



Net-WMS Project Management

The governance of Net-WMS is exercised via a *Scientific Co-ordinator*, a *Technical Manager*, and a *Finance & Administration Coordinator*. Together with the *Work Package Leaders*, they form the project *Steering Committee*, which is the main decision-making body of the project.

For more detailed information on the project, feel free to contact one of the Net-WMS liaisons:

Scientific Coordinator



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Net-WMS Fact Sheet

Net-WMS is a Specific Targeted Research Project co-funded by the European Commission's ICT for Enterprise Networking. It contributes to the Ambient Intelligence (AITPL) European cluster.

EC Project No :	FP6-034691
Instrument:	Specific Targeted Research Project
Start Date:	September 1st, 2006
Duration:	3 years



Project management :	ERCIM
Manufacturing Companies :	Peugeot Citroën Automobiles (PSA), CRF / FIAT Group
Research Institutes :	INRIA, CEA, Swedish Institute of Computer Science
Academics :	Ecole des Mines de Nantes
Technology SMEs :	KLS Optim (France), Mind2Biz (Turkey), WideScope (Portugal)

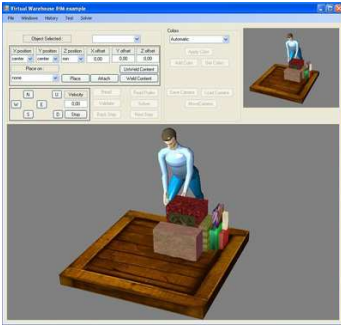
Total Project Cost:	4 476 497 euros
EC Funding:	2 320 000 euros



Further Information : <http://net-wms.ercim.org/>

September 2008





NET WMS

Networked Businesses in WMS



PSA Warehouse

Towards integrating Virtual Reality and optimisation techniques
in a new generation of **Networked** businesses
in
Warehouse Management Systems
under constraints

Project co-funded by the European Commission





Net-WMS Project Summary

The Net-WMS project aims at proposing interactive optimisation tools and prototype software that will form the basis for a new generation of **Warehouse Management Systems** networked services. Net-WMS handles networked communication and co-operation processes through a variety of technologies:



- the integration of decision-making technologies,
- generic 2D/3D and higher-dimensional placement constraint solvers,
- visualisation and interaction with the solvers in virtual reality,
- packing models and knowledge modelling with business rules.

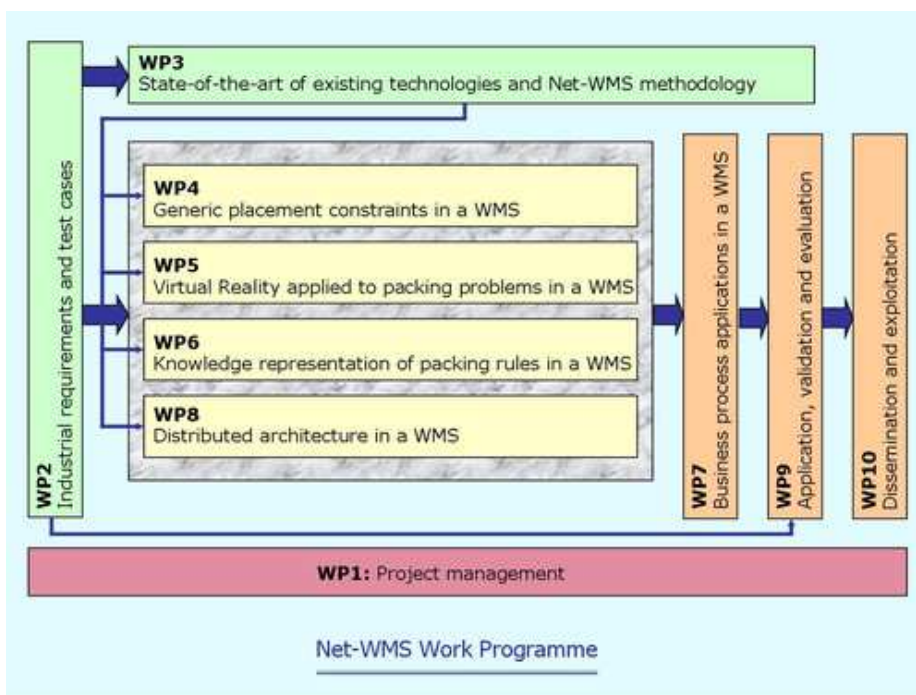


The project scientific outcome is relevant to the whole domain of combinatorial optimisation. It will have direct technological impact on Supply Chain Management at both the WMS and TMS (Transportation Management Software) levels, especially in the areas of packing, vehicle loading, space management, planning & scheduling, inventory control and packed item visualisation.

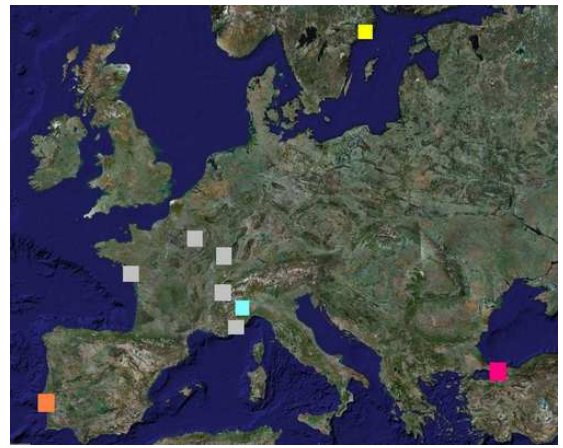
Net-WMS Work Programme

The Net-WMS project is structured around 10 Work Packages (WPs), each led by one of the consortium partners. The different areas of research and development can be logically illustrated as follows:

- WP1: Overall **project management**.
- WP 2,3: **Analysis** - identify WMS best practices, existing technologies and algorithms. Select business cases.
- WP 4,5,6,8: **Research** - Placement constraints and solvers, knowledge modelling, virtual reality, Networked Architecture and prototype application of an integrated networked WMS.
- WP 7,9,10: **Outcome** - Apply prototypes to business cases, evaluate, disseminate and prepare for commercialisation. Integrate generic technologies in Open Source constraint programming software.



Net-WMS Consortium Members



Net-WMS Achievements

From a **scientific** standpoint, significant advances have been achieved concerning:

- The algorithmic treatment of global placement constraints for objects of higher dimensions including space and time [Beldiceanu Carlsson Poder CPAIOR'08],
- The expression of constraint optimisation problems with a modelling language of business rules [Fages Martin CSCLP'08],
- The use of this rule language to parameterize global constraints [Beldiceanu Carlsson Martin CP'08],
- The control of an optimisation tool with interactions in virtual reality,
- Optim Pallet (V1) : software tool developed by KLS OPTIM using Net-WMS technologies to optimise the packing of various products into pallets.

On the **technological** side, the project is paving the way to next generation WMS software by developing innovative technologies that enhance operations in industrial warehouse environments. These include:

- The global constraint Geost for geometrical problems which has been added to the open-source Java-based Constraint Programming system Choco, <http://choco.sourceforge.net>
- The open-source compilers of Rules2CP and PKML (Packing Knowledge Modelling Language) to the constraint programming systems Choco and Sicstus-Prolog, <http://contraintes.inria.fr/Rules2CP>
- A set of J2EE interfaces for interoperability and mobile services, enabling communications between planning components across a network,
- A mobility interface, allowing remote users (e.g. truck drivers) to report planning changes,
- New interactive modules combining Constraint Programming, Rule Programming and Virtual Reality, in support of modelling, simulation and optimisation of the packing process.

In terms of **commercial** impact, Net-WMS aims at improving European competitiveness in the area of warehouse management by significantly reducing costs related to packing, manpower and transportation. To this end, the project is producing innovative tools and plug-ins such as:

- A packing modeller of items based on optimisation techniques and interactions in virtual reality,
- A palletising tool using optimisation techniques,
- A dispatcher including the virtualisation of a truckload.

NET WMS
Networked Businesses in WMS

