TraSer
Open Source solution for Tracking and Tracing

Hans Wortmann

University of Groningen
Outline

• Vision
• From "proprietary" to "open" track and trace
• Multi-organisational perspective
• TraSer architecture
• Pilots
• TraSer project and partnership
• Conclusions
Vision: Auto-Id based track and trace for SMEs involved in any phase of the supply chain and along the complete SC
Third-party based tracking

- Tracking only when handled by one single transportation company
- Difficult access to tracking information
- Automated follow-up of delays only with proprietary systems
“Open” item tracking

- Tracking active for all companies involved in the delivery
- Delays can be automatically treated in real-time

*ID: identification
**URI: Uniform Resource Identifier
Manufacturing

TraSer objective

Warehousing / Logistics

open-source track & trace solution platform for SMEs involved in collaborative, changing environments

Retail
T&T relies on unique item numbers

• In closed systems, items must be numbered uniquely within the scope of the application
• In open systems, item numbers must be globally unique
• Most systems at present are closed and private
• ISO 15963 has complex management, low penetration
• Some community systems are under development:
  – EPC-Global
  – Sea containers
ID@URI

• TraSer relies *only* on Internet domains (URIs)
• Company or service specific URIs are used to make item numbers unique
• Item numbers (ID) may be:
  – ISO 15963 unique numbers (already worldwide unique)
  – Community-unique numbers (e.g. EPC-global)
  – Company unique numbers
• URIs are also used to identify the TraSer node that holds the item information
• Webservices (item updates and queries) can be accessed via the URI
TraSer architecture

- TraSer Server Node
- Item Info
- URI-A
- URI-B
- Internet
- TraSer Query Client
- ID@URI-B
- ID@URI-A
- TraSer Upload Client

Item Info
Example: propagating information updates for aggregate product (“composite”)

Client application

IU(10056754, ...)

Product Agent comp4.com

IU(1034, ...)

Product Agent comp3.fi

IU(1035, ...)

Product Agent comp3.fi

IU(261, ...)
IU(262, ...)
IU(263, ...)

Product Agent comp1.com

IU(264, ...)
IU(261, ...)
IU(266, ...)

Product Agent comp2.com
Propagating information updates to “interested” parties

- Defines one-to-many dependencies between objects so that when one object changes state, all its dependents are notified and updated automatically
Sample scenario

- Logistic Service Provider employs re-usuable transportation assets in closed circulation and performs their tracking.
- Items transported in re-usuable assets participate only once in the delivery process but can be tracked because assets are tracked.
- LSP can offer its own tracking data as a service for customers.
What IT infrastructure is behind the scenes?
Sample scenario, step 1

Real world

- Truck driver reads container's ID with portable reader and communicates to the LSP node that the container's location is now at SME's premises.
- LSP unloads empty container at SME's site.

TraSer network

- Container's location is now "SME".
Sample scenario, step 2

Real world

SME places items in the container of LSP

SME's site-bound reader reads the IDs of both container and transported material and tells SME node that they will now move together

TraSer network

SME's item is in LSP's container

Web client in office

Reader-equipped client

e.g. site-bound reader

TraSer node with database

Reader-equipped client

e.g. mobile reader at truck driver
Sample scenario, step 3

Real world

LSP picks up container with item and moves to new location

Truck driver reads container's ID with portable reader (if needed) and communicates the updated location to the LSP node

TraSer network

Location of SME's item is now "checkpoint n"

Container's location is now "checkpoint n"
Sample scenario, step 4

Real world

- SME wants to know where its item is

TraSer network

- Where is the SME item?
- SME item is at “checkpoint n”
Sample scenario, step 5

Real world

LSP wants to know if its container is free to be used again

TraSer network

Is container empty?

No, container has SME item in it

Web client in office
Reader-equipped client
TraSer node with database

e.g. reader-equipped client

Web client in office
Reader-equipped client
TraSer node with database
e.g. read equipped reader
So what are the benefits?

SME point of view

• Improved efficiency as SME uses its own system instead of different service provider, big company systems
• SME can extend TraSer to create basis for ”installed base management”

LogCo point of view

• Reduced investment in containers
• Higher productivity
• Happier customer, better market share and profitability
TraSer pilots

Teletalo pilot
LIMS
Itella role cage pilot
Innotec Data tracking pilot
Innotec SCM pilot
RFID Lab pilot
RedBite pilot
TraSer POC environment

- Roll cages are equipped with RFID tags and barcodes
- RFID reader gates installed on two Itella logistic terminals for fully automatic, direction aware identification of roll cages
- Handheld barcode readers for registering events at gateless and customer premises using bar code
- Goal of the pilot program is to track and trace roll cages by using RFID (now every year some 30,000 roll cages are bought to replace lost ones)
- Advanced tracing allows better planning of processes
TraSer partnership

Core Partners

- Computer and Automation Research Institute of the Hungarian Academy of Science
- Helsinki University of Technology
- University of Groningen
- Innotec Magyar Kft
- ITELLA (Finnish Post)
- TNO Information and Communication Technology
- Wittmann & Partner Computer Systems
Conclusions

- The TraSer project develops a light-weight, open source solution that enable SMEs to do tracking and tracing
  - http://www.traser-project.eu
  - Consortium with academic and industrial partners allows for pilot installations and real-world testing
  - Complementary to more “high-end” initiatives such as EPCglobal