

INSTITUTO TECNOLÓGICO DE ARAGÓN



Information Technologies for Collaborative Supply Chains

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Outline

- ❑ Aragon Institute of Technology (ITA)
- ❑ ICT4LOG identified challenges.
- ❑ Supply Chain Collaboration: benefits, difficulties
- ❑ Supply Chain Collaboration: technologies, related projects
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- ❑ Spanish National ICT4LOG Demo Center
- ❑ Contact

Aragon Institute of Technology (ITA)

The Aragon Institute of Technology is a non-profit Technology Center whose main objective is to promote competitiveness in the industrial sector and to support the growth of business sectors by means of the development, acquisition, adaptation, transfer and diffusion of innovative technologies in a multi-agent collaborative framework.



220 people
1000 clients/year
15M€ anual budget
1.7M€ anual investments
15.000m2 Zgz/Walqa





MINISTERIO
DE INDUSTRIA, TURISMO
Y COMERCIO

PLAN
AVANZA

ITA eLogistics (ICT4LOG)

National Knowledge Center (www.ict4log.eu)

- ❑ Generation, adaptation, transfer and diffusion of knowledge
- ❑ Applying ICT to solve logistical problems
- ❑ To develop collaborative and sustainable logistics



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ICT4LOG identified challenges

- ❑ Challenges in eLogistics
 - ❑ Collaboration in the Supply Chain
 - ❑ Co-Modality / Multi-modality
 - ❑ Sustainable Urban Logistics
 - ❑ Humanitarian Supply Chain and action in emergency and natural disaster



Foto: UNICEF/HQ05-0041/Jeremy Horner



Supply Chain Collaboration: benefits and difficulties

- ❑ Collaboration is a process of participation through which people, groups and organizations work together to achieve desired results.
- ❑ Supply Chain Collaboration: the common goal is to create a transparent, visible demand pattern that paces the entire supply chain. (Holweg et al.)

Planning Collaboration	Yes	Type 1 Information Exchange	Type 3 Synchronized Supply
	No	Type 0 Traditional Supply Chain	Type 2 Vendor Managed Replenishment
		No	Yes
Inventory Collaboration			

“Supply Chain Collaboration: Making Sense of the Strategy Continuum”, Holweg, M., Disney, S., Holmström, J., Smaros, J. Center for Technology, Policy and Industrial Development, Massachusetts Institute of Technology and Judge Institute of Management; University of Cambridge, Logistics Systems Dynamics Group, Cardiff Business School, Cardiff University; and Logistics Research Group, BIT Research Centre, Helsinki University of Technology



Supply Chain Collaboration: benefits and difficulties

❑ Benefits achieved through Collaboration

- ❑ Better customer service levels.
- ❑ Reduction in inventory levels.
- ❑ Elimination of bullwhip effect: linking inventory and replenishment decisions.
- ❑ Better utilization of transportation resources: load factors, routing, traffic info. Improved sustainability.
- ❑ Controlling risk for constrained components.

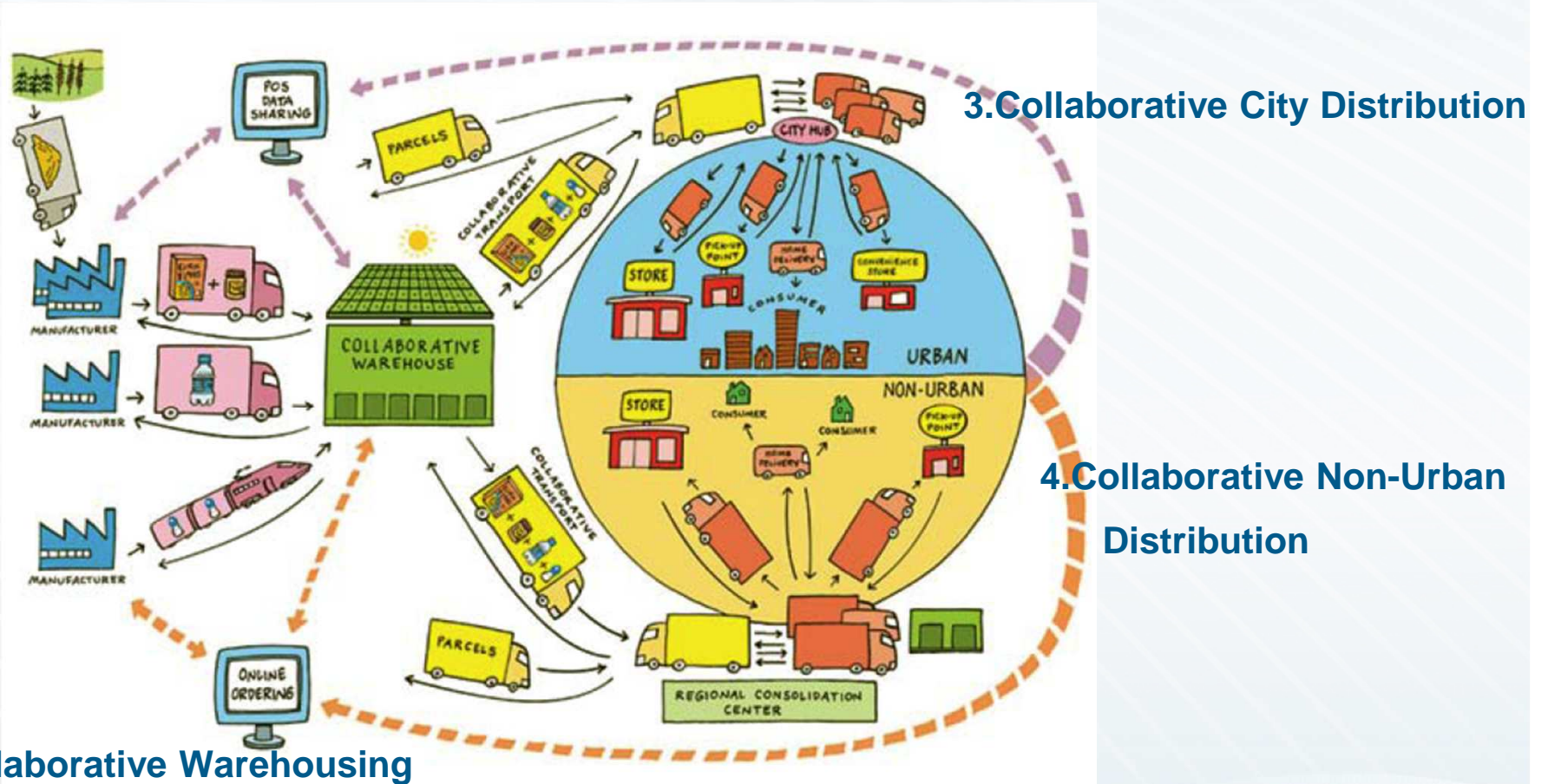
❑ Difficulties in Collaboration

- ❑ Companies are reluctant to share information
- ❑ Security when sharing the information
- ❑ ICT integration in the supply chain needed



Supply Chain Collaboration: benefits and difficulties

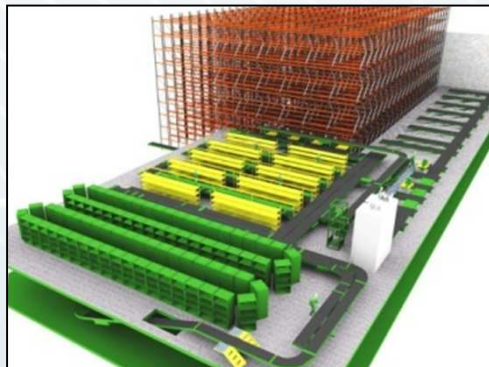
“2016: Future Supply Chain”, Global Commercial Initiative (GCI) and Capgemini (2008).



1. Information Sharing: driving the collaborative supply chain

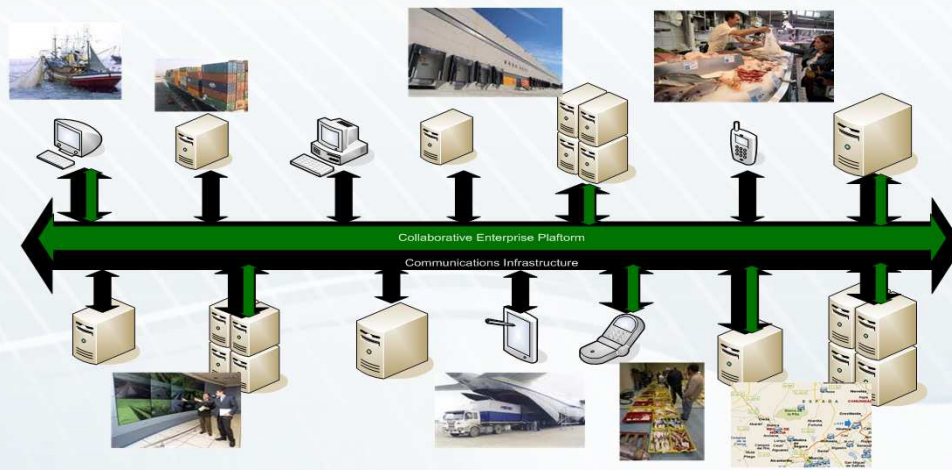
Supply Chain Collaboration: technologies

- ❑ Modelling, simulation, forecasting
- ❑ RFID (readers, lables, printers, doors), scanners, bar codes, 2-D codes, imageID: pallet and box identification, order preparation, delivery/pick up check
- ❑ LSN – Logistic Sensors Networks. Communicated warehouses. Wifi, Zig-bee.
- ❑ Transportation: GPS and Galileo, GPRS and 3G.
- ❑ Urban and long distance freight transport. Real time scheduling for transport and warehouses.
- ❑ Adaptative Warehouse management systems WMS. ERP integration.



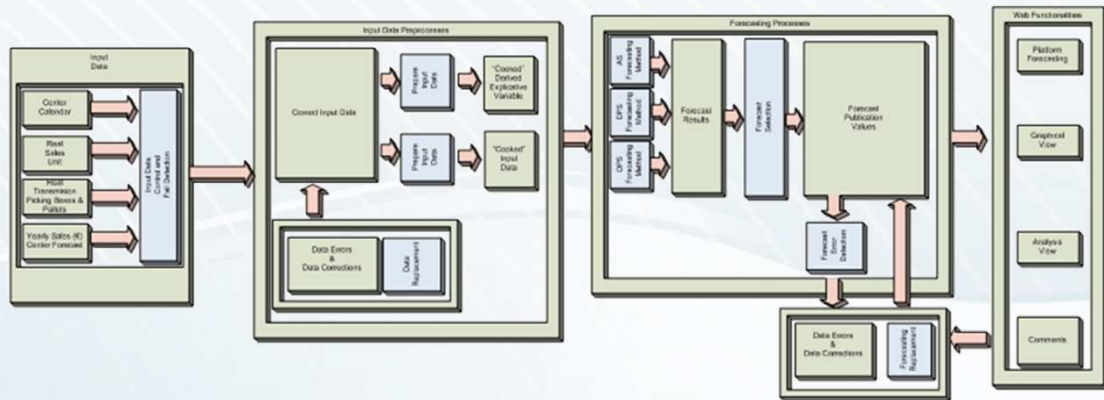
Supply Chain Collaboration: technologies

- ❑ IT Platforms, IT Security
- ❑ Next technologies in the IoT: miniaturization of sensors and low power communications infrastructures.
- ❑ Next middleware generation: FI PPP (FIWARE) and transport and logistics FINEST, INSTANT MOBILITY. SW Infrastructures to publish, discover, execute, and dynamically compose Context dependent services.
Collaborative DDSS



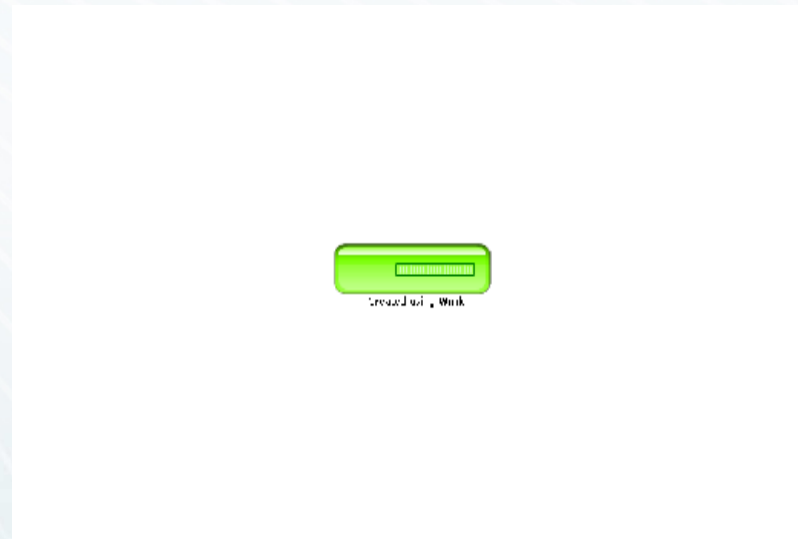
Supply Chain Collaboration: related projects

- ❑ Demand Forecasting Carrefour Spain

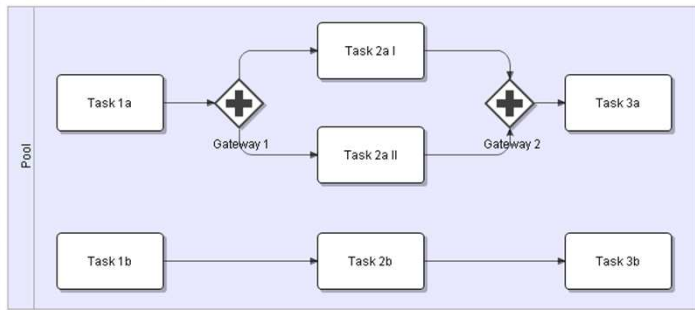


Supply Chain Collaboration: related projects

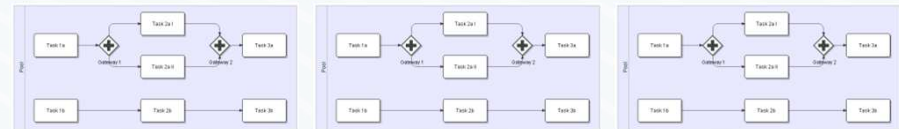
- ❑ The Digital Business Ecosystem (DBE) is an FP6 Internet-based software environment in which business applications can be developed and used.
- ❑ It is a P2P OS middleware which allows easy and fast service delivery, discovery, composition and execution.



Supply Chain Collaboration: related projects



Modelled Logistics Processes (BPMN) with SOA execution capacities



Company 1

Company 2

Company N

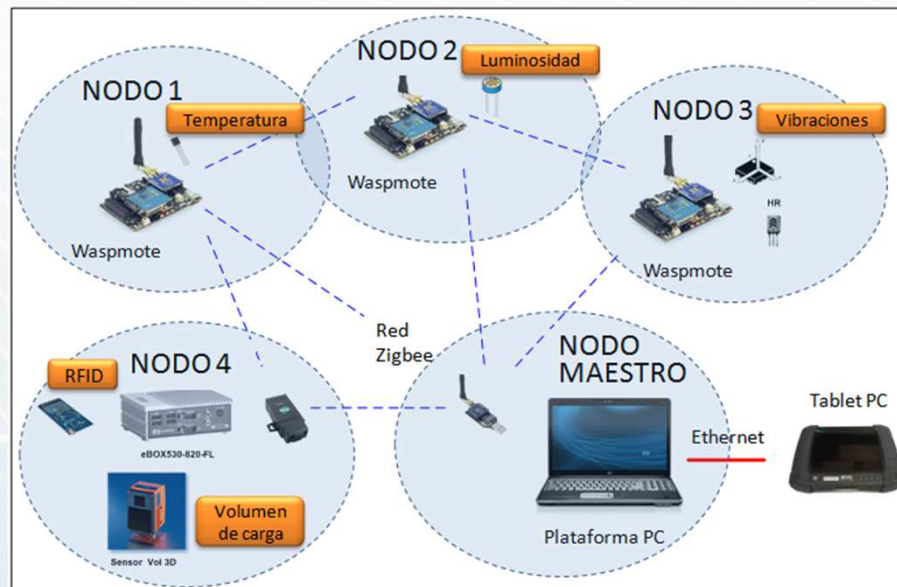


Services Integration in "Enterprise Service Bus"



Supply Chain Collaboration: related projects

- ❑ **AIMTRAFFIC:** Using info provided by a urban fleet to make traffic calculations and forecastings in real time in urban areas.
- ❑ **SIT:** Capturing info from Zigbee WSN in freight trucks and makes data available to the complete Supply Chain for different services.



INSTITUTO TECNOLÓGICO DE ARAGÓN

AIMTRAFFIC: Advanced Interface System for Fleet and Traffic Forecast Aimed to the Taxi Market

The logo for ita (Instituto Tecnológico de Aragón) features a stylized blue square icon with a white grid pattern, followed by the lowercase letters 'ita' in a bold, blue, sans-serif font.

Supply Chain Collaboration: conclusions

- ❑ Collaboration improves performance of supply chains (potential reductions of >30% transport cost/pallet, >20% handling cost/pallet, 40% reduce lead time and lower >25% CO2 emissions/pallet, improved on shelf availability)
- ❑ Difficulties of collaboration relies on culture, security and lacks of integrated technology.
- ❑ Some Spanish and European projects has been presented in order to show how ICT technologies can help improve collaboration.
- ❑ Many steps ahead are necessary to reach synchronised supply chains but ...

... ICT technologies will be one of the main enablers.

The National ICT4LOG Demo Center

National Demonstrator Centre of ICT for Logistics

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DEMOSTRADOR**  **TIC | LOGÍSTICA**

UNIÓN EUROPEA



FEDER

"Construyendo Europa desde Aragón"



Economía
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