on now because per requirement pagination or sorting are out of scope where these values play a key role.
Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/built-dates?manufacturer=190&main-type=LN 2. Check the the response is only returning wkda object and its key-value pairs.
Severity	**Major**
Expected	Service should return the exact wrapper shared in business requirement which includes page, pageSize, totalPageCount & Json object wkda with its key-value pairs in the response.
Actual	Service is only returing & Json object wkda with its key-value pairs in the response.

Note – Cosmetic defect was caught during part of exploratory testing and is not included in Automation report.

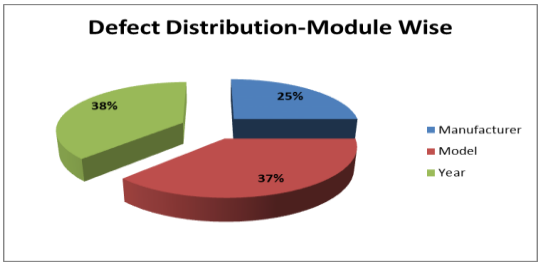
Defect ID	D08
Defect Name	Car Model names spelled incorrectly
Defect Description	Car model name not correct for few cars.

Steps to reproduce	1. Open below URL in postman. http://api-aws-eu-qa-1.auto1-test.com/v1/car-types/main-types?manufacturer=487 2. Check the values returned in wkda object which represents the car model name.
Severity	**Low(Cosmetic)**
Expected	Car model name for Lexus brand should be "CT-Series", "GS-Series", "IS-Series", "LC-Series", etc
Actual	Car model names for Lexus brand is showing "CT-Serie", "GS-Serie", "IS-Serie", "LC-Serie", etc.



d) Defects distribution – module wise

	Manufacturer	Model	Year	Total
Critical	1	1	1	**3**
Major	1	1	2	**4**
Medium	0	0	0	**0**
Cosmetic	0	1	0	**1**
Total-->	**2**	**3**	**3**	**8**



6. *Types of testing performed*

a) Smoke Testing

- This testing will ensure that major functionalities are working fine.
- This testing covers getting the right success code for the services along and also ensures that we are getting atleast one key value pair for drop downs so that customer don't get blank options which blocks further actions on application resulting in bad user experience.
- We are also ensuring that we get right structure of wrapping JSON for dependent functionalities like pagination or sorting works fine.

Scenarios Covered:

1. GET operation Success Status for Manufacturer Service and no blank wkda object **(to ensure customer not getting blank dropdown on UI)**
2. Validate wrapping json for Manufacturer Service
3. GET operation Success Status for Main Types Service and no blank wkda object **(to ensure customer not getting blank dropdown on UI)**
4. Validate wrapping json for Main Types Service
5. Random Validation of Car models and Year of Manufacturer using Excel Input Sheet
6. GET operation Success Status for Built Dates Service and no blank wkda object **(to ensure customer not getting blank dropdown on UI)**
7. Validate wrapping json for Built Dates Service

b) System Integration Testing

- The Integration Testing on the Application under test is to ensure that interdependent modules play well together as per the requirements.
- Critical Business scenarios were tested to make sure important functionalities in the application works as intended End-To-End without any errors.

Scenarios Covered:

1. GET operation for interdependency validation of Entire Flow
2. Random Validation of Car models and Year of Manufacturer using Excel Input Sheet

c) Regression Testing

- Regression testing with below scenarios will cover both positive and negative scenarios to ensure the broader coverage for the rest services.
- In the negative scenarios we are ensuring endpoints should not accept invalid query parameters and HTTP protocol & method works as per requirement which is important aspect of security testing.
- This testing will also ensure that user see unique values in dropdown which will result in better user experience.

Scenarios Covered:

1. All Scenarios mentioned under Smoke & Integration testing were covered.
2. POST operation Failure Status for Manufacturer Service
3. Validate list of Unique Manufacturer
4. Invalid query parameters for Manufacturer Service

5. **Protocol changed from HTTP to HTTPS for Manufacturer Service as per spec**
6. **POST operation Failure Status for Manufacturer Service**
7. **Adding Valid parameters followed by Invalid query parameters for Main Types Service**
8. **Protocol changed from HTTP to HTTPS for Main Types Service as per spec**
9. **Validate list of Unique Car models for different manufacturer**
10. **POST operation Failure Status for Manufacturer Service**
11. **Adding Valid parameters followed by Invalid query parameters for Built Dates Service**
12. **Protocol changed from HTTP to HTTPS for Built Dates Service as per spec**
13. **Validate list of Unique Registration Year for all Car Models of Manufacture**

7. *Recommendations*

- Noticed mis-spelled names for some car model which might be confusing for the end customers. Hence business analyst should properly document the naming convention on Manufacturer & models and same needs to be shared with testing team so that the service response can be validated against those values shared in requirement document.
- Subsequent API requests should use a token based authentication like JWT/oAuth instead of the key/value pair as query parameter to enhance security of services.
- Content Type can be set explicit to application/json. It doesn't have any severe impact on the GET services as we are not passing any request body to it but as we are dealing with JSON response so from the standardization and code consistency perspective for RESTful services, it's a good practice to follow.

8. *Conclusion*

This automated testing framework developed by utilizing the open source applications and has potential to be enhanced continuously for future requirements. This framework will increase team's test speed and efficiency, improve test accuracy, and will reduce test maintenance costs as well as lower risks. Few essential key reasons to utilize this framework are mentioned below:

- Improved test efficiency
- Lower maintenance costs
- Minimal manual intervention
- Maximum test coverage