*Background:*

* *Exchange system developer ↔ software engineer:  
   typically by SyA= System-Anforderung = a kind of system requirements specification (SRS)*
* *Exchange system developer ↔ customer  
   possibilities: - SyA (initial version without too much internal information)  
   - less formal documents like eForms MasterLayout "Pflichtenheft"  
   - Concept slides / Protocols*
* *Exchange project manager ↔ customer  
   typically by requirements specifications for complete products ("Pflichtenheft")*

*Instructions for use:*

* ***Chapter headlines must not be deleted; if not required fill in “n.a.”. For better readability not applicable chapters can be formatted invisible.***
* ***Additional chapters may be added at the end***
* *Get RCMS ID of requirement*
* *Get document and version number of the SyA*
* *Save this template under corresponding name (including RCMS ID)  
  Details of SyA naming conventions directory to use:  
  see REMP (requirements engineering and management plan)*
* *Fill in the header of the SyA*
* *Fill in this cover sheet (page 1) of the SyA*
* *Fill in status and distribution (starting at page 2) of the SyA*
* *Fill in further <information in brackets>*
* *Yellow instructions and hints will not be printed.  
  To hide yellow parts press (Ctrl+\*) or the button* (¶) *(only if in Options the appropriate fields are unticked: Tools->Options-> View untick ‘Hidden Text’ in the field ‘Formatting marks’  
  Tools->Options->Print untick ‘Hidden Text’ in the field ‘Print with document')  
  Instructions can be deleted*
* *For REVIEW or AUTOR READER CYCLE (ARC/ALZ)* *line enumeration must include yellow instructions, i.e. instructions must be visible*

**History of Template-Changes**

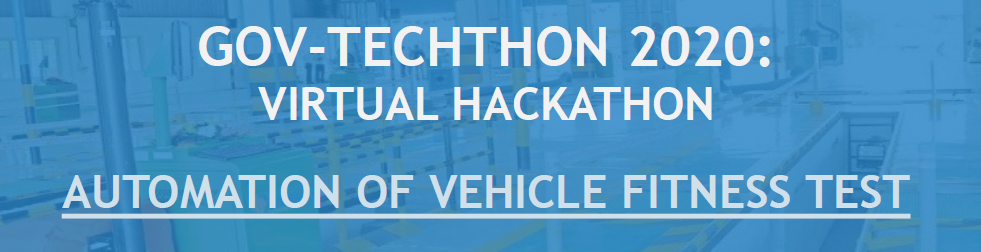
|  |  |  |  |
| --- | --- | --- | --- |
| Date | Version | Editor | Changes |
| 23.02.2006 | 10 | DS/EEI1 - Brenndörfer | * “Instructions for use” edited * “History of Template Changes” inserted” * “State of Agreement” renamed and modified * Return to sender deleted State of Commitment Phase deleted Monitoring relevance inserted * Chapter *1.2.4* *Information on Quality* deleted * Chapter 2.1 renamed and instructions added * Chapter 2.2 instructions edited * Chapter 2.3 instructions added * Chapter 2.3 became chapter 2.7 * Chapter 2.4 to chapter 2.6 added * Chapter 3 instructions edited * Chapter 3.1 Tables: “Massage name” changed to “Brief identifier” “Deactivation” became own chapter (2.4) * Chapter 6 and chapter 7 deleted |
| 25.07.2006 | 11 | DS/EEI1 – Brenndörfer | * Write protection for template added * “Instructions for use” part headlines extended * “Instructions for use” part line enumeration (concerning Review & ALZ) inserted * “Instructions for use” part instruction handling edited * “Variant handling” became new chapter (2.2) * Chapter 2.3: instructions for robust design added * Chapter 2.7: instructions for diagnostic functions edited |
| 05.12.2006 | 12 | DS/EEI1 – Brenndörfer | * Instruction added to comment the way of Risk Analysis * Instruction added to comment the decision why a FMEA relevance is not expected * Instruction added to comment the decision if and why DRBFM is used or not * Chapter 2.4: List of special operation conditions added |
| 23.11.2007 | 13 | DS/EEI1 – Brenndörfer | * SSD relevance inserted * Chapter 3.4: Box ‘SSD’ edited. List with nodes added. |

Function Requirement Specification (FRS)

for function

Vehicle Fitness Test

|  |
| --- |
|  |



Team: Fit for Future

**History of Changes**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Version | Editor | Changes |  |
| 31/10/2020 | 01 | Renju Kuriakose | * Initial draft |  |
|  |  |  |  |  |

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# General

## List of Abbreviations and Special Technical Terms

## Referenced Documents and Further Information

### Technical Constraints

### Information of Development History

NA

### Information on Function Risks

NA

# Description of the Function

## Description and motivation

**Description:**

As per Motor Vehicle act, all commercial vehicles are mandated to undergo fitness test periodically, depending on vehicle age. The vehicles are to be brought to designated fitness centres (which are normally one centre per district in most states) for inspection and certification. There are normally long queues and the process is hassle some. An innovative solution is required to ease this process for all

**Motivation**

Vehicle fitness test is a manual and re-iterative process today, which is highly time consuming that increases the load on both officials and applicants. With an increasing care for the nature and human, a stringent performance test based on the vehicle performance is a need of the hour. This demands a thorough automated testing of the vehicle where physical characteristics, engine characteristics, vehicle dynamics, component health like failure in sensors or actuators etc has to verified which gives a full confirmation for the vehicle to be fit for road

In current mechanism, the vehicle is brought to the test and in case of alterations required it is taken back and this demands an iterative process which heavily time and effort consuming and over loading the resources. Here a system is very much required to have a transparent pre-check so that the unnecessary iterations can be avoided.

## Mode of Testing

Vehicle fitness test is carried out by the Motor Vehicle Inspector of the respective transport office the vehicle is registered with through various stages like

* Verification of certificates and documents
* Physical appearance of the vehicle
* Performance test of the vehicle
* Compliance to the government regulatory norms for the segment and type

## Normal Operation

Vehicle fitness test will be developed as a mobile application support

#### Application and Deployment

An application will be a mobile based which can be easily used by the Motor Vehicle Inspector

Functional requirements

1. A secure login with Captcha and login credentials
2. Should be able switch to local languages
3. Tips to usage – Self guiding, no expert requirement
4. Link to Vahan database to collect the details
5. Scalable to Pan India

|  |
| --- |
| **Requirement Tag** : FR\_VFT\_001 |
| **Requirement Description:** Application |
| **Rationale:** The application should beselfguiding with secured options |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

#### Cloud storage

Functional Requirements

1. Image storage to cloud for AI based models with tagging to corresponding fitness test application
2. Lossless storage mechanism, Compressed mode

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| --- |
| **Requirement Tag** : FR\_VFT\_002 |
| **Requirement Description:** Cloud Storage |
| **Rationale:** Cloud storage as per the fitness test application number |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

#### Geo location of the Test

Functional Requirements

1. The location of the test should be identified and checked whether its within calibratable distance of the
2. Identify whether test happens at the test centre itself

|  |
| --- |
| **Requirement Tag** : FR\_VFT\_003 |
| **Requirement Description:** Geo location of the Test |
| **Rationale:** Identify whether test happens at the vehicle office |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

#### Validity of the test based on vehicle age and type

Functional Requirements

1. Identify the type and class of vehicle
2. Calculate the age of the vehicle
3. Calculate the test validity date
4. Calculate the inspection due date

|  |
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| **Requirement Tag** : FR\_VFT\_004 |
| **Requirement Description:** Validity of the test based on vehicle age and type |
| **Rationale:** Identify the vehicle fitness due dates from the age and type of the vehicle |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

#### Digital certificate

Functional requirements

1. Test results storage in the database
2. Downloadable from any point
3. Identification of the test inspector provision
4. Test Date, Office details
5. Provision to trigger due for inspection

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| --- |
| **Requirement Tag** : FR\_VFT\_005 |
| **Requirement Description:** Digital Certificate |
| **Rationale:** Test results stored secured and easily downlodable for applicants |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

#### Actual Test

1. Certificates and bookings
   1. Application number
   2. Pollution certificate
   3. RC verification

Functional requirements

1. Right vehicle has to be selected in the app with application number
2. Number plate image to be verified against vehicle in application number
3. Chasis number to be verified against the application number
4. Pollution validity should be validated and not expired

|  |
| --- |
| **Requirement Tag** : FR\_VFT\_006 |
| **Requirement Description:** Vehicle validation |
| **Rationale:** Validate the vehicle doocuments against the real vehicle |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

1. Stand still tests – Physical

Functional requirements

1. Check the Reg No and Chassis No verification
2. Check the Physical appearance of the vehicle tests – all sides
3. Check for vehicle damages
4. Check the tyres and only good tyres should be allowed
5. All lights functionality should be tested and verified
6. Wipers function should be verified
7. Reflectors on the vehicle should be properly sticked and placed
8. Dashboard of the vehicle should be proper
9. Steering gear – The play of the steering gear to be checked and if more play, test should fail
10. Seating Priorites – Specific seat availabilty for partially/fully disabled or priority category is available

|  |
| --- |
| **Requirement Tag** : FR\_VFT\_006 |
| **Requirement Description:** Physical Vehicle validation |
| **Rationale:** Check the physical fitness of the vehcile |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

1. Drive tests

Functional Requirements

* 1. Check the Speedometer is working fine
  2. Check the Odometer is working fine
  3. Check the Brake efficiency
  4. Check the Speed limiter device is working fine

|  |
| --- |
| **Requirement Tag** : FR\_VFT\_007 |
| **Requirement Description:** Vehicle Performance validation |
| **Rationale:** Check the physical fitness of the vehcile |
| **Verification Criteria:** Review / Testing |
| **Assumptions:** None |
| **Constraints:** None |

## Test Input Possibilites

1. Physical examination and Verification
2. Image/Video based
3. Innovative new tests to meet requirements

## Boundary Conditions

#### Output Expectation

1. Secure Login for the application
2. Motor Vehicle Inspector Specific information in certificate
3. *Vehicle Information* in certificate

# Test strategy

* *Specification of test cases at system level*
* *Test equipment (Does the injector current shape have to be monitored on the oscilloscope?)*
* *Environment (Real Car? Labcar? Special settings for the Labcar?)*

-

# Open Items

*Items to be clarified / questions.*

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