A service-oriented platform to achieve collaboration in the supply chain

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Agenda

1. Introduction
2. Technical solution
3. Validation
4. Conclusions

(Paper word cloud)
INTRODUCTION

Questions with companies about collaboration.

Which are the benefits of collaboration?

How can I improve the visibility in the supply chain?

How can I evaluate the impact of a new technology in my process?
INTRODUCTION

- One of the key factors in supply chain management is coordination
- Usually supply chain managers have poor visibility
- Decision problems get complex
- Cost barrier for new members
- Critical for food supply chain

Real coordination needs:
- Integration of information flow
- Real collaborative framework
INTRODUCTION

• Food supply chains require **high flexibility**: availability
• Food supply chains require **agility**: perishability

• Main challenges:
  – Logistics Planning
  – Traceability

“transparency in the food supply chain is essential to guarantee food quality. “

• Key enablers of transparency
  – Information exchange,
  – Regulatory framework
  – Food quality and safety standards
**TECHNICAL SOLUTION**

**ITChain project** aims at creating an infrastructure for catalog, publish, discover, perform and compose *services* dynamically mobility and context-dependent, to facilitate interoperability of existing systems in the supply chain.

![Diagram of ITChain project](image)

Services Integration in “Enterprise Service Bus”
Collaboration objectives

Collaborative planning
  Advanced response
Coordination to incidents
  Improved real time decision-making
Event monitoring:
  Learning from experiences
TECHNICAL SOLUTION

What is SOA:
• **Service-oriented architecture (SOA)**
• **Service**: is a self-contained unit of functionality
  – i.e.: services for temperature, stock, position

Why SOA:
• **SOA makes it easy** for devices to cooperate
• SOA can facilitate the integration with different platforms
• Includes other ideas: Service bus, Service composition…

Use of SOA:
• Accounting, finance, SCM, marketing.
• SOA in supply chain: **Agility and Flexibility**.
TECHNOLOGICAL SOLUTION

ItChain: Group of services

- Collaborative purchasing
- Quality control
- Traceability
- Transportation management
- Collaborative supply
- Resources planning
- Marketing
TECHNOLOGICAL SOLUTION

Platform design

• A service-oriented infrastructure to achieve interoperability for the domain of the value chain is proposed
  – **ESB Services**: Supports the exchange of information.
  – **Mobility**: Access and deployment of services in mobile devices.
  – **Decision Support**: Services in order to assist decision-making.
  – **Connectors**: Interaction with other systems.

Message interchange is addressed through **GS1 standards**
Pilot validation 1 – Food retailer

- Auction centers of La Coruña and Irun
- National network for distribution.
- Information shared (examples)
  - Lots of fish bought
  - Quality of fish
  - Pending quantities to buy
- Scenarios:
  - Collaborative planning
  - Collaborative fish purchasing
  - Collaborative traceability
Pilot validation 2 – Transport company

National transport operator

• Planning:
  – Freight planning (number of trucks)
  – Order preparation

• Execution:
  – Transport and freight delivery information
  – Stock updating

• Load monitoring:
  – Geolocation
  – Sensors (temperature, image)
Pilot validation 3 – Fish company

Fresh fish from national providers and importers

• Planning:
  – Collaborative demand forecast
  – Collaboration with transport agencies

• Execution
  – Coordination among agents
  – Stock sharing service
  – Traceability
  – Administrative processes
Simulation validation

- Supply chain simulation model
  - Increase the number of agents
  - Test in extreme conditions
  - Compressed time (200 days)
Simulation validation

Decision making alternatives
- Full inventory visibility
- Demand driven distribution
- Dynamic supplier selection

Simulation results
- Using ITChain platform:
  - Costs reduction up to 20%.
    - Transportation cost,
    - Inventory holding cost,
    - Order cost
    - Backorders penalty cost
  - Average inventory is reduced around 15%.
Conclusions

Benefits Collaboration
• Decision making
  • Planning
  • Coordination
  • Learning and understanding
• Inventory and cost reduction.

Visibility
• SOA applications
• Mobility technologies

Impact of a new technology
• Collaboration needs trust
• Prototypes and simulation improve trust generation
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