*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*

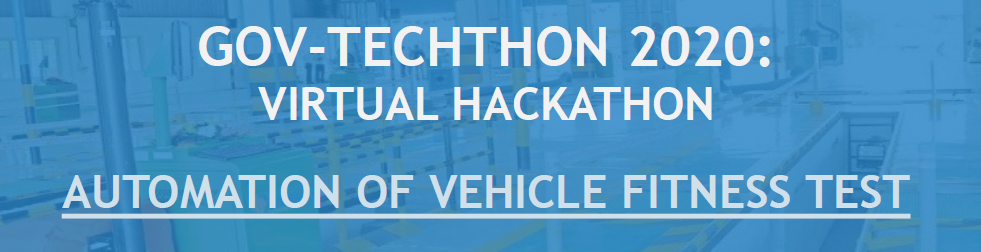
**History of Template-Changes**

|  |  |  |  |
| --- | --- | --- | --- |
| 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. |

System Requirement Specification (SRS)

Vehicle Fitness Test

|  |
| --- |
|  |



**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 – Test Requirements

#### Application

An application either PC or mobile based which can be easily used by the Motor Vehicle Inspector

1. A secure application preferably mobile
2. End user – Motor Vehicle Inspector
3. Secure login
4. Local language support
5. Ease of use
6. Scalable to Pan India

#### Deployment

1. Backend integration to Vahan
2. Application number based link to Vahan database to collect all details

#### Cloud storage

1. Image storage to cloud for AI based models
2. Lossless storage mechanism, Compressed mode

#### Geo location of the Test

1. Transparency of test
2. Identify whether test happens at the test centre itself

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

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

#### Digital certificate

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

#### Actual Test

1. Certificates and bookings
   1. Application number
   2. Pollution certificate
   3. RC verification
2. Stand still tests – Physical
3. Reg No and Chassis No verification
4. Physical appearance tests – all sides
5. Any damages
6. Tyres
7. All lights functionality
8. Wipers
9. Reflectors
10. Dashboard
11. Steering gear
12. Seating Priorites
13. Drive tests
    1. Speedometer check
    2. Odometer check
    3. Brake Test
    4. Speed limiter check

## Test Input Possibilites

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

## Boundary Conditions

The window based measurement can be done as per the below sequencer set up.

#### 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?)*

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# Open Items

*Items to be clarified / questions.*

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