



CO-EFFICIENT

COLLABORATIVE FRAMEWORK FOR
ENERGY EFFICIENT SME SYSTEMS

1C-MED12.10 CO-EFFICIENT

Collaborative framework for energy efficient SME systems

WP4 – eServices for energy efficient operations

Phase 4.4 – Co-development and testing of eServices for energy efficient operations

WP4

Output 4.4 Co-development and testing of eServices



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Author	Flavio Bonfatti, Paola Daniela Monari, Giulia Prandini, Chiara Reggiani (SATA)
Revision	Katja Hanžič (UM)



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Executive summary

This report is aimed at representing the activities carried out in Phase 4.4 and the achieved results in terms of final version of eServices as well as instructions and training materials for the use of eServices. As foreseen in the AF the co-development process have been managed and performed by SATA, being the main developer of eServices, on the basis of the indications coming from the executed pilots and the discussion with the project partners on the incoming new requirements.

The process started with collecting the user preferences and requests for modification from the five local pilots (see the documentation of pilots). The co-development was iterative, meaning that the users first indicated their preferences for modifications then the developer modified the eServices accordingly, after that another round initiated. The other involved partners were AFT, VF, RDA OBC, CNA, ITL and UM - their role was assuring the incoming of information and preferences from the users at the local level.

The Phase 4.4 output is made of two parts: (a) the final version of eServices - a complex software platform made available to the project partners and their user companies, and (b) a complete eServices documentation - instructions and training materials for their use. This report basically contains the latter part which is organised into three main chapters:

- Chapter 1 – eServices recalled
- Chapter 2 – Requests for improvement
- Chapter 3 – Instructions and materials on eServices

This report is firstly addressed to the project coordinator and to the partners managing the regional pilots as documentation of the effort spent to improve the CO-EFFICIENT eServices according to the indications coming for the training phase and the pilot experiments. It is furthermore addressed to those organisations that are interested to provide local companies with the intended eServices even after project completion and, in general, to stakeholders willing to promote innovation and competitiveness at SMEs.

1. eServices recalled

As already specified in previous documents (e.g. Output 4.1 – eServices beta version) the eServices proposed by the CO-EFFICIENT project are basically three, namely the Transports eService, the Dematerialisation eService and the Networking eService. A fourth eService on CO2 estimation has been added by initiative of some partners.

In this Chapter 1 their main functions and features are recalled so as to make the point for better explaining the raised improvement requests.

1.1 Transports eService

The Transports eService, also called Transport Consolidation eService, exploits the software platform resulting from the widely mentioned KASSETTS project (www.kassetts.eu) and successively completed and strengthened for a couple of years in collaboration with several of user companies and carriers. The Transports eService devises the collaboration of three main actors, namely Customer, Carrier and Logistic Broker:

- Customer is any organisation registered on the platform (a manufacturing or trade company, or even a transport firm) sending its transport requests to the KASSETTS platform and receiving back a proposal for transport execution.
- Carrier is a transport company registered on the platform assuring a certain transport capacity and certain prices and hence participating as candidate in the assignment of the transport missions computed by the platform itself.
- Logistic Broker is person using the platform to aggregate the incoming transport demand, help the registered Customers by planning efficient transport solutions and assign their execution to the case-by-case more convenient Carriers.

Therefore, the Logistic Broker is not acting as a new logistic operator but as a neutral intermediary subject between user companies and transport providers. This optimises transport and logistics activities, increases the competitiveness of customer SMEs in their local systems, sustains the environment and preserves regional territories from the increasing freight traffic and the consequent air pollution.

Figure 1 shows the main functions of the Transports eService.



Figure 1: The Logistic Broker conceptual scheme



- Transport request – The Transports Customer company is enabled to submit daily (even more times per day) transport requests to the Logistic Broker platform.
- Transport planning – The Broker plans the received transport requests trying to define optimised missions meeting at best the transport request parameters.
- Transport mission – The Broker analysis the estimated costs of each planned mission and tries to assign it to the qualified Carriers in increasing cost order.
- Order confirmed – The candidate Carrier must simply communicate time by time to the platform its acceptance or rejection of the proposed mission.
- Service notified – The Broker platform automatically informs the served Customers of the selected Carrier, the cost for each of them and other details.
- Periodic reporting – The Broker platform generates periodic reports on the performed Transports to every served Customer and every serving Carrier.

Concerning the planning algorithm, it assures a flexible combination of finite-capacity and infinite-capacity analysis. For instance, it is possible to start a finite-capacity planning in order to first saturate the actually available fleet, then the remaining transport requests are processed by infinite-capacity planning so as to determine the number and type of trucks needed to satisfy them to be proposed to the participant Carriers.

In synthesis, the Broker plays a simple intermediary role aimed at matching the Customer transport demand with the Carrier offer of transport services. This role is absolutely independent and neutral, and based on a limited set of transparent and well-known rules. Commercial relations and money exchange remain in the responsibility of the served and serving parties, namely Customer and Carrier.

As a matter of fact, the Transports eService provides a real win-win solution to all its users since (a) the Customer can obtain optimised transportation services at the lowest available price by sharing the same trucks with other users, while (b) the Carrier can rely on an aggregated and hence richer demand able to reduce its negotiation effort and induce a profitable economy of scale.

Main user scenarios

There are several ways to exploit the Transport eService with respect to the specific conditions of the user(s). In this subsections some of them are highlighted to show its interesting application potential in a variety of cases.

- Carrier fleet planning. The Transports eService can be conveniently used by a carrier willing to optimize the use of its vehicles. The Logistic Broker function is internal: it knows the fleet composition, receives transport orders from customers and performs time by time a finite-capacity planning to compute optimal runs. Should the transport orders overcome the fleet capacity, it can use the infinite-capacity planning to determine the vehicles to rent at subcontracted carriers.
- Customer fleet planning. The Transports eService can be similarly used by a customer (e.g. a manufacturing company) provided with its own internal fleet. Once again the Logistic Broker function is internal: it knows the fleet composition, received transport orders from shop floor or warehouse of the same company and performs a finite-capacity planning accordingly. If necessary, it performs infinite-capacity planning of the exceeding transport orders to involve external carriers.
- Aggregated run assignment. This is the most performing use of the Transports eService aimed at aggregating the transport demand from a number of customers so as to compute optimal runs and assign them to the most convenient carriers. In this case the Logistic Broker function is external to both customers and carriers, to conduct

a neutral role in applying the established rules of play. Depending on the conditions it can perform finite- and/or infinite-capacity planning.

- Simulation mode. The Transports eService can also be very conveniently used for simulation. This means computing possible missions on the basis of hypothetical transport requests and hypothetical fleets, and then deriving quantitative estimations on devised behaviours. This is useful e.g. to the Customer when trying to foresee the savings expected by hypothetical conditions, and to the Carrier when considering investments in trucks or working on the revision of its price list.

1.2 Dematerialisation eService

The Dematerialisation eService, also called Document Data Extraction eService, is based on a SATA-owned technology aimed at quasi-automatically extracting contents from PDF business documents (in particular: orders, invoices and consignment notes) and translating them into structured documents thus enabling and facilitating their electronic exchange between companies, especially SMEs, without impact on legacy systems.

Figure 2 shows the main functions of the Dematerialisation eService.

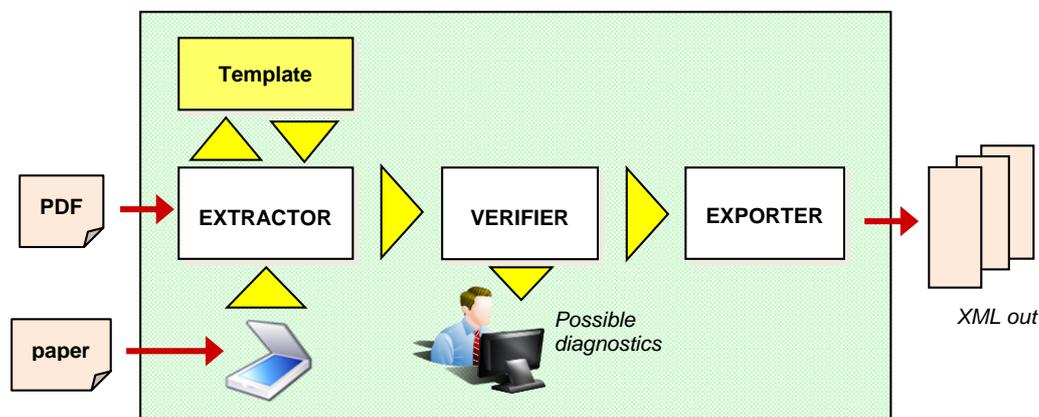


Figure 2: Functional architecture of the Dematerialisation eService

- PDF/paper. This eService accepts input files each containing one or more PDF vector (native) documents or one or more PDF raster (image) documents normally obtained by scanning paper documents. The document contained in every file must be of the sale type, namely orders, invoices or consignment notes.
- Extractor. This is the function in charge of identifying, interpreting and then extracting the information (labels, values) contained in the processed documents. In case of raster/image documents Extractor uses an integrated commercial OCR function, that is, ABBYY FineReader chosen for its high performances.
- Template. The success of the Extractor function is strongly increased if realising a template for each document at design time. Much care has been put on making template definition easy and fast, the present performance is a quasi-automatic mechanism taking 5 to 10 minutes per template.
- Verifier. Should the Extractor find possible uncertainties or inconsistencies in some extracted data, Verifier is the function to manually confirm or correct them. The Verifier is used seldom on vector documents (just to correct wrong data) while its use is required on about the 25% of raster/image documents.



- **Exporter.** Once extracted and possibly corrected the data found in a document, this function provides to translate them into the desired output format, which is normally an XML file but can also take the form of an XLS, TXT or CSV file. In doing so the Extractor applies the rules defined for the desired output.
- **XML out.** The output formats presently realised for eInvoices are the well-known Peppol and those defined in Italy (namely: FatturaPA for public administration and CBI2 for the banking circuit). Other output formats can be added with a limited effort, say, a couple of days each, under user request.

Besides playing a fundamental role in eInvoicing, the Dematerialization eService can be of paramount importance for those organisations that are interested to move towards a really dematerialised world: intercept the incoming documents and transform them at the lowest possible cost into electronic documents that can be afterwards stored in a document management system and processed by a workflow management system.

Template definition, and possibly correction, as well as correction of the fields of the single document with unclear or inconsistent values, call for a manual user intervention supported by the Verifier module. The user interface is very intuitive as it shows the original document on the right side and the list of extracted fields on the left side, with traffic lights marking each field (green=correct; yellow=uncertain; orange=wrong; red=missing).

This simple and intuitive way to express field reliability puts final users in the condition to validate documents without involving IT experts. The Italian dematerialisation experience has shown that template construction requires non-IT (preferably accountant) personnel trained for at least one week, while document correction by the Verifier function is easily done by any common users trained for about one hour.

Main user scenarios

The two basic user scenarios are (i) sending a document in different formats depending on the recipient (outbound scenario) and (ii) receiving a document and importing it automatically into the legacy system (inbound scenario).

- **Outbound scenario.** This is a 1-to-many scenario aimed at sending documents in different formats, independent of the origin format but depending on the recipient. The user registers at the eService, provides its master data and sends a sample of business documents to the eService provider who is normally in charge of preparing the template. Once initialised, the user sends time by time the document files to be processed: an automatic polling mechanism imports them and invokes the Extractor function, which is completely unmanned. At the end of each extraction and translation process, executed on one or more documents, the user is notified of the document batches already exported in the desired format(s) and/or of possible documents requiring a verification/correction activity. In Italy this scenario received a strong push from the introduction (started in 2014 and completed in March 2015) of the mandatory eInvoicing system towards the public administration, involving about 2 million suppliers and 40 million invoices per year.
- **Inbound scenario.** This is a many-to-1 scenario aimed at automatizing as much as possible the import of business documents into the user legacy system. Once again it is supposed that every received file contains one or more documents that are in PDF vector form or in raster/image form. For every input document format it is required a quasi-automatic initialisation step for the definition of its template. After that, an automatic polling mechanism intercepts the incoming files and transfers them to the Extractor function, which automatically applies the right template to every single document. The extracted data are then automatically translated into the output format (the electronic format required by the user legacy system) unless some uncertainties

are found in which cases those documents are transferred to the Verifier function for manual correction. The final (correct) electronic documents are made available in proper folders ready for importation into the legacy system or, more in general, to be processed according to a specific workflow model.

1.3 Networking eService

The Networking eService, also called the Distributed Planning eService, comes from the collaborative ICT platform created in the frame of the already mentioned eBEST project. It aims at supporting the collaboration within an SME network between the lead and the members (suppliers) in such a way to make the network behave as a larger company in terms of efficiency and reactivity, while reducing energy consumption.

The eBEST project addresses small companies (typically with less than 50 employees) providing services to other businesses, often by subcontracting, in different industrial sectors. In general these companies perform added-value manufacturing and service activities in the intermediate phases of the chain. In this context companies remain independent but contribute all together to the evolution of their business network.

Figure 3 shows the main functions of the Dematerialisation eService.

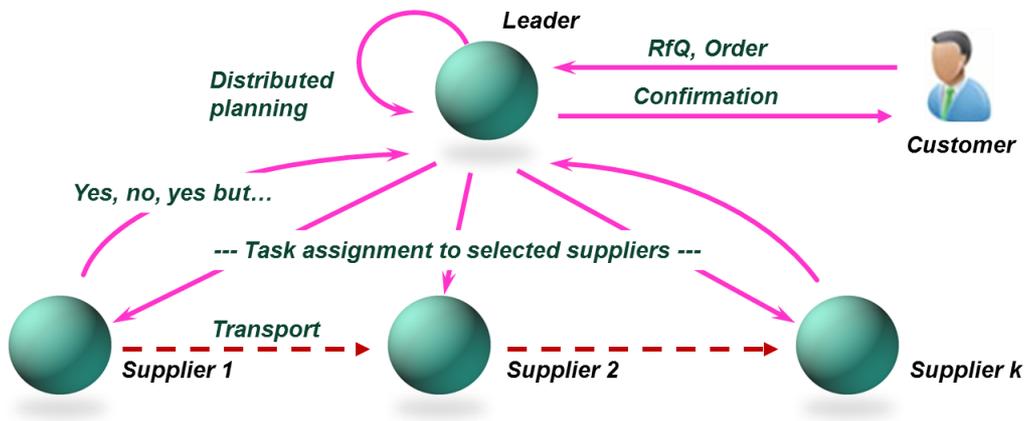


Figure 3: General schema of the Networking eService

- Customer. The Networking eService displays the eCatalogue of the products or services supplied by the network as a whole. The customer can navigate through the eCatalogue, select the desired product(s) and then submit a request for quotation or an order waiting for a quotation or order confirmation.
- Leader. The network lead company uses the Networking eService to plan the activities of the network. In case of request for quotation it simulates the process execution to derive the quotation data, in case of order it plans the activities to be assigned to the network members for order fulfilment.
- Distributed processes. A network product is realised by executing the relative network process, that is, a set of activities that can be related with each other in sequence or in parallel. The process is distributed in that every activity is associated to one or more suppliers (normally network members) that can perform it.
- Distributed planning. For each incoming order the activity planning is distributed by nature, meaning that the activities of the relative process have to be assigned to



network members for execution. In other words, distributed planning means configuring the sub-network asked to perform that process.

- **Task assignment.** Once the execution of a distributed process has been planned, the Networking eService helps communicating the assigned tasks to the involved members. If the supplier leads in turn a network it can use the same eService to plan the decomposition of its task into sub-tasks.
- **Yes, no, yes but.** Every involved member that has assigned a task must reply to the lead, by means of the Networking eService, to accept or reject it or even accept it under condition. In case of rejection the network lead must undertake a new distributed planning until the process is completely covered.
- **Transport.** Every involved member could be located in a different place with respect to the others. If so it must receive the incoming materials by a transport and forward the worked material by another transport. The Networking eService helps considering the distance as one of the critical factors in distributed planning.
- **Exception handling.** After the distributed process execution has started it may happen that something goes wrong, e.g. delay or change on quantity. This is communicated through the Networking eService to the lead company that, once again, launches the distributed planning function to damp down the perturbation.

Main user scenarios

As partially anticipated above there are two main scenarios to consider, depending on whether the user role is lead company or one of the network members, as presented in the following of this section.

- **Lead company.** The main support of the Networking eService to the lead company is in creating/updating distributed plans so as to optimise the network behaviour while assuring a balanced involvement of the network members and saving energy as far as possible. Very important, this is done by applying the rules of plays (e.g. on member skills, lead time, cost, quality, capacity and past behaviour) agreed upon within the network. Plan creation occurs whenever a customer order is received and aims at executing it in the best possible conditions taking into account the plans already released or in execution. Plan are also created to answer requests for quotation, with the difference that after the quotation has been computed the plan is cancelled (just simulation). Plan updating occurs when one of the involved members rejects the assigned task or to handle exceptions: in either cases the only affected plan fraction is cancelled and re-planned in the new conditions. It is worth recalling that among the criteria considered by the planning algorithm there is the knowledge of the past behaviour of every network member in terms of accepted and rejected tasks, caused and solved exception, and the like.
- **Network member.** The main support of the Networking eService to each network member is in organising its own (internal) activities and then answering the lead company requests. This starts with establishing an explicit relation between every activity in the distributed processes and the network members that are able to perform it, with indication of time, cost, capacity and other supply conditions. After that the eService supports the network member in communicating with the lead company at the various stages of distributed process execution. In particular it is put in the condition to raise timely possible exceptions. Finally, on the basis of the decisions taken by the planning algorithm every member can decide to improve its offer to the network so as to gain positions with respect to the other members and consequently contribute to the network success.



While planning and executing the distributed processes a large number and variety of business documents are generated and exchanged between the actors. The Networking eService facilitates and tracks these communications by assuring a complete electronic transmission including the possibility, for every party, to send documents in its own language and have it automatically translated into the receiver language.

1.4 Objective CO2 eService

This is an additional eService with respect to those considered at the project start, taking the form of a methodology and a software tool aimed at translating transport data into an estimation of generated CO2 emission and, possibly, of its reduction. More precisely, the tool intends to improve the energy efficiency in companies managing an internal fleet of trucks (bought, hired) for the transportation of their own goods.

In the Spanish case, participation of the pilot has been offered to SMEs from the transport/logistics sector. These companies consider the consumption of fuel as one of their main operational (financial and energetic) costs and so, any action focused on the improvement of their use of the fuel will have a large impact on the energy efficiency of the whole company.

The service takes advantage of the previous experience, best practices and results developed for the French program Objectif CO2, specifically the “Charter of voluntary commitments to reduce CO2 emissions from road freight transport”, which has achieved average savings of around 9% in fuel consumption for those companies that have taken part of it. The French program counts on a very mature and structured methodology that includes a series of steps which should be taken by the company with the assistance of a technician in the program.

The methodology proposes a series of proven actions for the transport sector which can be selected by the company in order to achieve energy savings. These actions fall into four different categories (vehicle, fuel, driver and organization) and the potential for each of the actions are quantified. Therefore, it is possible to know the rate of return of each of the investments necessary to carry out the minimization plan and the savings expected to be achieved at the end of its implementation.

It is a requisite for the companies participating in the program to select at least one action for each of the existing axes. It is also possible, even encouraged, to propose alternative new actions if none of the ones included in the proposed list is fitted to the company’s needs. Adherence to the program involves a commitment for three years, including an initial work of data gathering and the selection of the plan, and three audits during active years. These three years will guarantee the continuity of the Living Lab after the end of the project.

In the Spanish pilot, due to the synergies that can be found between Objectif CO2 and the Spanish Registry of Carbon Footprint (regulated through RD 163/2014), the companies have been assisted as to the best way to apply for the Spanish Label. It is expected that all the participating companies will receive the label in conclusion of this work.



2. Requests for improvement

The requests from the CO-EFFICIENT consortium partners on the eService functionalities and the possibility to improve them have been raised starting from the training phase, continuing with the installation phase and adaptation to the local languages, and increasing in number and variety during the pilot execution.

In general they had two complementary origins: direct requests from the companies testing the eServices and finding margins for possible improvements, and mediated requests from the consortium partners interpreting the user needs in the light of a wide knowledge of the local conditions and habits in the respective regions.

In this Chapter 2 the improvement requests are collected by eService and then by region with indications of the consequent co-development activities.

2.1 Transports eService

This is the eService that received more attention and therefore a larger number of requests resulting in co-developments, with the participation of all the regions.

Requests from Italy

The requests raised from the Italian partners are listed here below together with indication of the co-developed improvements:

- One request related to transports in the pharma sector, meaning systemic provision of medicines and other healthcare supports to hospitals in the Emilia-Romagna territory. The request concerned the possibility to automatically complete the incoming transportation requests that often were not including the relative packing lists. The problem was critical and came from the need, for the Transports eService, to know the number and size of packages to move in order to determine the best size of truck(s) to involve. After a careful joint analysis it was decided to introduce an offline process, based on coefficients obtained from statistical analyses of past transports, deriving the number of packages (rolls) from the number of order lines without impacting on the eService functionality.
- Another request relates with the pilot experiment carried out by ITL with a transport company and a number of user companies. The problem was the possibility to customize the transports price lists for making it strictly correspond that in force at the involved carrier. As a matter of fact every carrier uses its own model for the price list with is normally (quite) different from the structure of the others. The Transports eService includes a number of price list models but they have been considered not sufficient to grasp all the real life cases. An interesting discussion led to find out the way to model the carrier price list by means of one of the already existing models with no significant loss of information. However the request has been taken in due consideration for future price list models improvement.



Requests from Slovenia

The requests raised from the Slovenian partners are listed here below together with indication of the co-developed improvements:

- The very first request was implementing a separate instance of the Transport eService for the Slovenian pilot. The reason was the difficulty for Slovenian carriers and users to deal with an English user interface. This was done with the active collaboration of the involved partners, and the Slovenian eService instance was made available in time for user training and pilot preparation.
- Another request was around the broker profile and role. More precisely, it was asked to go deeper into the broker activities in the frame of the transport planning process so as to better understand the skills to look for and the consequent functions the Transport eService should make available depending on those skills. At the end of the discussion it was decided not to change or extend the already developed broker functions and wait for pilot experiment outcomes in order to determine if and how it would be actually necessary to introduce changes or extensions.

Requests from France

The requests raised from the French partners are listed here below together with indication of the co-developed improvements:

- The very first request was implementing a separate instance of the Transport eService for the French pilot. The reason was the difficulty for French carriers and users to deal with an English user interface. This was done with the active collaboration of the involved partners, and the French eService instance was made available in time for user training and pilot preparation.
- The second request was the introduction of a new function into the Transport eService able to compute (estimate) the amount of CO₂ generated by each transport mission according to a formula and a set of parameters proposed by AFT. This was done and the upgrade was extended to all the eService instances. By the way, this computation of CO₂ emission introduced into the Transport eService is a simplified version of the much more complex and rich solution adopted in the additional ObjectiveCO₂ eService (see).
- A third request was the introduction of a further function to automatically generate and compile the so-called "consignment letter", a document that in France is mandatory for carriers. The analysis showed that the transport data managed by the eService were sufficient to produce a correct and complete consignment document, hence the function was developed although only for the French instance.

Requests from Croatia

The requests raised from the Croatian partners are listed here below together with indication of the co-developed improvements:

- One request related to the presence, in the Transport eService, of a function helping in the truck loading stage by suggesting the most convenient storage order of packages into the truck. This could improve the efficiency of load/unload activities and then save time especially in case of missions with many stops. It was explained that such a function is not presently available since most carriers can normally decide by themselves starting from the mission plan, which contains a summary of all the stops with the load/unload operations to perform.
- Another request related to the possibility to use the Transport eService to manage exceptions occurring during the mission execution (e.g. delay, street accident or lost



material). It was explained that the eService is conceived to support the transport planning phase, then it does not include feedback from the carrier during transport performance, feedback that can however come to the broker by other channels (e.g. phone) thus triggering the relative mission re-planning. However it was decided to take the request in due consideration for future Transports eService improvement.

- A third request concerned the need for most potential users of the Transports eService to facilitate the import of transport orders from their legacy system so as to avoid a burdensome manual data entry. That import function is already available in the eService and the analysis included the construction of an example based on mapping the company legacy system data structure into the eService data structure so as to establish the correct correspondences. After that it was possible to show the automatic format transformation of the transport orders coming from that company.

Requests from Spain

The requests raised from the Spanish partners are listed here below together with indication of the co-developed improvements:

- The most important request concerned the transportation of containers, which means linking three or more trips to reflect container movement. In fact, for container transportation the truck begins a journey from a facility outside the port, and then moves to collect an empty container from a container park or to the terminal for a full container depending upon it being an export or import scenario. It then transports the container to the destination. At this point the truck goes back to the port or container park for another container or to the facility to finish the working day. Then a method is needed to record and link the partial trips into complete missions to cover all these cases. Unfortunately this problem did not easily match with the Transports eService structure, then a deep discussion took place between SATA and the Spanish partners to evaluate alternative solutions and their implementation cost and time: the final decision was to renounce to this improvement.
- In parallel with the above request there was another request to introduce price lists based on geographic zones as well as driver agendas. The former aspect concerned the possibility to compute the distance matrix based on the only zip code of the origin/destination zones. The latter aspect considered that the Transports eService way of representing the truck availability (calendar) was satisfactory and it was suggested by the Spanish partners to add a table for drivers recording information like their abilities (license type, machinery qualifications, etc.) and accumulated hours. Both requests could be fully co-developed but after renouncing to solve the related N-step container problem the interest for them declined and it was jointly decided to cancel these additional improvements.
- The last request was implementing a separate instance of the Transport eService for the Spanish pilot. The reason was the difficulty for Spanish carriers and users to deal with an English user interface. This was done with the active collaboration of the involved partners, and the Spanish eService instance was made available.



2.2 Dematerialisation eService

This is the eService that received more attention after the Transports eService, with several improvement requests resulting in co-developments and the participation of most regions.

Requests from Italy

The requests raised from the Italian partners are listed here below together with indication of the co-developed improvements:

- The first request was for extending the Dematerialisation eService functionality to support the registration into the accounting system, that is, the phase when the contents of every line in the invoice is properly classified with respect to entries of the account chart. In fact, invoice dematerialisation does not bring a full benefit unless it is possible to (quasi) automatically complete the process. The discussion with the CNA Servizi and Solving led to identify a simple yet effective approach: exploit the regularities of cost classification descending from the pair <customer, supplier>, since in most cases that paid completely identifies the entry of interest. This software improvement (extension) was quite heavy to realise but the co-developed function resulted in a very appreciated enrichment of the Dematerialisation eService.
- The second request concerned on the contrary the possibility to simplify the data extraction function for some specific cases. In principle the Dematerialisation eService extracts all the contents of the dematerialised business documents, in particular invoices. However in some cases it happened that data extraction is only finalised to obtain indexes to be used to identify and classify the document in a document management system. In those cases the extraction function must then be limited to the only data (indexes) in real interest. Also this improvement has been co-developed in collaboration with CNA Servizi and Solving.
- The third request came from Partners4Innovation (P4I), which asked to extend the data extraction capability to another business document type, namely the consignment note (DDT in Italian). The co-development consisted in developing a parallel function reusing some operations of the invoice extraction function and adding other operations on data that are present in the only DDT. Even in this case the resulting improvement was appreciated and became a further feature of the Dematerialisation eService.

Requests from Slovenia

The requests raised from the Slovenian partners are listed here below together with indication of the co-developed improvements:

- Although this eService is not to be implemented now in Slovenia, it might be deployed in the near future via the Living Lab for transport companies. Looking forward to that opportunity it was asked to develop the Dematerialisation eService output in a form that is compatible with (hence, can be imported by) present accounting programs so as to skip a useless data entry phase. This request was taken in due consideration and the eService output is also provided in a CSV format that can be easily transformed into an Excel document.



Requests from France

In the French context, some improvements were asked in order to tailor the DDE tool to the specific needs of our territory.

- The first request was to create a French version of the software, in order to ease the use of the software by the SMEs, which have, and will, accept to test it. The software contents was translated by our translator; we are currently waiting the finalization of the French version.
- A second request was made after a visit to an enterprise named Montpellier Depannage, which is working on the field of automobile assistance. Montpellier Depannage asked if it was possible to develop a functionality which would allow the extraction of some specific data from vehicles registration documents for inserting them into a database. SATA was very fast to develop this new functionality on the tool, which is currently tested with Montpellier Depannage.

Requests from Croatia

The requests raised from the Croatian partners are listed here below together with indication of the co-developed improvements:

- One request concerned the possibility to feed the Dematerialisation eService with documents (normally PDF documents) coming from different channels, in addition to manual uploading. For instance, invoices sent as attachments to emails should be intercepted and automatically passed to the data extraction function. Moreover there was the problem of opening the eService to process documents generated in paper form. The discussion went deeper into the two problems and in conclusion it was recognized that the channels already available in the eService, as well as the current practice to process scanned invoices, are fully satisfactory.
- Another request was assuring that the Dematerialisation eService can be interfaced with other software packages, in particular the commercial book keeping software. This request was merged with the similar first request from the Italian partners and the solution was co-developed with both parties.

Requests from Spain

The requests raised from the Spanish partners are listed here below together with indication of the co-developed improvements:

- The very first request was implementing a separate instance of the Dematerialisation eService for the Spanish pilot. The reason was meeting the need to work on Spanish documents with a Spanish user interface. This was done with the active collaboration of the involved Spanish partners.
- Following the above implementation, the next request was introducing the Spanish lexicon of terms used in the business documents to process. As a matter of fact, extracting document contents implies identifying and understanding both the document labels and the associated values. And in order to understand those labels a vocabulary of terms is needed with their semantics (meaning) annotated. The Dematerialisation eService is already provided with the English and Italian vocabularies, the Spanish partners provided their own vocabulary for installation onto the Spanish eService instance. Since the decision to exploit this eService has come late in Spain, the installation of the Spanish vocabulary is still in progress.
- Another request arose from the users not very interested to process invoices while needing a data extraction middleware between logistic SME and their ERPs as well as integration with port community systems (in particular valenciaportpcs.net). This led to



ask for a number of improvements, namely: (a) produce the structured output document in a customised format different from just XML; (b) change the data extraction settings to specify the page number where a certain value has to be searched for; (c) generate name of the file processed including time and date in a specific format; (d) read bar codes and add new fonts. All these improvements are suited to be co-developed on the Dematerialisation eService and their implementation is presently ongoing.

2.3 Networking eService

This Networking eService was considered by several partners but eventually exploited by few of them because of a still limited diffusion of formalised SME networks.

Requests from Italy

The requests raised from the Italian partners are listed here below together with indication of the co-developed improvements:

- The three maintenance service consortia (networks) taking part in the Italian pilot requested jointly two main improvements to the Networking eService for specialising it with respect to that specific sector. One request was adding a function for modelling the plants to maintain in terms of their hierarchical composition into parts and sub-parts so as to easily address every communication on possible faults to the specific affected component. Since this improvement was quite heavy to perform and required a deep knowledge of plant structure it was implemented only with an intense participation of all the parties to a really effective co-development activity.
- The second request followed the previous and was intended to enrich the customer calls for intervention by including a reference to the affected plant components. In other words, plant structure modelling could be exploited on the one side when classifying the possible faults per component and on the other side when signalling the occurrence of one of the classified faults. Even this improvement was complex to design and realise and its successful implementation was basically assured by an effective well-coordinated co-development activity.

2.4 Objective CO2 eService

This Objective CO2 eService was not considered in the proposal and added later under request of some partners that decided to exploit it.

Requests from Spain

The requests raised from the Spanish partners are listed here below together with indication of the co-developed improvements:

- In this case the request was not to improve an eService but to create the new Objective CO2 eService. After discovering the Objectif CO2 program launched in France, the Spanish partners presented the initiative at some conferences and workshops involving local carriers. Starting from a recent policy adopted by the Spanish government, targeting carbon footprint, it was decided to develop the Objective CO2 eService for the CO-EFFICIENT project. A lot of interest was expressed several SMEs contacted the Spanish partners, directly and through associations, about getting involved in the program. Once again, the introduction of the eService was the result of a clear co-development initiative involving partners and potential users.



3. Instructions and materials on eServices

The development, improvement and use of eServices called for an intense documentation activity aimed at supporting the eService promotion intermediaries in final users training and pilot execution. At this project stage when most of the requested improvements have been implemented or are in advanced progress it is time to collect the entire produced instructions and materials into one place accessible to all.

This place has been identified as one sector of the CO-EFFICIENT project web site, whose URL is: <http://www.coefficient-project.eu/eservices/eservices>. In this section the documents presently available and stored at that address are simply listed and described to facilitate their search by actual or potential users.

3.1 Transports eService

File name	Contents
Transports-manual-EN.doc	User manual, in English, with the basic instructions to start exploiting the Transports eService. This manual corresponds to the initial and still valid functionality of this eService.
Transports-presentation-ES.pptx	Brief presentation, in Spanish, of the Transports eService given to transport associations and operators at the “Jornada Ahorro Energético en Empresas de Transporte”, Valencia, June 10, 2015.
Transports-pilotCNAferrara-IT.pdf	Presentation, in Italian, of the CNA Ferrara pilot case representing the operational model of the involved transport company and the energy efficiency benefits introduced by the eService.

3.2 Dematerialisation eService

File name	Contents
Dematerialisation-manual-EN.docx	User manual, in English, with the instructions to start exploiting the Dematerialisation eService. This manual corresponds to the initial and still valid functionality of this eService.
Dematerialisation-manual-HR.pdf	Brief user manual, in Croatian, with the basic instructions to start exploiting the Dematerialisation eService. This manual has been used to show the eService to potentially interested companies.
Dematerialisation-webgui-FR	Folder with the translation into the French language of all the terms pertaining to the web user interface. This information has been used to generate the French user interface of this eService.
Dematerialisation-presentation-ES	Brief presentation, in Spanish, of the Dematerialisation eService given to transport associations and operators at the “Jornada Ahorro Energético en Empresas de Transporte”, Valencia, June 10, 2015.



3.3 Networking eService

File name	Contents
Networking-manual-EN.doc	User manual, in English, with the instructions to start exploiting the Networking eService. This is the version directly taken from the eBest European project generating the Networking prototype.
Networking-pilotCedem-IT.pdf	User manual, in Italian, presenting the Networking eService as it has been improved and co-developed together with Cedem (maintenance company) looking forward to the execution of the Italian pilot.
Networking-tutorialPlannerModeling-EN.swf	Video presentation, in English, of the Networking eService function allowing the lead company to model the network distributed processes and the roles played by the member companies.
Networking-tutorialPlannerUsing-EN.swf	Video presentation, in English, of the Networking eService function allowing the lead company to plan the (previously modelled) distributed process that is needed to satisfy the single incoming customer order.
Networking-tutorialSchedulerModeling-EN.swf	Video presentation, in English, of the Networking eService function allowing every supplier company to model its own internal processes to be activated for the performance of assigned tasks.
Networking-tutorialSchedulerUsing-EN.swf	Video presentation, in English, of the Networking eService function allowing every supplier company to launch the scheduler of the internal process that is needed to satisfy the single assigned task.

3.4 Objective CO2 eService

File name	Contents
ObjectifCO2-overview-EN.pdf	Broad presentation, in English, of the action forms suited to SMEs to reduce the CO2 emission in the road freight transport sector, the French original is available in www.objectifco2.fr .
ObjectiveCO2-presentation-ES.pptx	Brief presentation, in Spanish, of the ObjectiveCO2 eService given to transport associations and operators at the "Jornada Ahorro Energético en Empresas de Transporte", Valencia, June 10, 2015.



4. Final remarks

As a matter of fact the co-development of improved and additional functions to the eServices is a never-ending story fed by the Living Lab model itself. In practice, the pilot experiments that are carried out in the frame of the Living Labs are still proposing changes and improvements even after the formal conclusion of the co-development stage. Then, taking into account the evident benefits of continuous improvement, it was decided to spend the last resources to embrace as far as possible those requests and make the Living Labs show their power and enhancement potential.

For these reasons in the last project months it is expected that there will be further involvements of user companies in pilots, further co-developments of eServices, further production of instructions and materials. Not all this effort will be documented in the official project outputs but it will remain available in the improved eServices and naturally in the public sections of the project web site.