



Cloud Computing in Logistics

– Project LOGICAL: Basics, Use Cases, Achievements –

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Agenda



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Transnational logistics improvement through cloud computing
and innovative cooperative business models

- ▶ 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 Cloud computing and innov**A**tive cooperative business models

Duration: May 2011 - October 2014

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



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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)

Miscsic (HU) – PP 8, 9

Bay Zoltan Nonprofit Ltd. For Applied

Research

Misdoljn Plusz

Koper (SI) – PP 14, 15

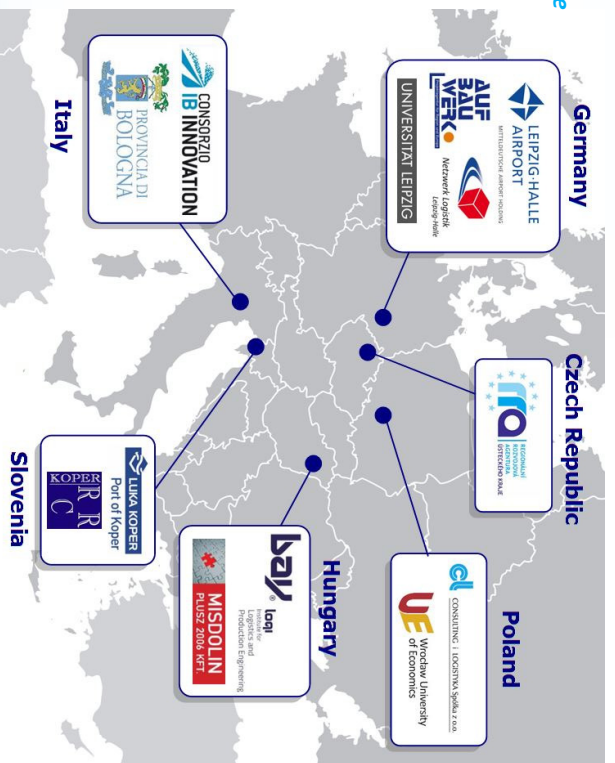
Luka Koper,

Reg. Dev. Centre Koper

Bologna (IT) – PP 11, 12

Province of Bologna,

Consorzio IB Innovation



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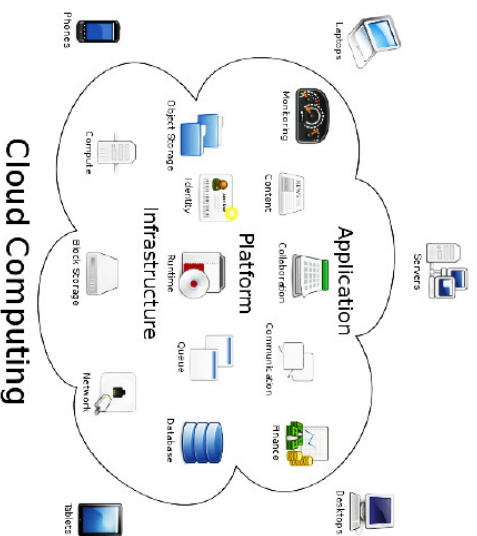
Cloud Computing ...



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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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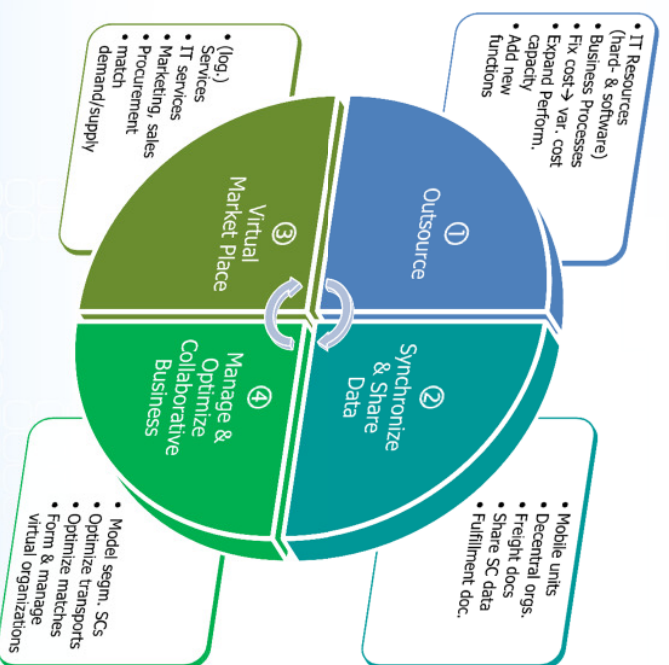
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LOGICAL-Cloud Use Cases



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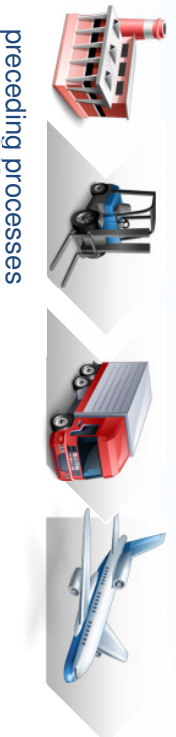
- System of functions & use case categories:**
1. IT-Outsourcing on demand
 2. Integration Workspace for Sync & Share of data → Secure Interoperability
 3. Virtual mall of services & service demands
 4. Management Platform for Collaborative Processes



Far Perspective



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

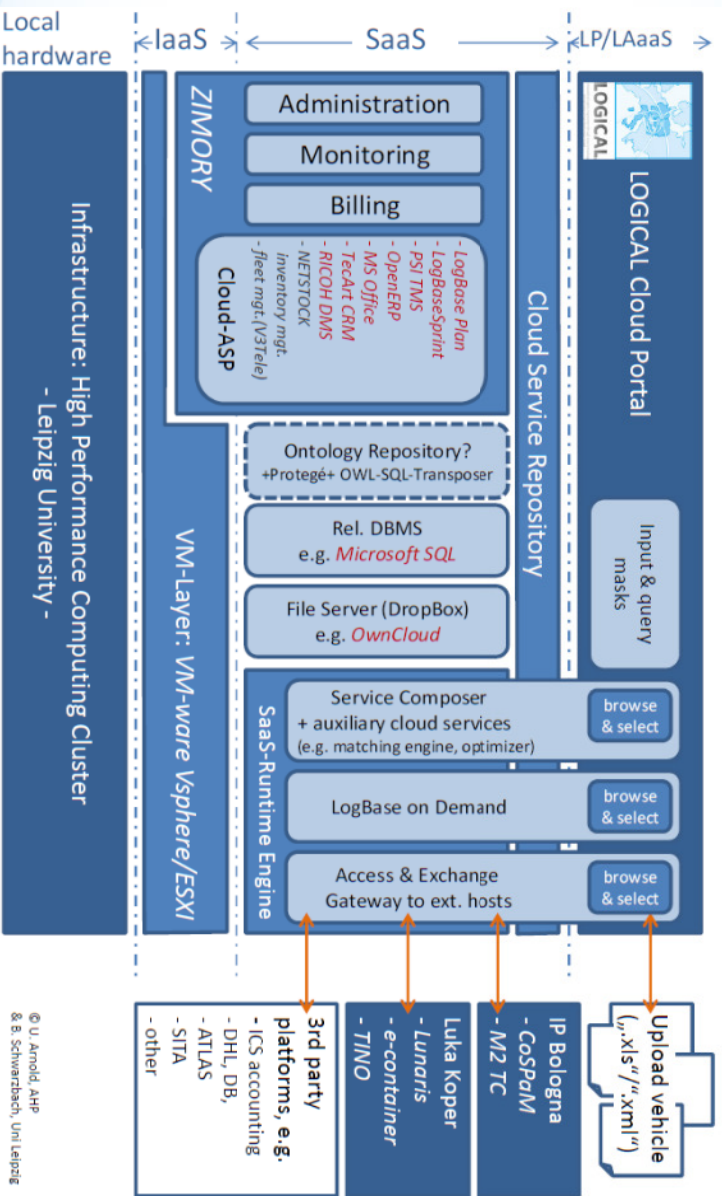


LOGICAL-architecture

technical view, Leipzig version 1.3



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& B. Schwarzbach, Uni Leipzig

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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 & and 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“



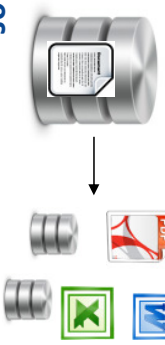
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- Which documents are convertible? → ALL, which have been processed once manually with recording the converting scheme...



1st time

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



X times

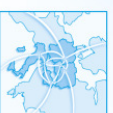
Documents of same type are scanned, identified by PatRec, converted and processed automatically.

615 IAX 69232505		615-69232505	
SHIPPER'S NAME AND ADDRESS COMMODITY FORWARDERS' BLDG 11101 S LA CIENEGUA BLVD LOS ANGELES CA 90045		SHIPPER'S ACCOUNT NUMBER AirWay Bill	
CONSIGNEE'S NAME AND ADDRESS C/O DHL MORGENTHAU 10000 WILSON BLVD ARLINGTON VA 22217		DHL CARGO 236 MENDALL H. FORD BOULEVARD 41018	
COMMODITY FORWARDERS, INC LOS ANGELES TELEPHONE: 1-310-348-8855		ORDER NUMBER: IF-231 CFI: IAX-493899 AES 1234: X20121214056539	
SHIPPER'S ACCOUNT NUMBER 02-1-10177/0016		CONSIGNEE'S ACCOUNT NUMBER IF-231	
SHIPPER'S CONTACT LOS ANGELES ER95097/26		CONSIGNEE'S CONTACT DHL CARGO	
DHL CARGO		DHL CARGO	
LETRPAG		LETRPAG	
PERISHABLE CARGO DO NOT DELAY* KEEP IN CHILL WHILE NOT IN TRANSIT WHEN POSSIBLE*		*PERISHABLE CARGO* DO NOT DELAY* KEEP IN CHILL WHILE NOT IN TRANSIT WHEN POSSIBLE*	
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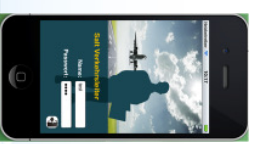
LOGICAL-Cloud



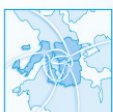
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specific features

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
 - „single window/single document“
 - toolkit for semi-automatic interface connector for freight documents
2. Open System
 - 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)



For additional information



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