

# • • • • • T Systems •

## **Database for the Exchange of Type Approval Documentation (DETA)**

Feasibility Study

From

T-Systems Enterprise Services GmbH  
Engineering Process Integration & Process Management  
SSC EM / EPDM/P  
Ralf Pickelmann

to

United Nations  
Economic Commission for Europe

# 1 Table of Contents

<b>1</b>	<b>Table of Contents .....</b>	<b>2</b>
<b>2</b>	<b>Abstract.....</b>	<b>3</b>
<b>3</b>	<b>Requirements of DETA .....</b>	<b>4</b>
3.1	General.....	4
3.2	Functional Requirements.....	5
3.2.1	Document Archive Structure.....	5
3.2.2	System and Document Security .....	7
3.2.3	Management of Documents .....	7
3.2.4	Retrieval of Documents .....	8
3.2.5	Other Function (no DETA Requirement) .....	8
3.3	Quantity Structure.....	9
3.3.1	Document Size and Disk Capacity .....	9
3.3.2	Number of Users .....	10
3.4	Technical Requirements.....	11
3.4.1	WEB Center Requirements .....	11
3.4.2	Client Requirements .....	12
3.4.3	2 <sup>nd</sup> Level Help Desk Requirements .....	12
3.5	Administrative Requirements.....	13
<b>4</b>	<b>Feasibility.....</b>	<b>14</b>
<b>5</b>	<b>Costs .....</b>	<b>15</b>
5.1	Start-up Costs .....	15
5.2	Operating Costs.....	15
5.3	Financing Models .....	15

## 2 Abstract

For several years, the Administrative Committee for the Coordination of Work (WP.29/AC.2) of the World Forum for Harmonization of Vehicle Regulations (WP.29) has considered the possibilities of electronic treatment of type approvals granted according to UNECE Regulations annexed to the 1958 Agreement. The objective is to reinforce the transparency and the efficiency of the 1958 Agreement. The most relevant points are the establishment of an interpretation committee still under consideration by WP.29, and the creation of an electronic database for exchange of type approvals issued by the Contracting Parties to the 1958 Agreement (TRANS/WP.29/885, para. 14; TRANS/WP.29/909, para. 14; TRANS/WP.29/926, paras. 17 and 80; TRANS/WP.29/953, para. 16; TRANS/WP.29/992, paras. 9 and 10; TRANS/WP.29/1016, paras. 75 and 77; TRANS/WP.29/1037, para. 76; TRANS/WP.29/1041, para. 18; TRANS/WP.29/1047, para. 13).

WP.29 recommended investigating the possible installation of an electronic database system for the exchange of type approval data under the 1958 Agreement.

The purpose of this document is to describe the requirements and feasibility for the installation of an electronic Database for the Exchange of Type Approvals (DETA).

A similar system, the so-called European Type Approval Exchange System (ETAES), already exists in the European Union (EU) for the exchange of Whole Vehicle Type Approvals. It is installed on a server with the German type approval authority (KBA) in Flensburg, and used by the EU Member States. ETAES is based on the product TypMaster/DD<sup>®</sup> which is provided by the company T-Systems. TypMaster/DD is also used by many vehicle manufacturers to distribute Approval document with approval authorities, technical services and sales organizations.

Based on the experience gained by the existing ETAES, this document lays down the additional requirements for the future DETA system.

In January 2006, the UNECE organized a Workshop to elaborate a questionnaire to collect the necessary data regarding the requirements of such a database (server performance, storage capacity, functional requirements, financial support, etc.). This questionnaire was presented to WP.29 at its March 2006 session (ECE/TRANS/WP.29/1050, para. 65) and was distributed to all designed Administrative Departments of the Contracting Parties to the 1958 Agreement. The secretariat received 22 replies to that questionnaire and their evaluation was taken into consideration in this report.

## **3 Requirements of DETA**

### **3.1 General**

Based on the experience made by the existing European Type Approval Exchange System (ETAES), which is installed for the purpose of a pilot project on a server with the German type approval authority (KBA) in Flensburg, a new database system should be established by the UNECE, on which the type approval authorities (TAA) of the Contracting Parties (CP) to the 1958 Agreement could store their type approvals. This DETA shall be a secure environment with restraint access (https). The files could be consulted or downloaded by the TAA of all other CPs.

An outsourcing of this project should be possible. The access to the database, the procedure on how to apply for a username and some major technical details (how the database has to be structured, format of files, search features, etc.) will be settled out by WP.29 in the Terms of Reference of the DETA.

The installation of such a database requires a considerable investment into a new database server with a large disk capacity and requires a clear definition of responsibilities by UNECE, CP and, eventually, the automotive industry (as type approvals are in general classified as confidential documents).

A large number of CPs agreed on the importance of this project and the need to establish such a database. Technical and financial constraints are described in following chapters.

## 3.2 Functional Requirements

### 3.2.1 Document Archive Structure

Type Approval documents intended to be stored in DETA shall, in general, be files in the format of Portable Document Format (PDF) at least Version 5. If digital signatures are planned, at least Version 6 is needed. DETA shall be able to store any file format, in order to enable additional information to the approval document e.g. XML files.

As a result of the evaluation of the replies to the questionnaire distributed to the CP, Type Approval documents will be stored, in a first step, without digital signature. The access security to the documentation shall be ensured by DETA itself (see below).

A Type Approval document may have different parts:

- the Communication Form (CF)
- the Information Document (ID)
- the Appendixes to the Information Document (AP)
- the Test Report (TR)

A Type Approval document stored in DETA shall include, according to the 1958 Agreement, at least the communication form (type approval certificate) delivered by the TAA. The authentic document in paper form remains at the TAA or with the applicant.

CPs are free to submit more than this minimum, but it's not mandatory. Note: the necessary disk capacity can remain out of consideration, as there is only a small influence in costs of operation.

As there is no need to divide DETA into different archives, all documents shall be stored in one single archive.

Each document in the archive shall have several search attributes. These attributes are defined when storing the documents and are used by the user while searching to retrieve the required documents.

DETA archive shall start with the following search attributes:

Name	Type	Length	Required	Remarks
ECE Symbol	Fixed List	3	Yes	ECE Symbol of the Contracting Party to the 1958 Agreement (e.g. E 2 for France)
Regulation Number	Fixed List	40	Yes	Regulation Number (e.g. Regulation No. 13 for braking) including a short title
Manufacturer	Text	20	Yes	Manufacturer's name
Type designation	Text	20	Yes	Type designation of the vehicle, equipment or part
Approval Number	Text	20	Yes	
Approval Date	Date		Yes	
Comment	Text	100	No	Any remarks for the stored document

An attribute of "Fixed List" type enables the user to choose exactly one value from a list of given values (combo box). The main administrator shall update the list.

Additional attributes (as requested by some CPs) could be inserted, if necessary, at a further step. Examples are "Technical Service Report Number", "Vehicle Category", "Approval Withdrawal", "Amendment of Regulation", ...

For traceability reasons, it is recommended that DETA should use internal attributes, such as:

Name	Type	Length	Required	Remarks
Document ID	Number		Automatic	The unique document number
Create User	Text		Automatic	Name of the user who has created the document
Creation Date	Timestamp		Automatic	
Modify User	Text		Automatic	Name of the user who has modified the document or document attributes
Modify Date	Timestamp		Automatic	

### 3.2.2 System and Document Security

For the access to DETA, each user shall be defined in the system. Each user shall be assigned to one single access group.

The DETA system shall have a main administrator (UNECE). His task is to manage the access groups. For each CP, one single access group shall be defined. For each access group, the main administrator shall define a group administrator who is responsible for his access group.

The group administrator has the permission to manage the users of his access group. Each user of a group may have the right either to read only (R) or to create or update documents (R/W) of his nation. It is obvious that a user with R/W can only store type approval documents granted by the TAA of his CP.

As a result of the questionnaire, each user shall have read rights to all documents stored in DETA (even type approval documentation according to Regulations that his administration is not applying).

Additional user groups (e.g. technical services, registration departments, police departments) can be defined to DETA. They can have different access rights. The respective group administrator shall manage these user groups. For example, it could be possible to define a user group "Technical Service Nation A" which should have only read access to documents stored by the CP of Nation A.

### 3.2.3 Management of Documents

Each document in DETA has several search attributes and right definitions. Each document consists of one or more document parts (the effective document files).

To manage documents, a user interface shall be available where authorized users can store or update documents or document information. For example, a user of the German KBA can only use the nation code "E1" and can only submit type approval documentation with "E1" symbol.

Main management function of DETA is to create a new document.

While creating a new document, all attributes, as listed in paragraph 3.2.1 above, shall be entered in DETA. Some attributes have rules, so the user can only choose special contents (e.g. a French user can only store document with "E2" symbol).

In a further step, the PDF file(s) which have to be attached have to be specified.

Then the document is stored together with proper access rights. The user has the possibility to change the access rights, if needed. So, it is possible to store

documents without read access to all users and, later, to change these access rights to common read access.

To store a lot of documents in DETA in a single step, a mass upload function is necessary. In this case, a TAA can provide a lot of documentation with search attributes (e.g. in XML format) and DETA shall load these document in the archive. As a result of the evaluation of the replies to the questionnaire, DETA shall start, in a first step, without such a mass upload function.

Other electronic interfaces (e.g. to IT systems at the TAA) are not planned.

All documents shall remain indefinitely in DETA.

### **3.2.4 Retrieval of Documents**

For the retrieval of documents, DETA shall have an Internet access for all defined (authorized) users. The user can define one or more search criteria's and DETA shall show a result table of documents found. Rules for search attributes shall depend on the defined access rights of the user's group.

The user shall have the possibility to display or store the retrieved documents on his workstation or to print them out on his printer. For that purpose, one or more search results can be copied into a basket and then completely printed out or saved to the local computer. The basket has a similar functionality as the Windows basket.

Mass-download function shall not be allowed.

### **3.2.5 Other Function (no DETA Requirement)**

The DETA system can also provide, in a future step, a function such as an Regulation Interpretation Bulletin Board, as described in informal document No. WP.29-134-23. With the help of such a function, each user can leave a short message for one or more users of the DETA system. All relevant messages will be shown at startup of DETA. All messages shall have an expiration date. Messages can be created and managed by users with writing rights or by an administrator. In a first step, DETA should not yet include such a function for interpretation discussions.



### 3.3 Quantity Structure

#### 3.3.1 Document Size and Disk Capacity

Informal document No. WP.29-134-23 assumes storage of 200 pdf files per day with 0.5 MB each. This results in approximately 100 MB/day or 25-30 GB/year.

As a result of the evaluation of the replies to the questionnaire, the actual need of capacity for the storage of DETA documentation is as follows:

Document	Size
Communication Document	100 to 300 kB
Communication Document and Information Document	500 to 1000 kB
Communication Document, Information Document and Appendixes	1000 to 1500 kB
Communication Document, Information Document, Appendixes and Test Report	1500 to 2500 kB

According to the replies to the questionnaire, the total amount of documents will be about 30,000 documents a year. This leads to a total amount of disk capacity of:

Document stored in DETA	Disk capacity each year
Communication Document	3 to 9 GB/year
Communication Document and Information Document	15 to 30 GB/year
Communication Document, Information Document and Appendixes	30 to 45 GB/year
Communication Document, Information Document, Appendixes and Test Report	45 to 75 GB/year

For the following technical requirements, the assumption is in total 100 GB for the storage of new documents in a year. A range from 50 GB to 200 GB will have a small effect on cost calculation.

At the productive startup of DETA, no initial load-up of former documents will be done.

Each CP using the DETA system shall store all new documents in DETA, beginning at a specified date the CP can choose.

### 3.3.2 Number of Users

As a result of the questionnaire

- less than 20 users each CP shall have read access (200 users in total) and
- less than 10 users each CP shall have read/write access (100 users in total).

With this DETA shall be able to handle 500 users in the first step. If (in a further step) other user groups would be added to DETA the system should be designed to handle 1000 to 2000 users.

Approximately there will be 100 users at the same time working with DETA.

### 3.4 Technical Requirements

DETA will be a central managed system. The service provider shall:

- run the system
- maintain the system
- monitor and improve the system
- provide 2<sup>nd</sup> level support

The end user support (1<sup>st</sup> level support, user help desk) shall be provided by the group administrator of each CP.

#### 3.4.1 WEB Center Requirements

DETA shall run in an internet WEB center. Clients shall have access using public Internet. All security requirements shall be observed. Operating time and error response time shall be observed.

Following service levels and technical requirements shall be provided by the service provider:

Description	Requirement
Operating Time	24 hours a day, 365 day a year
Restart Time in case of hardware failure	2 hours. A mirrored database is required (RAID level 1)
Disaster Recovery: Restart time in case sabotage occurs	2 days
Allowed down-time for maintenance	Allowed but to be arranged with master administrator at UNECE.
Backup	Only online. 1 backup per day.
Backup sets	It shall be possible to recover only the last database contents.
Security architecture	At least a 2-Tier architecture is necessary.
Internet connection speed	>= 4 Mb/s
Reporting	Availability at internet interface Response time for queries Activity (retrievals, updates, users)

DETA shall be operational in any WEB Center which supports the requirements shown above. Depending on the requested restart time, a mirrored database in two locations is necessary. Depending on security requirements, at least a 2-Tier architecture is necessary.

### 3.4.2 Client Requirements

Each defined user shall have access to DETA using public Internet. The application has to run in any WEB browser. The only allowed protocol is HTTPS (Port 434). For the user interface only HTML and Java Script is allowed.

To access DETA a user shall enter an user-id and a password. Additional methods for user identification (e.g. client certificates, chip cards, ...) may be included. As a result of the replies to the questionnaire, only the password method should be realized for the startup of DETA.

The only language supported by DETA for user interface and database contents shall be English.

The actual TypMaster/DD system, on which ETEAS is based on, is using a JAVA application on the client PC. However, the new DETA system shall have a HTML based client. This is the main technical change for TypMaster/DD.

### 3.4.3 2<sup>nd</sup> Level Help Desk Requirements

In each CP using DETA, there shall be a group administrator ensuring the support for his users. He is the contact person for all users in his CP (1<sup>st</sup> level help desk). In case he cannot solve a user's problem, a 2<sup>nd</sup> level help desk shall help. This 2<sup>nd</sup> level help desk shall be provided by the service provider who operates the system.

Requirements for 2<sup>nd</sup> Level Help Desk:

Description	Requirement
Amount of group administrators who can access the help desk	one administrator for each TAA approximately 50 persons
Response time (time from income of a call until acceptance of a call)	1 hour
Service time	8:00 to 17:00 CET on working days
Access method	Email only
Languages	English only
Reporting	Response time Error correction time Call statistics

The operation of the DETA system and the 2<sup>nd</sup> Level Help Desk may be provided by two different companies. However, it is recommended that both services remain in the same company. This will improve the service quality and reduces costs.

For clarification:

The task of the 1<sup>st</sup> Level Help Desk is to provide on-site-assistance for the end users. This help desk person is an extra skilled user of each CP, normally the group administrator of the CP.

The task of the 2<sup>nd</sup> Level Help Desk is to provide administrative assistance for the 1<sup>st</sup> Level Help Desk persons and for the UNECE administrator. Important is the availability of this help desk to guarantee the requirements (see above). Another task is to contact the service provider for any technical issues (e.g. database overflow).

The task of the service provider (generally called 3<sup>rd</sup> Level Help Desk) is to operate and maintain the system and to provide technical assistance for the 2<sup>nd</sup> Level Help Desk.

These requirements cannot be supported by a public internet service provider (e.g. AOL, T-Online, ...), but there are some providers who have specialized offering for these requirements.

### **3.5 Administrative Requirements**

For management purposes, the following administrative functions shall be available:

- **User Administration:** This function shows all users registered in DETA and allows the main administrator to manage these users. The rights to manage users depend on administration level. The main administrator can manage all users and the group administrator can only manage users of his group. DETA users are organized in a tree structure:
  - Client (e.g. UNECE)
  - Department (e.g. CPs)
  - Team (e.g. TAA, Technical Service, ...)
- **Group Administration:** This function shows the access groups and the assigned users. The main administrator can manage all groups and a group administrator can manage his own group. This function is used to assign users to groups.
- **Archive Attribute Administration:** With this function, the main administrator can manage archive attributes of Fixed List Type.

For statistical purposes, DETA shall have a report function to show user activities on the system. The report shall have an option to filter by CPs or users, by activity type (reading or writing) and by date.

## 4 Feasibility

The creation of a Database for the Exchange of Type Approval (DETA) documentation is technically feasible and shall fulfill all the technical and administrative requirements of this study (chapter 3).

## 5 Costs

### 5.1 Start-up Costs

Costs which are occurring only once for the start-up:

- License fee for TypMaster/DD.
- Changing the right structure according to the requirements.
- Changing some administration function.
- Disable unnecessary functions.
- Changing from JAVA to HTML user interface.
- Installing, customizing and roll-out of DETA.
- Administrator and/or end user training.

Total costs will be in the range from 50,000 € to 150,000 € depending on final specification of changes and required roll-out services.

### 5.2 Operating Costs

Operating costs are:

- Operate the system DETA in the WEB Center under conditions specified in chapter "3.4.1 WEB Center Requirements".
- Monitor the system DETA to ensure service quality (e.g. monitoring of the database fill level, ...).
- Operate an Help Desk under conditions specified in chapter "3.4.3 2<sup>nd</sup> Level Help Desk Requirements".

These costs will be ranging from 5,000 €/month to 15,000 €/month for operating the system depending on the chosen service provider. Another important factor is the duration of the service contract because of hardware investment and amortization. It is recommended to conclude a contract for a minimum duration of 3 years.

The costs for operating the 2<sup>nd</sup> Level Help Desk will also be in the same range (5,000 to 15,000 €/month). They can be reduced if WEB Center (service provider) and Help Desk are provided by the same company.

### 5.3 Financing Models

With regard to the above-mentioned costs, WP.29 would have to consider appropriate financing models.