

Task 1.3.

Assessment of the research state at the local level related to the European trends and demand analysis

PURPOSE

According to the DoW in order to fully understand the potential of the RCs it's important to evaluate on one side their position related to the research and innovation trends recorded in Europe and to the general state of R&TI, and on the other side the distance from the innovation demand perceived on the local market.

To achieve these results, it is necessary to define and to analyze the existent knowledge about the state of the European research on the specific topic of urban logistics.

This is the first part of the activity to be developed within tasks 1.3.

A specific integration will be made analyzing the trends in two main fields which represent important support technology for the urban logistics, that is the ICT and the vehicle technologies (with particular respect to electric vehicles).

Moreover the planning documents of the main Bodies in charge of technological development, namely:

- *Europe 2020 Strategy with his Flagship Initiative "Innovation Union";*
- *The existing regional R&TI policies, plans and activities, their evolution and their impact;*
- *The existing national R&TI policies and support initiatives*

will be deeply analyzed by UCV in order to prepare a reference for the evaluation of the position of each RC compared to the EU Position.

The second phase of the activities will be to prepare a document describing the position of the RCs activities with respect to this reference framework; this will be done according to the methodology developed under task 1.1 and the information collected in task 1.2 about the local situation in the Regions..

This analysis will give the possibility to characterize the specific context of the RCs with respect to the external reality in a transnational context, as the one targeted by the RCs actions should be.

The outcome of the work will be a report containing the above mentioned analysis and the results of the comparative positioning analysis.

1. ORGANIZATION OF THE ACTIVITIES RELATED TO THE ASSESSMENT OF THE STATE OF THE ART (FIRST PHASE)

According to the methodology document assessed in task 1.1 and the subsequent segmentation of the research area the following matrix describes all the technology and products to be analysed; in the same way each Technology field has been assigned to Partners in order to perform the data collection and the preparation of synthetic status of the art of each Technological field.

	General Tech field	Specific Technology	Partner in charge
1	Freight distribution management systems	Simple software systems	FRI/LIB
		Fleet management systems	
		Integrated distribution management systems	
2	Special hardware for distribution management	Palm top for delivery management	LIB
		On-board devices for freight vehicles	
3	Special software for freight distribution systems	Software tools for freight distribution optimization	MOV
4	Support systems for regulation schemes	Access control management / charging systems	IPN
		Parking management / charging systems	
		Permissions release and management systems	
5	Automatic warehousing systems and handling systems	Warehousing systems	FRI
		Handling and picking systems and equipment	
		Loading / unloading systems and equipment	
		Automatic weight / dimension measurement equipment	
		Automatic labeling machines	

	General Tech field	Specific Technology	Partner in charge
6	Storage systems for transport	Storage systems for transport	UPV
7	Non-conventional vehicles	Application of electric vehicles to freight distribution	UPV/PE
		Application of other non-conventional vehicles	
8	Engineering and management	New regulation schemes	MET
		New distribution process schemes	
9	E-commerce platforms	Platforms addressed by specific operators to the end users for on-line buying	IPA/DMG
		Platforms b2b addressed by specific companies to other companies, shopkeepers, and other business subjects used for purchasing and managing orders and shipment	
10	Electronic devices for goods and vehicles tracking	Barcode systems	IPN
		RFID systems	
		GPS systems	
		Wi-Fi systems	

Moreover UCV is going to prepare a document related to the general European situation taking into the account: the planning documents of the main Bodies in charge of technological development, namely:

- Europe 2020 Strategy with his Flagship Initiative “Innovation Union”;
- The existing regional R&TI policies, plans and activities, their evolution and their impact;
- The existing national R&TI policies and support initiatives.

DESCRIPTION OF THE ACTIVITIES

Each partner has to develop the activities assigned by the task leader according to the following scheme:

1. Data collection of the documents produced within within several European Programs, Civitas, CiTylog, Smartset Bestfact etcetera. Moreover the availability of advanced products and solutions on the market should be generally taken into account. This activity should lead to identify the most important and advanced technologies / solutions and the general situation of the sector in Europe
2. Preparation of the documentation which will be constituted of two parts:
 - 2.1. A short synthesis of the general situation related to the specific technological field (descriptive)
 - General Concept / Content
 - Possible integration with other technologies (within the same tech field)
 - Main applications in EU,
 - Research and technology development.
 - 2.2. For the most important technologies / application a specific record containing:
 - Description of the technology / solution (working principle, technical characteristics, etc.)
 - Main application in Europe experiences
 - Results of the applications done
 - Perceived potential
 - RTD activities in progress, if any

The annex template shows which are the main information to be collected.

Annex 1

Task 1.3: Assessment of the research state at the local level related to the European trends and demand analysis

Technology field: Special hardware for distribution management

(please refer to the general tech matrix developed under 1.1 task)

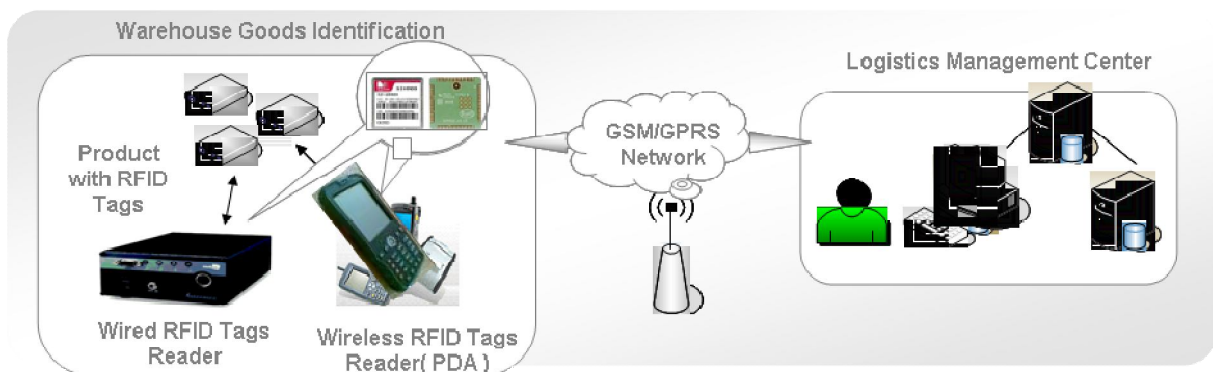
Specific technology/solution: Palm top for delivery management

(please refer to the general tech matrix developed under 1.1 task each partner for the allocated technologies)

Description of the technology/solution:

Palmtop, portable devices or PDA are a part of a major system, that is the integrated distribution management system. PDAs are used mainly to:

- support communication between the operator (from sales associates and warehouse workers to delivery drivers and field service technicians) and a central control unit, in charge to supervise, control and optimize distribution services
- collect "on site" (stops, specific areas of warehouses...) information about different activities performed within a supply chain, first of all deliveries.



(source: <http://wm.sim.com/casesen.aspx?id=5>)

All PDAs have those characteristics necessary to support work operations in any different environment: rugged, rain and dust resistant, wide operating temperature range small and lightweight, rechargeable long life batteries, tactical keypad, software and enhanced connectivity (compatibility with application software, communication or peripherals), memory and storage (Flash-Rom, RAM and micro-SD).

More specific technical characteristics vary according to required functionalities:

- display: dimension and resolution vary according to customer needs

- communication: telephone, SMS, text, dual band 802.11 b/g/n and Bluetooth Class II to provide optimal network coverage and support voice and data communication
- audio/video: high quality audio (voice-directed workflow) and video (mega pixel cameras, imaging-based data extraction) to support data collection and transmission, surveillance of on-site operations
- scanning performance: capability to scan 1D and 2D bar code, PDF, DataMatrix and UPC codes in all lighting conditions, up to 30cm distance and 35 degree angle
- UHF RFID reader, (different frequency ranges: 865, 915, 950 MHz bands...)



(source: <http://www.intermec.com/products>)

Portable devices for freight distribution management could be designed and developed to support specific operations, as for example:

- bar code readers: 1D or 2D bar codes, more or less tolerance for in motion scan, different scanning allowed distance, wireless communication
- RFID readers and printers: multiple frequency bands passive UHF RFID reader, even associated with time stamps and location, thanks to different wireless technologies (RFID, Wireless WAN, GPS, Wi-Fi and Bluetooth)
- printers: label/RFID/bar code printers, secured wireless communication (Bluetooth, 802.11, serial, USB)



(source: <http://www.intermec.com/products>)

Main applications:

(referring to urban logistics field)

Main application of PDA is the management of on-site operations, including first of all deliveries: in this specific case, personnel (driver) can record and share with customer if necessary, all relevant information as exact delivery time or goods/package consistency with expected provision (integrity of package, number of packages, weight of goods, temperature of goods particularly important for restaurant/market/food chains). According to delivery of

products, operator (driver) can also print and give the customer a receipt/billing/invoice and register a signature for delivery acceptance.

PDA have different other application, as for example within the warehouses, where it could be important to place and read information (bar code scanning, labelling) and/or receive/transmit data (picking approval, priority level...).

The most extended application of PDA can support also tracking and tracing of vehicles (GPS and GPRS systems), registration and transmission of data useful to remotely optimize routes and sequence of loading/unloading stops in real time, control drivers behaviour or respect of expected products picking/delivery, real time provision of updates/information to operators/driers, remote control of goods conditions (i.e. temperature).

Use and results of applications done:

(analyse the experimentations done by cities with special regards to European programs (i.e. FP7 funded projects, Civitas and other)

Most interesting recent project related to use and capabilities of PAD is Freight Best Practice, funded by the Department for Transport and managed by AECOM to promote operational efficiency within freight operations.

The overall project covered different aspects of the supply chain, including specific analysis and test regarding use of PAD as main component of a paperless manifest and POD (Proof of Deliveries): PAD can be used, in this case, for electronic signature and linked to a communication system to transmit info to a central control unit. PDAs could also receive information for drivers (route refinement, new picking/delivering sites/scheduling), support voice or message communication, incorporate barcode scanners or in-cab printers and be linked to account system in order to support invoicing.

A case study was analyzed, with regard to British Telecom, managing up to 30.000 consignments per day, using a fleet of 300 vehicles and drivers that use PDA for most of their activities: to download daily consignment, to scan barcode to track consignments, to collect signature or to inform supervisors (and then warehouses and other operators) about problems occurred (i.e. not accepted delivery). This case study highlighted the increase of efficiency in delivering: tracking consignments, greater control of operations and bottleneck identification and elimination, accountability and productivity of drivers, fewer customer complains.

Perceived potential:

(describe the potentialities of the analysed topic in terms of future applications, impact on the process, innovation, etc.)

Use of PAD can lead to costs saving and other relevant benefit most of all for Companies/Organization with a high number of operators, even expanding the use of these devices (and the overall system) to possible sub contractors. Implementation of this system (PDAs are a part of a complex system) could be still too much expensive for small enterprises, so that its ROI could be not that positive.

Potential benefits are an even better control of individual consignments, a real time evaluation and optimization of scheduled activities and driver operations, an automatic production of statistics and analytics and an overall integration and coordination of all .

Paperless manifest and POD systems tend to be even more sophisticated in near future, with possible implementations. Possible evolution in use of PAD could lead to share with drivers (providing to or receiving from) a greater amount of information by making it easier and secure the use of PDAs and data transmission, while a link to benchmarking tools could support automatic analysis of key performance indicators related to deliveries and customer satisfaction.

On the other side, the technical evolution of smart phones could lead to use this latter devices instead of PADs, making it unnecessary.

RTD activities in progress

(describe the RTD activities in course, or the possible envisaged RTD needs)

The actual development of PDAs, aims to allow the use of the devises in most different, specific and customized functionalities: this goal requires both technological improvements (battery life, easy to use interfaces, greater number of data/activities to manage, integration to existing systems) and a better and updated integration with all possible communication channels.