
The Role of New Technology for Logistics Operations

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Current Situation (not only) in Logistics

- Companies request:
 - Individual logistics services
 - Fulfillment of flexible and extensive turn-key 3PL services
 - Support for tailor-made processes and value-added services
 - Transparency of costs and performance

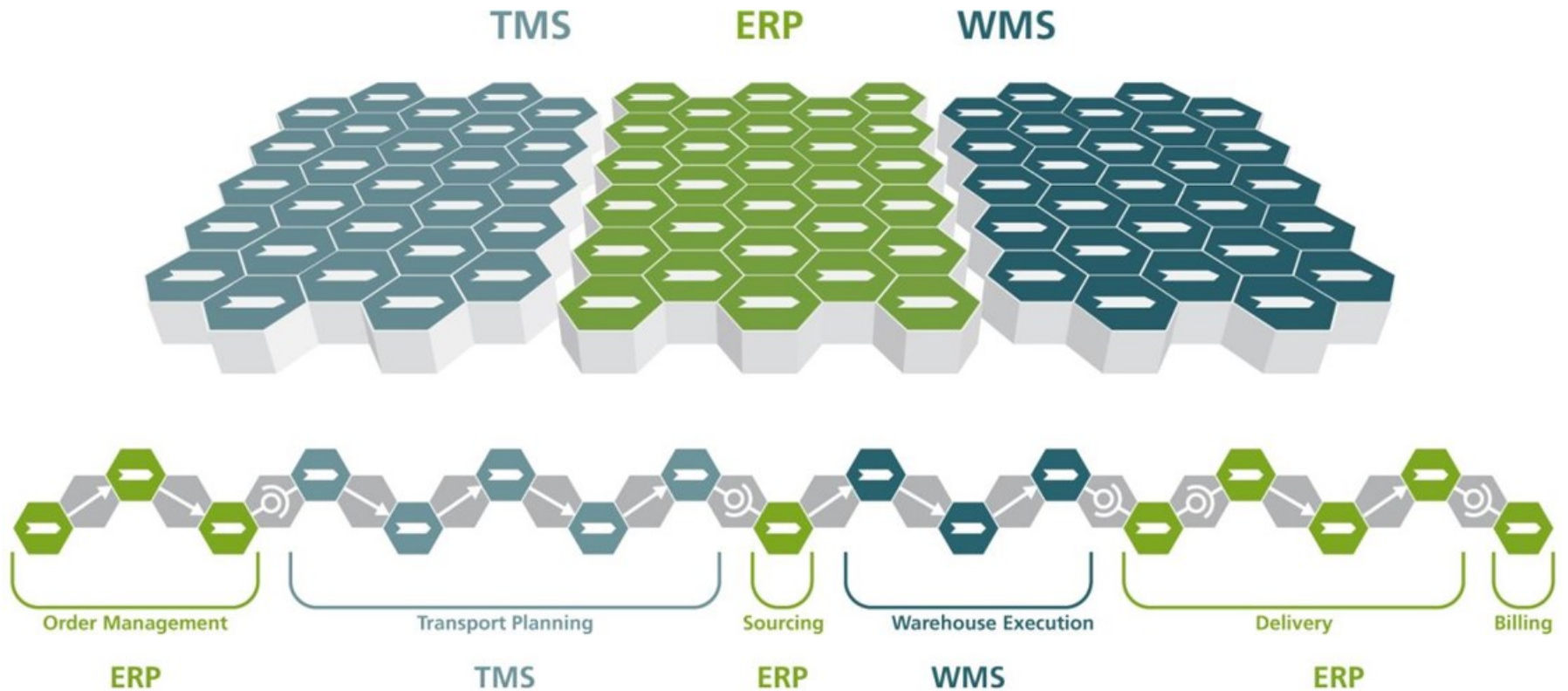
- What companies don't want
 - Long contract periods
 - High basic investments

Those Requirements are true for both...



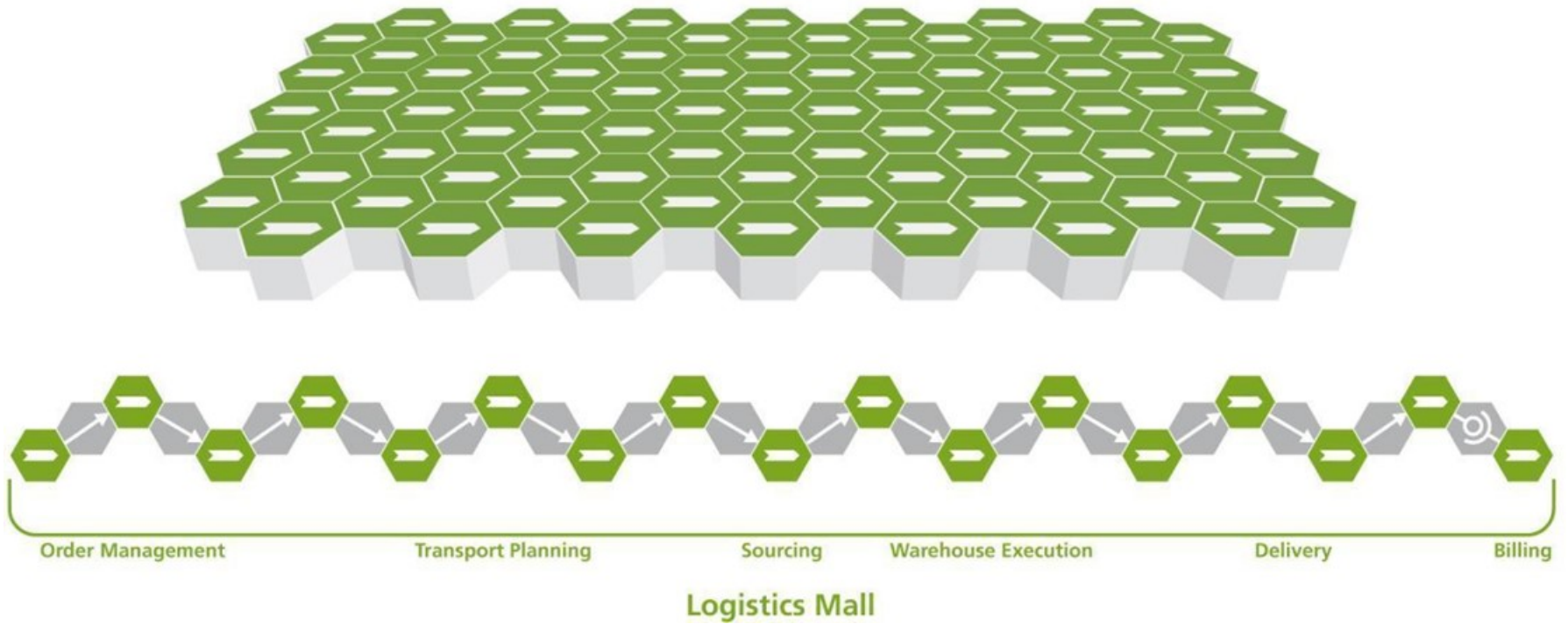
IT-Architecture: TODAY

Monolithic Software Blocks



IT-Architecture: TOMORROW

Internet of Services



Logistics Mall – Cloud Computing for Logistics



- Virtual marketplace for logistics and IT apps
- The way from application-centric processes (like MES, WMS and ERP) to service-oriented processes

Fields of Innovation

■ Logistics-by-Design (Standards)

Standardized structures called business objects for the definition and modeling of logistics services and objects

→ Allowing easy integration of business processes and services

■ Logistics-on-Demand (Tools)

Cloud-based tools for the integration and development of logistics services

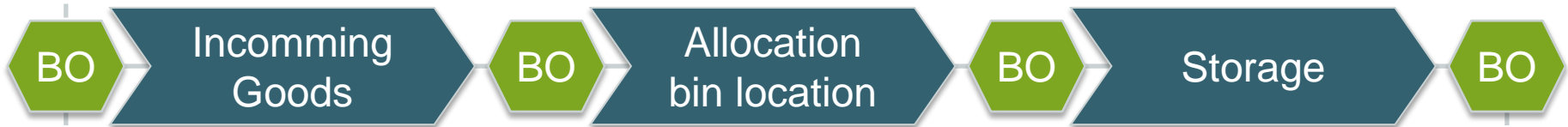
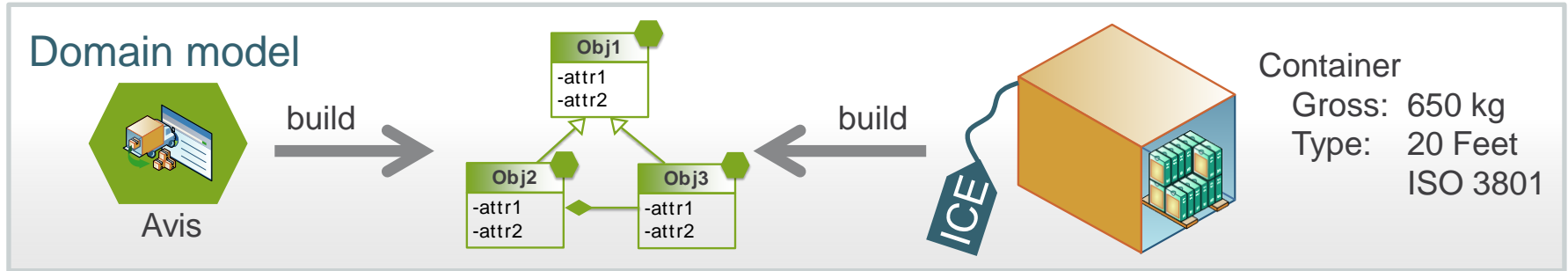
→ Support for the creation of flexible business processes

■ Logistics-as-a-Product (Marketplace)

Virtual marketplace for custom-made logistics processes ranging from single services to complete software solutions

→ Logistics processes as tradable goods

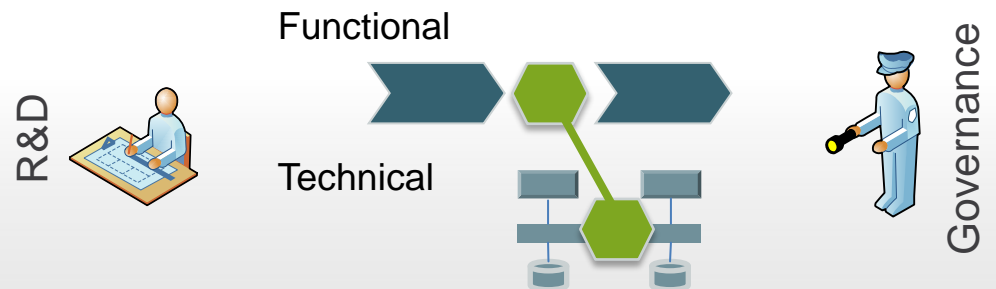
Internet of Services - Business Objects



Business Objects

- Standardized
- Independent from technologies
- Interfaces enabling compatibility for apps

Logistics & IT

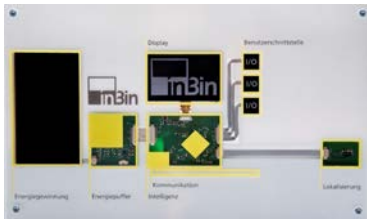


Those Requirements are true for both...



Intelligent Objects - Timeline

2009



Intelligent Bin

2012



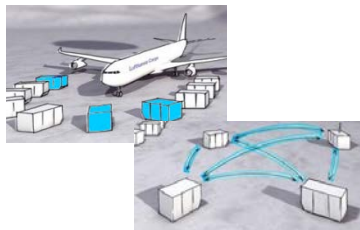
WÜRTH iBin

2014



HMI -
COASTER

2011



DyCoNet

2013



HMI - Debrunner
intelligent Display

Smart Transport Items



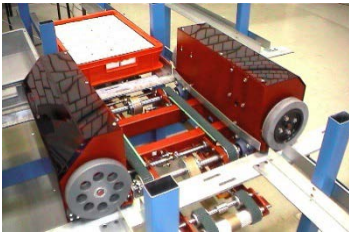
- Examples for smart load carrier / smart transport items
 - Inbin, the intelligent bin (Fraunhofer)
 - Saves and communicates information about goods
 - Organizes and controls the material flow
 - IBin, storage solution (Würth)
 - C-part management based on image recognition
 - Kanban: automatic reordering when bin gets empty



Reference: Würth Industrie Service GmbH & Co. KG

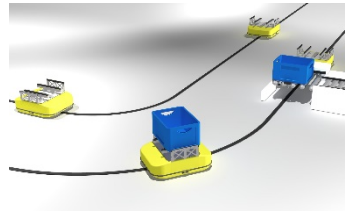
Transport Systems Innovations - Timeline

2009



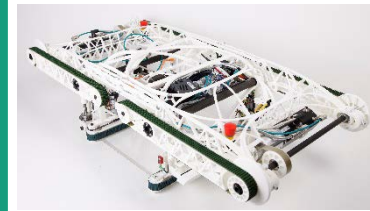
Multishuttle

2012



LOCATIVE

2014



RackRacer

2011



Multishuttle Move

2013



serva
transportsystems

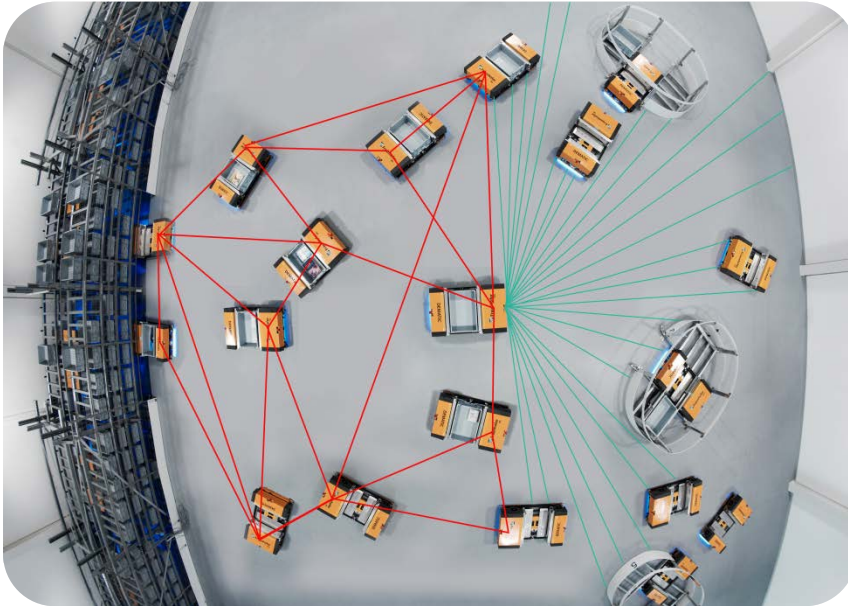
Cellular Transport Systems



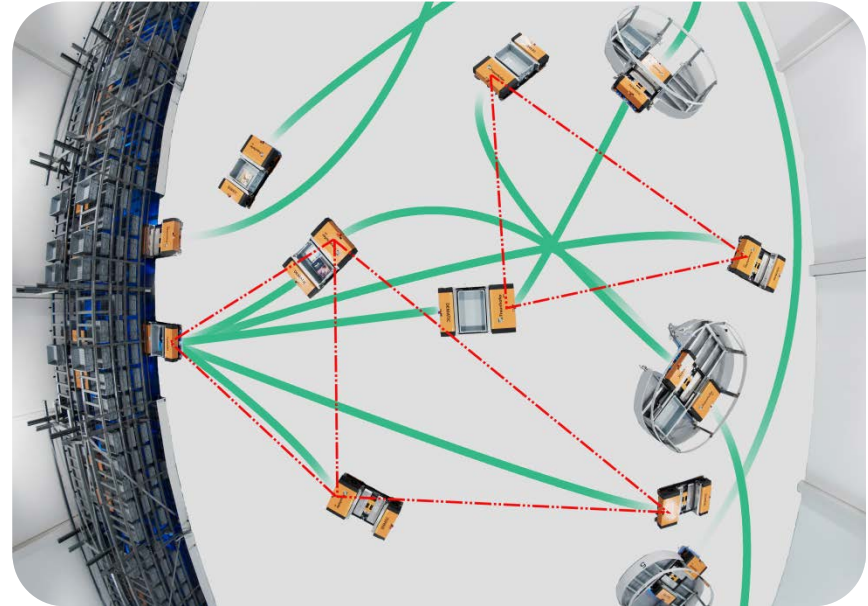
- Combination of smart transport items and cellular transport systems
 - Flexible flow of goods
 - Routes
 - Throughput
 - Ad-hoc adaption to changing environments
 - (Static) infrastructure-reduced logistics
- Cooperation of men and machine

Cellular Transport Systems

Swarm Intelligence



- Exchanging of sensor information in a mesh network
- Autonomous behaviour detects relevant changes in the environment



- Coordinated, free path planning to reduce waiting time and to guarantee the achievement of transports
- Consideration of mission/transport priorities and vehicle properties

Industrie 4.0: Developments towards Smart Factory

Intelligent Transport Items



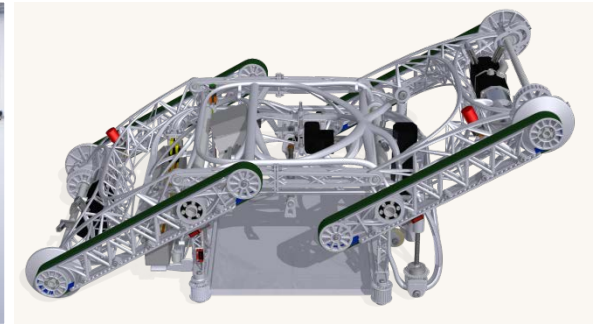
- Sensor intelligence
- Communicating
- Energy harvesting

Cellular Transport Systems

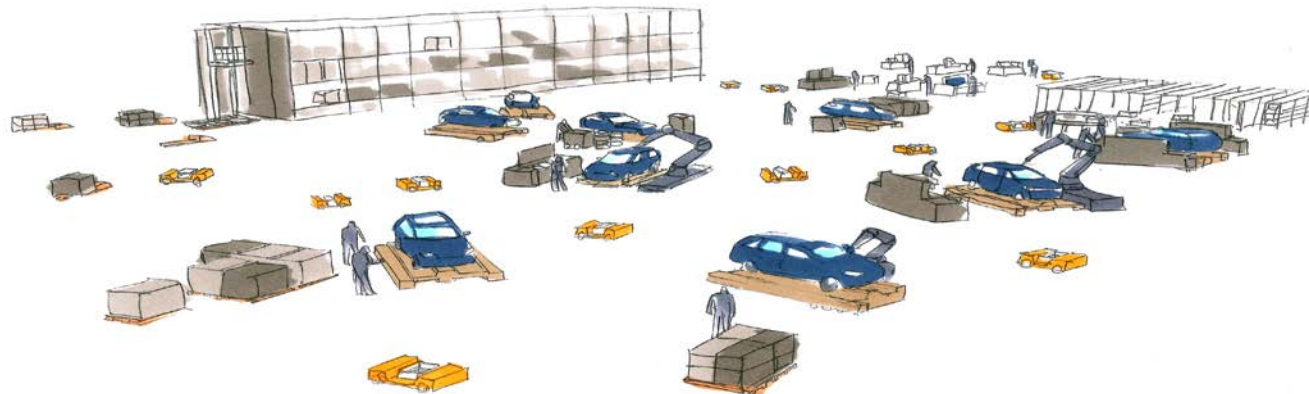


- Autonomous driving
- Self-controlled behaviour
- Swarm intelligence

Rack Racer



- Autonomous vehicle
- Diagonal movements in the shelf
- Bionic shape



New ICT and Equipment Technology will enable Logistics Systems which are:



- Scalable (in costs and throughput)
- Flexible (in tasks and usage)
- Adaptable (to changing environments and requirements)
- Ad-hoc useable (without long ramp-up or development times)
- Affordable (even for small enterprises)

THANK YOU FOR YOUR ATTENTION

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