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7th FP topic addressed:
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Small or medium scale focused research project (STREP)

D2.7 Project Fact Sheet

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Abstract	:	The document gathers a short project synopsis for publication on the FP7 Project Portfolio page: http://cordis.europa.eu/fp7/ict/content-knowledge/projects_en.html), and it is structured based on a template supplied by the EC.

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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http://www.advance-logistics.eu

<Headline>

Enabling strategic planning coupled with instant decision making to provide vision in a blizzard of data

<Abstract>

Logistics networks accumulate OVER 1 BILLION new items of information per month (customer orders, pallet-vehicle movement, GPS data, postcodes, depot data, etc.), generated every minute of each day by thousands of pallets travelling on hundreds of trailers for more than one million customers under hundreds of thousands of postcodes, each with multiple different service requirements. Patterns and dependencies in 50 million or more data elements can only be analysed by intelligent data-mining approaches linked to strategic decision making based on longer term analyses of billions of pieces of information.

ADVANCE will develop an innovative predictive-analysis-based decision support platform for novel competitive strategies in logistics operations. It will provide a dual perspective on transport requirements and decision making dependent on the latest snapshot information and the best higher-level intelligence. Our software framework will be available open-source, as this way, low initial investment will encourage also smaller enterprises to exploit the solution. Also, previously unidentified needs will receive better coverage as development can proceed in close collaboration with the users.

<Project description> <Image>

Why is improvement needed?

Networked companies suffer from inefficient utilisation of resources (e.g. deadheading traffic, excess product spoilage, unbalanced capacities) due to limitations in processing localised information in larger amounts and over larger ranges. These deficiencies can be mitigated if companies

- invest in sharing and collating information over temporal and hierarchical ranges, and
- introduce methods of analyzing the collected data comprehensively enough to cover the sources of network operation deficiencies.

In view of the amount and span of information (both in terms of location as well as dynamically over time) modern artificial intelligence methods can provide a substantial advantage by their abilities to collate and filter the available information, identify phenomena of importance, and provide decision support, forecasts or early warnings for human personnel. This, again, requires:

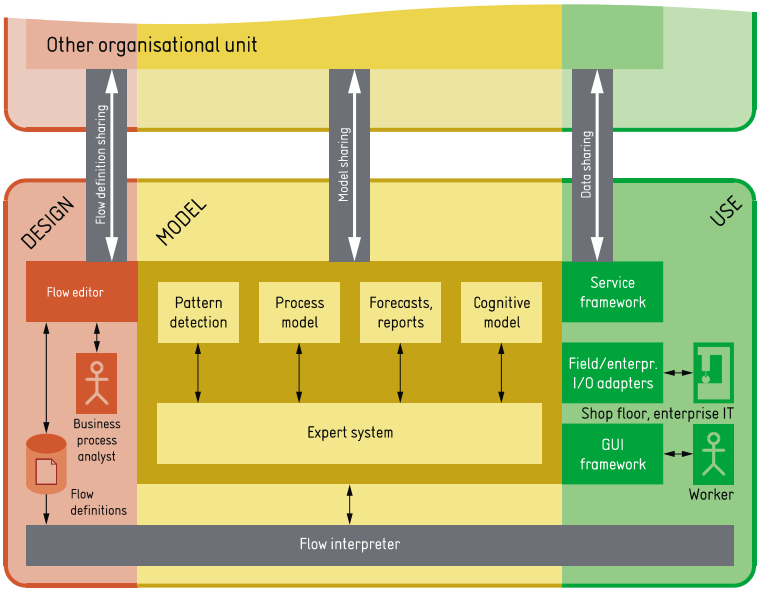
- data to be obtained and processed in machine form so that data mining can be applied;

- methods for automatically identifying relevant information;
- and the intelligence for relating this information to selected decision priorities for the network operation.

In many cases, the acceptance of decision support systems (and therefore, the “return on investment” in data sharing and processing) is leveraged beyond a critical level if the output of automatic processing is in a human-interpretable form (i.e., it “makes sense” with the experienced operator), allowing human assessment of the decision quality.

What solution will ADVANCE deliver in response?

In order to support networked companies in improving their information collecting and processing infrastructure, the project will deliver the open-source ADVANCE platform and comprehensive accompanying reference material, both of which will be directly applicable to the industry.



ADVANCE architecture

The ADVANCE software will have the capacity to analyse massive data sets for long term planning as well as rapidly processing huge amounts of new data in real time. It will provide a **dual perspective** on transport requirements and decision making dependent on the latest snapshot information and the best higher-level intelligence. Summarizing its key functionalities, the ADVANCE platform will:

- allow companies to extend their already existing infrastructure towards better information sharing;
- provide means for exploiting this information for better operating decisions;
- present automatically generated results in a human-interpretable way;
- facilitate the alignment of artificial and human expertise so that they can cross-validate and collaboratively adapt the system as the knowledge domains evolve.

The additional reference material will give insight into the mechanisms of sharing and exploiting information to the benefit of the network by presenting:

- the theoretical background of the ADVANCE solution's underlying processes, and
- a knowledge-engineering based methodology for identifying and representing relevant processes and decision priorities in the decision support system.