



Cloud Computing in Logistics

– Project LOGICAL: Basics, Use Cases, Achievements –

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Agenda



- ▶ Project LOGICAL – Overview
- ▶ Cloud Computing in Logistics - Overview
- ▶ State of R&D: CC in Logistics
- ▶ LOGICAL-Cloud
 - Cloud Use Cases
 - Far Perspective
 - LOGICAL Cloud Architecture
- ▶ Special Features



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CE-project LOGICAL

Profile, General Features



LOGICAL

transnational logistics improvement through cloud computing and innovative cooperative business models

Transnational **LOG**istics' Improvement through **C**loud computing and innov**A**tive cooperative business model**S**

Duration: May 2011 - October 2014

Budget: 2.9 mio €
(from which 2.4 mio. € ERDF)

Partnership: 13 partners from 6 regions

Objectives: Enhance interoperability
Promote multimodal transports
Decrease costs, improve efficiency & effectiveness
Implement cloud computing platforms, test & interconnect
Special focus: support of SMEs



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Partners – see www.project-logical.eu



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Leipzig (DE) – LP , PP 2, 3, 16

Aufbauwerk-Leipzig (Lead), Leipzig-Halle Logistics Cluster, Leipzig/Halle Airport, University of Leipzig

Wrocław (PL) – PP 4, 6

University of Economics Wrocław, CL Consulting & Logistics Ltd., (PKP Cargo SA)

Usti (CZ) – PP 13

Regional Dev. Agency Usti, (CD Duss terminal Lovosice)

Miscolc (HU) – PP 8, 9

Bay Zoltan Nonprofit Ltd. For Applied Research

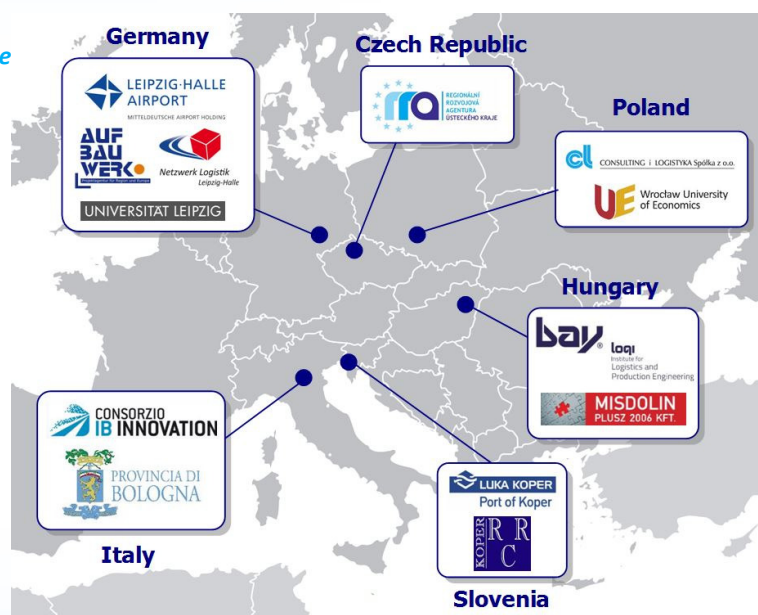
Misdolin Plusz

Koper (SL) – PP 14, 15

Luka Koper, Reg. Dev. Centre Koper

Bologna (IT) – PP 11, 12

Province of Bologna, Consorzio IB Innovation



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Cloud Computing ...

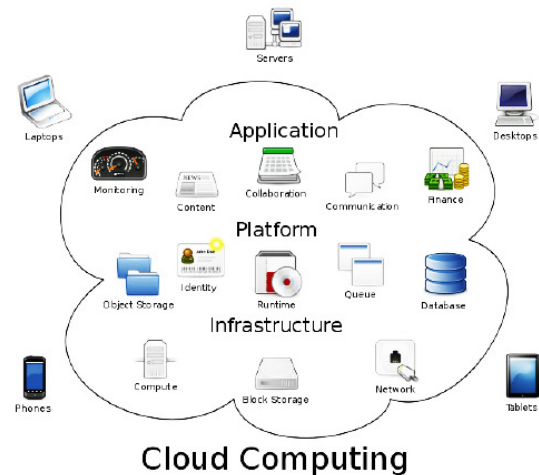


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Cloud Computing features (simplified):

- ❖ storage & processing of data in the “Internet” (IT outsourcing)
- ❖ unlimited scalability of IT resources
- ❖ site and equipment independent access to IT-resources and data
- ❖ Usage on demand (XaaS)
- ❖ pay-per-use tariff
- ❖ suitable for data and BP-integration



Migration: User requirements

- ❖ incrementally, reversibly, KISS
- ❖ above all: security/privacy/compliance... !!!
- ❖ portability of cloud apps to different cloud platforms
- ❖ migration as a service included (MaaS)

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... in Logistics



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Incentive: Interest in „cheap“ & easy access to / outsourcing of:

- ❖ **Advanced Business IT-services, e.g.**
 - Financial accounting, Business-Planning, Controlling
 - ERP/ERM / CRM / SRM / PRM
 - E-Procurement, E-Commerce
- ❖ **Advanced Logistics IT-services, e.g.**
 - Route planning & -optimization
 - Tracking & Tracing, Fleet-Management
 - Freight-Management, Order-Management
 - Warehouse-Management, Supply-Chain-Management

Enforcement: market pressure / competitiveness / customer expectation of:

- ❖ **Service Economics → Faster, Cheaper, Better...**
- ❖ **Customization, push to pull processes**
- ❖ **Demand for Improved Interoperability!**

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Status-Quo: IT in Logistics

- User Surveys 2010-12, Focus: **SME** -



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➤ **Software suitability**

- Limited availability of professional logistics software (prevalent: MS Office)
- >50% utilize at least 2 software products with redundancies
→ partially multiple data storage → **data inconsistency**

➤ **Interface problems**

- **55 %** of all **interfaces malfunctioning** or require manual input
- **extra cost/time/errors!!!**
- inhibitor of introducing SLA-standards



➤ **significant Interoperability / Integration barriers**

➤ **low IT-budgets, rising IT-cost**

➤ **Exponential growth of data and interfaces & related problems**

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R&D in CC for Logistics



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❖ **Actual DHL logistics trend radar:**

- → CC and supergrid logistics: highest mid-term impact perspective

❖ **Actual CC R&D-Projects in EU**

- Project Future Business Clouds (FBC): → 60 R&D projects on CC (Log: 5%)

❖ **EU-R&D projects on ITC in transport and logistics**

- Focus: interoperability and standardization
- Summary in „*One Common Framework for ICS in Transport & Logistics*“
→ **single-window/document** → **common ontology** (if not fitting, „connectors“)

❖ **Market-oriented approaches:**

- e.g. online freight auction platforms (e.g. CODE24)

❖ **Most prominent project: „Dortmund Logistics Mall“ (IML, ISST)**

- **virtual mall** of logistics IT (IaaS, SaaS + ASP), Long term perspective: → „**business objects**“ **BO** (common ontology) + „**logistics process designer**“

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LOGICAL-Cloud Use Cases

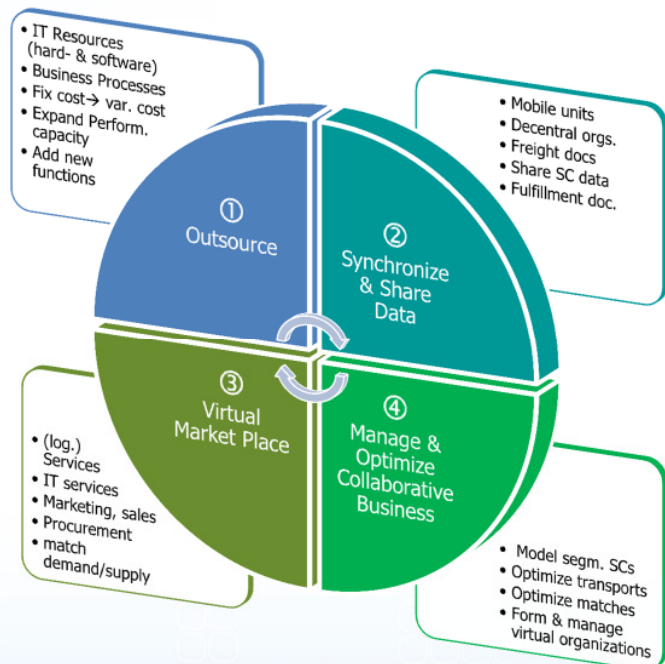


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System of functions & use case categories:

1. IT-Outsourcing on demand
2. Integration Workspace for Sync & Share of data → Secure Interoperability
3. Virtual mall of services & service demands
4. Management Platform for Collaborative Processes



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Far Perspective



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preceding processes



CC-Platform for control & optimization of multimod, fragmented process chains

consequent processes



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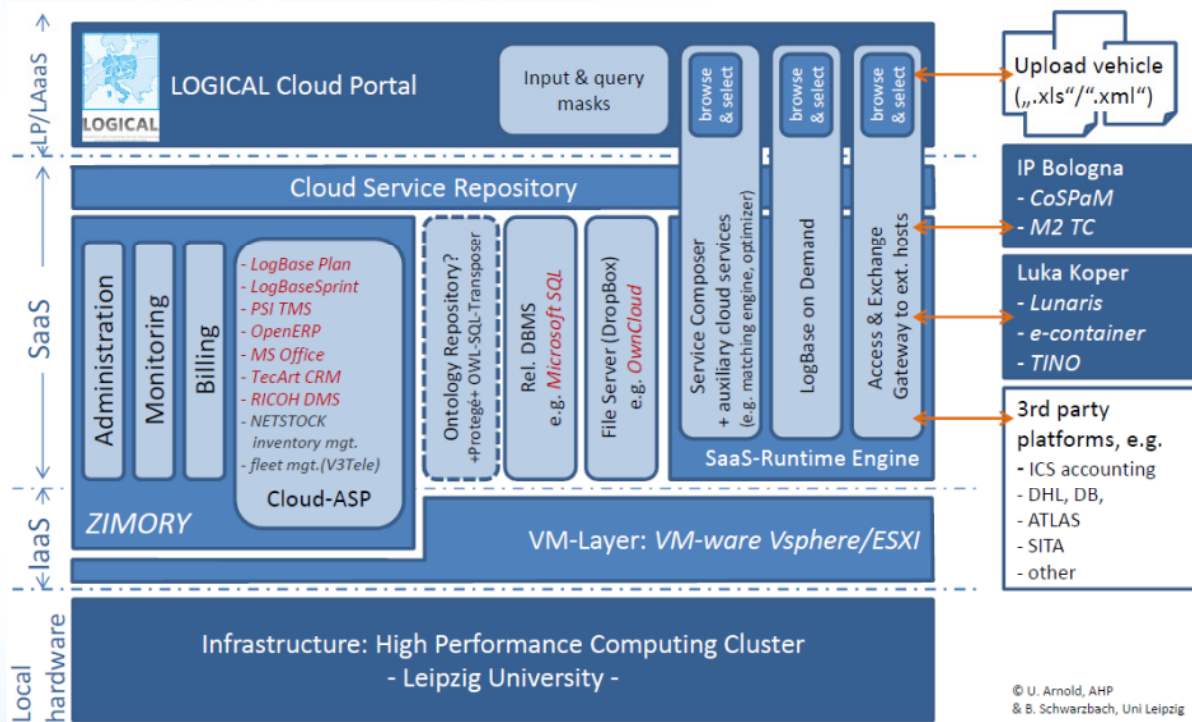
LOGICAL-architecture

technical view, Leipzig version 1.3



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LOGICAL-Cloud

specific feature: semi-automatic „Interfacing“



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- 1st approach: standardization, uniform ontology based, semantic modelling
→ too slow, reluctance of practitioners to participate and modify
- 2nd approach: on-demand connector-creation, recording of applicant's correlation moves, afterwards pattern recognition & application of recorded transformation procedures
→ user-oriented, „learning“ system, incremental collection of „connectors“
- specific use case: Processing of **AirWaybills (AWB's)** at Leipzig/Halle Airport (sub-set: non-digital, non-standard)
- daily exercise: **manul input** of AWB's by employees...
- **time consuming, error producing, expensive, ...**
- solution: Cloud-Service for **document-digitization + semi-automatic data extraction/converting in LOGICAL-DBMS**
- export to standard formats by preconfigured services



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LOGICAL-Cloud

specific feature: semi-automatic „Interfacing“



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- Which documents are convertible? → ALL, which have been processed once manually with recording the converting scheme...



615 LAX 69232505		615-69232505	
Shipper's Name and Address GLOBAL IMPORT AND EXPORT COMMODITY FORWARDERS (LAX) 11101 S LA CIENEGA BLVD LOS ANGELES CA 90045		Shipper's Account Number Not Negotiable AirWayBill Issued by DHL CARGO 236 WENDELL H. FORD BOULEVARD ERLANGER KY 41018	
Consignee's Name and Address INTERFRUIT GmbH - LEI C/O DHL AUF DER MUGGENBURG 7 BREMEN GERMANY 28217		Consignee's Account Number It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. ALL GOODS MAY BE CARRIED BY ANY OTHER MEANS INCLUDING ROAD OR ANY OTHER CARRIER UNLESS SPECIFIC CONTRARY INSTRUCTIONS ARE GIVEN HEREOF BY THE SHIPPER, AND SHIPPER AGREES THAT THE SHIPMENT MAY BE CARRIED VIA INTERMEDIATE STOPPING PLACES WHICH THE CARRIER DEEMS APPROPRIATE. THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIER'S LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher for carriage and paying a supplemental charge if required.	
COMMODITY FORWARDERS, INC TEL# 1-310-348-8855 LOS ANGELES		Accounting Information ORDER NUMBER: IP-231 CFI: LAX-493899 PO#: 11794040 M. DOLITSCH AES ITN: X20121214056639	
Agent's WTA Code 01-1-1071/0016		Account No. IP-231	
Airport of Departure (Year, of First Carrier and Requested Routing) LOS ANGELES ER9S0097/26			
To LEJ DHL CARGO		By First Carrier USD PP PP MAX FREE	
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These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Ultimate destination GERMANY		Diversion contrary to U.S. law prohibited.	

1st time

Conversion scheme is defined manually and stored (identification of same type by pattern recognition)



X times

Documents of same type are scanned, identified by PatRec, converted and processed automatically.



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LOGICAL-Cloud

specific features



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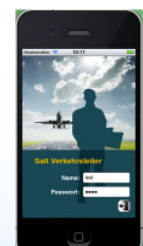
1. General philosophy

- **No „reinvention of the wheel“**
Instead: usage, integration, easy access to already established/available tools & concepts
- **Courage for „imperfection“/accept non-ideal real world**
Instead of standardization, common ontology, „single window/single document“
→ toolkit for semi-automatic interface connector for freight documents
- **Open System**
open for integration/linkage of multiple/redundant IT-tools
→ evolutionary process, competition of solutions

2. Data Access Control

- a) analogous to „Circles“-concept of Google+
- b) matching identified → notification → confirmation required

3. App-links with Data-Workspace (e.g. SALT traffic manager)



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For additional information



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