Dynamically Adaptive FI-Applications: Beyond Adaptive Services

Scenario: Transport & Logistics (T&L)

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Motivation

• Economic impact of Transport & Logistics in the European Union
  • 7% of the GDP
  • 5% of total employment

• Ecological impact of T&L*
  • ~15% of the global gas emissions are caused by transportation
  • Transport-caused emissions
    • Increased 50% in 2010 (compared with levels from 1990)
    • Expected to double again by 2030

* Source: World Resource Institute, 2010
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Modern T&L

• Highly distributed inter-business activities

Current problems

- Closed logistic supply chains
- Limited support for agile inter-organizational information exchange and collaboration
- High fragmentation of ICT technologies used by different stakeholders
- Highly manual process associated with legal and governamental regulations
Modern T&L

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**Requirements for FI Applications in T&L**

- **R1** - Efficient support for inter-organizational collaboration in cooperative business networks (operation in agile and dynamic environment)
- **R2** - Seamless integration of information and data along with real-world data acquisition and integration
T&L Processes

- Use Case: Construction of Offshore Wind Energy Plant
T&L Processes

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![Map showing locations of component production by different suppliers](image-url)
T&L Processes

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Individual components produced by different suppliers

OEM or system integrator receives the components
T&L Processes

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OEM or system integrator receives the components

OEM does trial assembly for full operational test
T&L Processes

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1. Individual components produced by different suppliers
2. OEM or system integrator receives the components
3. OEM does trial assembly for full operational test
4. Plant is disassembled and transported to final destination
T&L Processes

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What are the current problems?

- Individual components produced by different suppliers
- OEM or system integrator receives the components
- OEM does trial assembly for full operational test
- Plant is disassembled and transported to final destination
Use Case: Construction of Offshore Wind Energy Plant

T&L Processes

No end-to-end visibility during transport process

Eventual damages to the parts of the wind engine will be discover during trial assembly

Associated problems:
- delay on assembly
- warehousing
Future Internet T&L Applications

- Use Case: Construction of Offshore Wind Energy Plant

Areas of Future Internet Platform

- Ubiquitous Broadband Connectivity
- Real World Integration
- Information Integration & Processing
- Service Provisioning & Consumption

NoF, IoT, IoC, IoS
Future Internet T&L Applications

• Use Case: Construction of Offshore Wind Energy Plant

Areas of Future Internet Platform

- Ubiquitous Broadband Connectivity
- Real World Integration
- Information Integration & Processing
- Service Provisioning & Consumption

- Facilitate access to information across organizational boundaries
- Comprehensive monitoring
- Real-time information
- Ubiquitous access to information
Future Internet T&L Applications

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Adaptation Challenges

- Who is responsible for taking a decision?
- How to re-organize the inter-organizational dependencies?
- How to avoid a chain of effects derived from the reported problem?
THANK YOU!

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