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Energy Efficiency Compliant Products 2 - EEPLIANT 2 - GA N°752591

Work Package 3 – Data Storage

Annex 1: Data Capturing and Storage System – Specification

1 Introduction

The project MSTyr15 included the development of a data capturing and storage system to assist the market surveillance inspectors in their inspections of tyres. The elements in this system are a tablet with dedicated software (an "app") and an online database. The database can be accessed via the app or via a web interface.

EEPLIANT 2, Work Package 3 has the task to further develop this system so it can be used for other product groups than tyres, first and foremost those covered by WP4, 5 and 6 (home refrigeration, standby products and professional refrigeration).

This document describes the existing data capturing and storage system and the ideas for the further development. It will be annexed to the call for tender to provide potential tenderers with a base for preparing a quotation. It is anticipated that the document will evolve further once a contractor has been selected and the development process starts.

2 The existing system

The market surveillance work of the project MSTyr15 includes inspection of energy labels for some 10 – 15.000 different tyres in the participating EU Member States. To coordinate this and to capture the results in an efficient way, the inspectors were equipped with tablets with a pre-installed app that would guide them through the inspection by prompting the inspector for the necessary information. This information was carefully selected with an eye on the ICSMS template so it was possible to immediately map the information with the relevant fields in the ICSMS system, thereby enabling an easy transfer of data to ICSMS at a later stage.

The overall layout of the system is shown in figure 1. The system consists of three elements:

- A tablet with an app installed.

  The tablet could be any kind of Android device (smartphone, phablet or tablet) with a mobile data connection.

  The app allows the user to create a new case (i.e. to register a new inspection of a tyre) or to view existing cases ("my cases" or "all cases"). The app has some basic search facilities (by country, by inspector or by model name).

  Data is only stored temporarily in the tablet. The tablet is supposed to be connected to the online database at all times so all inspectors will have immediate access to updated information.

- An online database.

  The database stores all data captured by the inspectors in a format that is compatible with ICSMS. Development of a facility for bulk upload of data to ICSMS is pending waiting the go-ahead from ICSMS Management (DG GROW).

- A web interface to the database

  The database has a web interface that can be accessed via a URL on the internet. It resembles the app when seen from the user and it is platform neutral, any device with a browser can be used. Users can enter data the same way as entered via the tablets or they can download data for further analysis and local storage.

(Beside these three elements is a web module with system administration facilities.)

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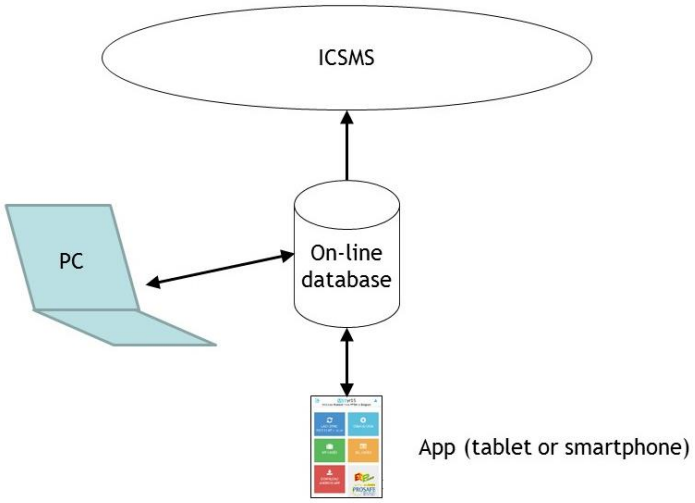

Figure 1: Structure of MSTyr15 data collection system

The data collection works in the way that the inspector uses the app to collect data when he is inspecting a tyre. The app guides the inspector through the process and ensures that data are appropriately registered and saved. The inspector can take pictures (of labels or documents) and annex to the case.

When the inspector has ended the registration of a set of data and saves it, the information is automatically uploaded to the online database.

If the inspector wants to search for a case, the search is done in the online database and only the result is downloaded to the tablet. This ensures that the inspector will always search in the updated data set.

The app's user interface is shown in figure 2. It is similar to the user interface of the web application.

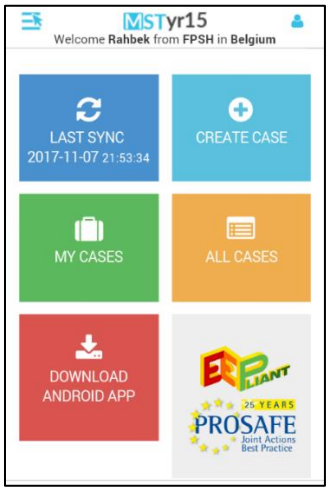

Figure 2: The user interface of the app

Figure 3 shows the main components in the app:

- A "skin" or an interface that is customised to inspection of tyres. The "skin" module ensures that the inspector is prompted for the relevant information with questions that apply specifically to inspection of tyres. The "skin" includes search functionality.

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- An ICSMS template module. This module ensures that data are stored in an internal temporary data storage in a format that is compatible with ICSMS.
- A data transfer module that handles the transfer of data to and from the online database.

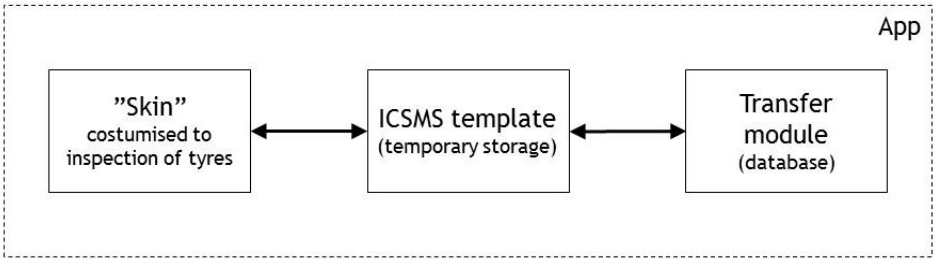


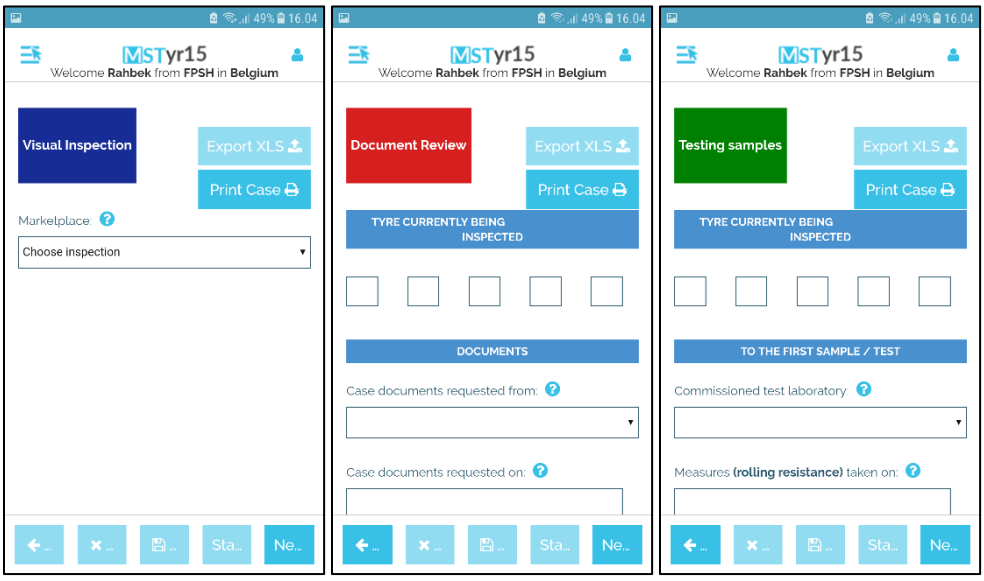
Figure 3: Main components in the app

Access to the app and the web application is restricted and requires a user-ID and a password that is obtained from PROSAFE.

Below is a short description of the main functions in the skin for inspection of tyres to give an impression of the complexity of the app and the frontend of the database:

- The dark blue button ("Last sync") will start a synchronisation of the database in the tablet with the online database.
- The pale blue button ("Create case") takes the use through four steps to record data (please see figure 4):
    - Register information linked to visual inspection of the tyre;
    - Register information linked to review of the technical documentation for the tyre;
    - Register information linked to testing of the tyre;
    - Register information linked to enforcement actions towards that tyre.

  Some of these windows contain so much information that the user has to scroll downwards to see it. An example is shown in the bottom right window in figure 4 that shows some additional fields in the document review window (top row middle window). You will see that the app includes a facility for upload of documents during the inspection.



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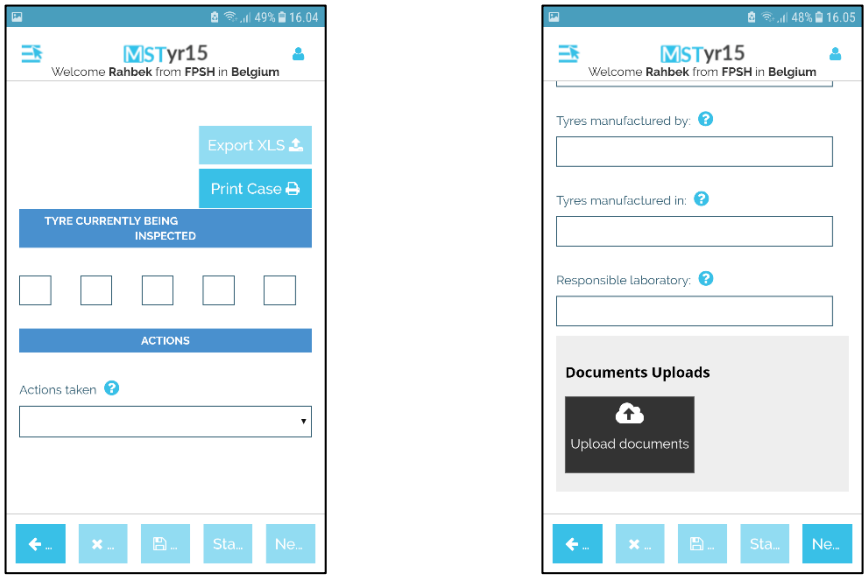

Figure 4: Registering results from inspection of a case (a tyre)

The five small blue buttons in the bottom of the screens are (left to right):

- "Previous" (shifts to the previous screen in the sequence);
- "Delete" (a case – only possible for own cases);
- "Save" or "Edit" (case);
- "Status" (for the case);
- "Next step" (shifts to the next screen in the sequence).

- The green button ("My Cases") and the yellow button ("All cases") open a search window (figure 5).

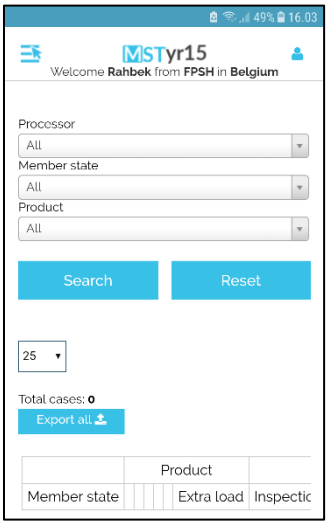

Figure 5: Search window in app

The information is presented in windows that are very similar to those shown in figure 4.

- The red button ("Download app") will download the app to the tablet.
- The last "button" just displays the PROSAFE logo.

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3 Next developments - the "product vision"

The intention is to modify the tool so it can accommodate other product categories than tyres, first and foremost the EEPLAINT 2 products (home refrigeration, standby products and professional refrigeration). However, such a tool would be useful for many different market surveillance applications, so next generation of the tool should ideally have a broader perspective than just these product categories.

3.1 The tablet and the app

In the long term, the tablet and the app could become the inspector's new writing pad and replace pen and paper. It could also replace the camera that many inspectors carry around. Cameras in most modern tablets and smartphones are at least as good as most pocket cameras. The integral camera would enable a seamless inclusion of photographs in the inspector's work.

In addition, such a tool should also store "toolkits" for the different product groups. These "kits" consist of different useful documents such as checklists, reporting forms for different types of inspections, copies of relevant legislation, guidance documents, standards, examples of energy labels and other documents that an inspector may need during an inspection. Some of these are "read-only" documents. Others are templates that the inspector will fill in and store on the tablet linked to the case.

A possible structure of the next-generation app is shown in figure 6. The core of the app will still be the ICSMS template and the data transfer module. "In front" of these, you still find the "skins". The difference is that the next-generation app will have more "skins", one for each product group, specifically adapted to the special requirements of that particular product group.

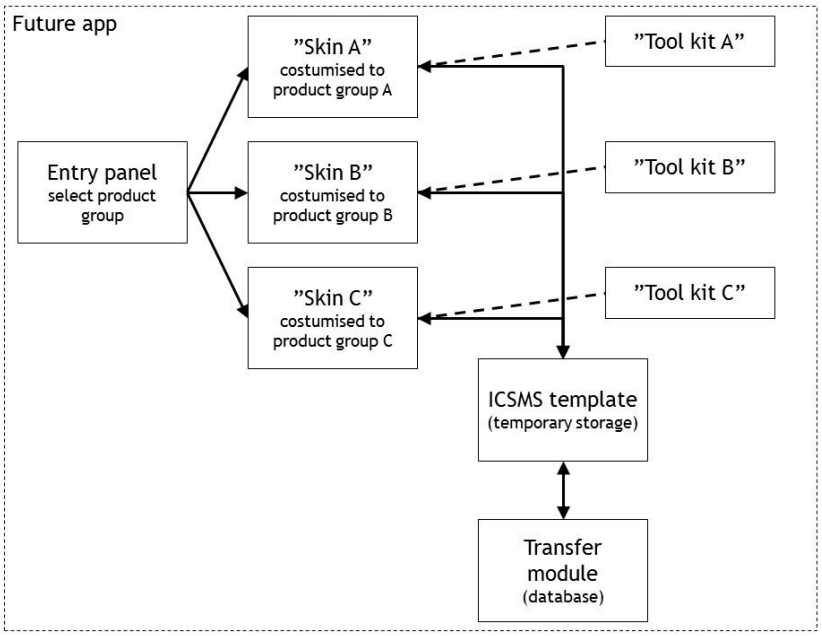

Figure 6: Main components in the next-generation app

Looking at the entry panel at the app, one could imagine that it would have a few new "buttons" compared to the existing user interface. Figure 7 shows a possible design where the original six buttons have been replaced by eight new ones:

- The top red buttons allows the inspector to select the product group to be inspected (e.g. "Tyres", "Refrigerators", "Energy labels", etc.). When the inspector has chosen a product category, the text in the button changes from "SELECT PRODUCT" to displaying the name of the chosen product category.

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- The three buttons in the next row allow the user to select "all cases", "my cases" or "create new case" (for the particular product category). If the inspector hasn't selected a product category, these three buttons are "greyed out".
- The button "TOOLKIT" opens a panel where the inspector can choose between the different documents that are available for the toolkit for that particular product group. If the inspector hasn't selected a product category, this button is "greyed out".
- In the bottom of the entry panel, you have buttons with links to the websites of PROSAFE, the EEPLIANT project and the European Commission, DG ENER.

Further to these buttons, the panel displays an icon with three lines and a small arrow head (top left corner) that opens a menu with one item, "synchronise". Others items may be added later.

In the top right corner is a small icon of a person. It directs the user to a panel where the user can edit his user profile data (password, name, address, etc.).

Figure 7: Possible new user interface to the app ("entry panel")

These ideas imply that the next-generation app will need to be updated whenever a new product group is taken on board and new "skins" and "tool kits" are created. Today, update of the app is difficult because it requires the user to download the app from a website and not from Google Play store. It means that the user has to bypass the safety software of the mobile device temporarily because it normally only allows the user to install apps from the official store. This makes maintenance of this app much more complicated compared to other apps that update almost automatically. One immediate solution to this could be to distribute the app through the app store. This will mean that anybody could download the app, but they would still have to obtain user-ID and password from PROSAFE, which would prevent outsiders from getting access to data.

This project should develop "skins" for the three product categories targeted by WP4, 5 and 6. These "skins" will be similar in structure and complexity to the MSTYR15 "skin".

3.2 The database and the web interface

The database and the web interface must be updated to accommodate the next generation of the app. This includes enhanced import and export functions as well as the possibility to use the web interface offline to enter inspection results that subsequently can be uploaded to the database.

3.3 Web interface - system administration module

The IT tool must also have system administration facilities to allow administration of user accounts access rights, toolkits and "skins".

It could have the form of a separate web interface with its own database (with users, their accesses, etc.).

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4 Ideas for further development of the tool - "product backlog"

The tables below list the ideas for the next generation of the IT tool. The tables describe ideas for the app, ideas for the database and web interface and ideas for the system administration module respectively.

Each idea is identified with a number followed by a short description and some further remarks. The fourth column contains draft priorities of the ideas on a 4-level scale: Mandatory – High – Medium – Low. The tables and the priorities will have to be discussed with Member States and the software house during the development process so the list is subject to change: Ideas may be added, ideas may be removed and priorities may change during the development phase.

4.1 App

No.	Description of function	Further remarks	Priority
APP 01	The app should be available through the Apple App store and Google Play store.	It implies that the app can be updated automatically.	Mandatory
APP 02	Develop the app to IOS and Windows.		Mandatory
APP 03	Optimise the app to (big) smartphones (with 5½ - 6 inch screens).		Mandatory
APP 04	Copy case button	Should be accessible from all panels where cases are displayed.	Medium
APP 05	Quicktype or Next Word functionality	The app should employ "Quicktype" or "Next-word" functionality in some of the fields (e.g. manufacturers and model names) to support the inspector and remove typos.	High
		It should be possible to enter the main manufacturers in the app from the beginning of a project to quickly benefit from Quicktype and Next Word functionality.	High
APP 06	Modified "Back" functionality	The “back” button (on Android devices) should take the user back to the previous page inside the app and not close the app.	High
APP 07	Consistent and transparent search function	Search criteria should be clearly displayed when selected. "Reset" should reset search criteria to default values. "All cases" should always display all cases independently from previous searches. "My cases" should always show all cases for the user that is logged in independently from previous searches. Please also see DB07.	Mandatory
APP 08	Enhanced search functionality	The user should be able to select country, inspector and manufacturer to search for particular models.	High

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No.	Description of function	Further remarks	Priority
		Free text search should be possible.	Medium
APP 09	Enhanced display functionality	The app should be able to display the cases selected by the inspector sorted in different ways according to the user's needs.	Medium
		The app should be able to find and present those cases from any country or authority for which testing is being done or technical documentation has been requested. (Other options may arise.)	Medium
APP 10	Extra free text field (uploaded to ICSMS)		Medium
APP 11	Extra free text field (**not** uploaded to ICSMS)		Low
APP 12	Notification functionality	For some product groups it would be relevant that the app could notify the inspector about a non-compliant product during the inspection, for example: • Products in certain energy classes that are not allowed. • Products that fail simple checks like "if the product is class A+, the efficiency should be at least X%". Would require an interface (at system administration level) for entering constraints linked to specific fields – potentially multiple fields.	Low
APP 13	Print function	The inspector should be able to print a completed inspection reports or other documents on the spot during inspections. Requires a portable printer that can connect to the tablet.	Low
APP 14	Email function	The inspector should be able to email documents to e.g. a business operator.	Low
APP 15	Automatic data capture using the camera	The app should be able to scan barcodes and QR codes and look them up on the internet.	Medium
		The app should employ character recognition to allow easy pick-up of data from nameplates.	Medium
		The inspector should be able to take pictures with the tablet and insert them in the reporting form.	High

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4.2 The database and the web interface

No.	Description of function	Further remarks	Priority
DB 01	Re-design of entry panel	The entry panel must be modified so the user can select a specific product category. It is preferable that it resembles the entry panel of the app.	Mandatory
DB 02	ICSMS export facility	Via the dedicated import module provided by the ICSMS consortium.	Mandatory
DB 03	It must be possible to use the web interface offline	An inspector should be able to enter inspection results via an offline laptop and upload them to the database when the laptop is online again. As an alternative, the user should be able to generate an Excel spreadsheet version of the tablet template to allow inspectors to work and report inspection results offline and upload data at a timing that suited them.	Medium
DB 04	Super user facilities	A "Super user" should be able to manipulate all cases from all users from a certain authority and/or country.	High
DB 05	The web interface should work on all major browsers (Internet Explorer, Chrome, Firefox, Mozilla, Safari, etc.).		Mandatory
DB 06	Support tool for data export	The database must enable an easy export of data to other IT systems, for instance via an Excel interface. (Excel export function already exists.)	High
		It might require development of a web tool that will support a low level of conversion like a simple mapping of cell headers in the two databases.	Medium
		It must be possible to export data in .csv-format (comma-separated file).	High
DB 07	Consistent and transparent search function working	Search criteria should be clearly displayed when set. "Reset" should reset search criteria to default values. "All cases" should always display all cases independently from previous searches. "My cases" should always show all cases for the user that is logged in. Please also see APP 07.	Mandatory

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4.3 System administration module

No.	Description of function	Further remarks	Priority
SYS 01	Administration of user accounts	E.g. creating a new user, deleting an existing user, reset of passwords.	Mandatory
SYS 02	Administration of user accesses	Which product categories should a specific user be able to see when logging in?	Mandatory
SYS 03	Administration of toolkits	E.g. uploading, modifying and deleting toolkits.	High
SYS 04	Administration of "skins"	E.g. uploading, modifying and deleting "skins".	Medium
SYS 05	Development of "skins"	E.g. create, copy or clone new "skins". (Depends upon the complexity of the task. Could be easier if we have a default "skin" that is easily adjustable in terms of colours and contents.)	Low

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