

RFID Academic Convocation 2006

Tracking & Tracing of Returnable Transport Items and Pre-Finished Goods within the Automotive Supply Chain

Case Studies in the Field of Automobile Logistics

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Paradigm shift – conventional vs. autonomous control

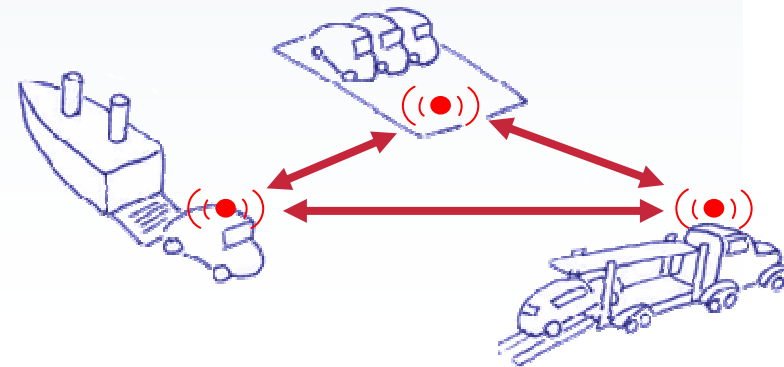
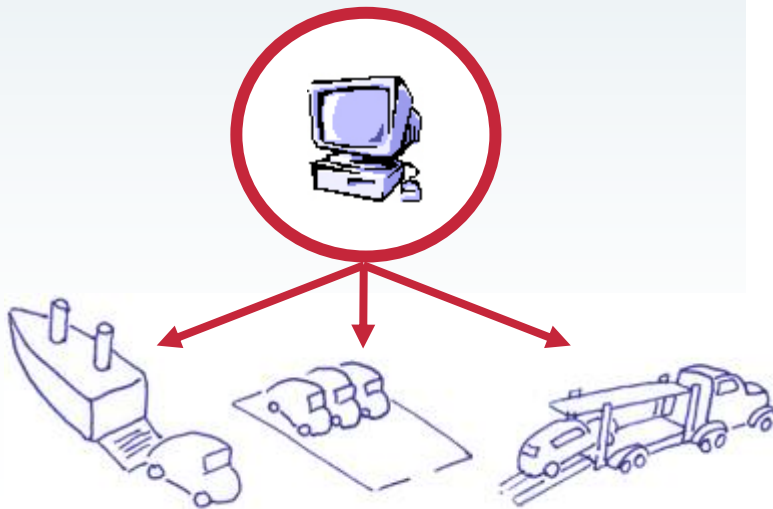
Conventional control

- Hierarchical structure
- Global information
- Central control

Paradigm
shift

Autonomous control

- Heterarchical structure
- Local information
- Decentralised control



- 1. Tracking & Tracing of Pre-Finished Goods**
- 2. Tracking & Tracing of Returnable Transport Items**

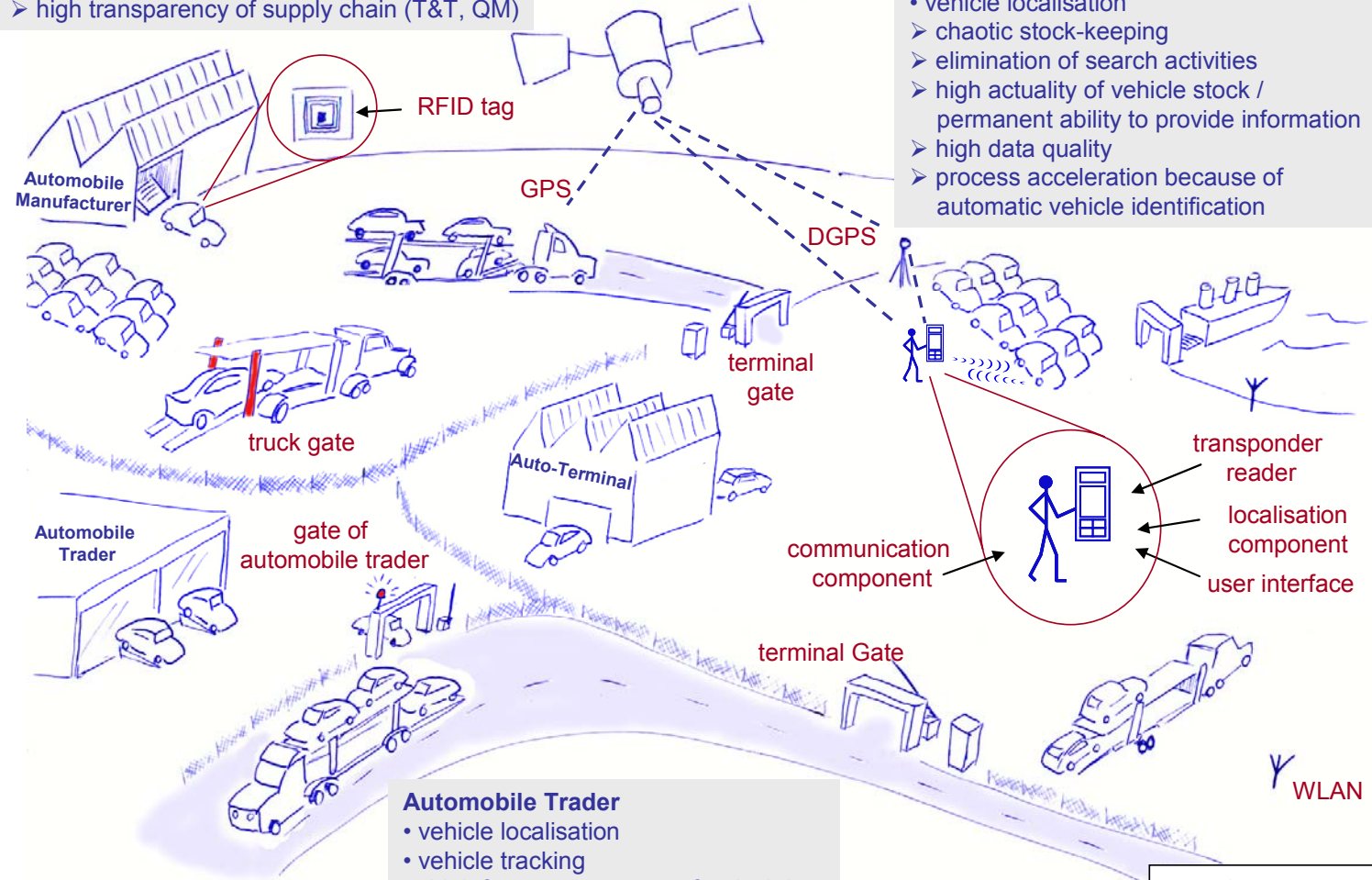
Usage of mobile technologies in automobile logistics

Automobile Manufacturer

- vehicle localisation within own compound
- vehicle localisation outside own compound
- elimination of search activities
- high transparency of supply chain (T&T, QM)

Automobile Logistics Provider

- vehicle identification
- control of vehicle orders
- vehicle localisation
- chaotic stock-keeping
- elimination of search activities
- high actuality of vehicle stock / permanent ability to provide information
- high data quality
- process acceleration because of automatic vehicle identification



Automobile Trader

- vehicle localisation
- vehicle tracking
- high forecast accuracy of arrival date
- high protection against theft

- tasks
- fields of application

Case study 1 - FasTer



E. H. Harms Automobile-Logistics

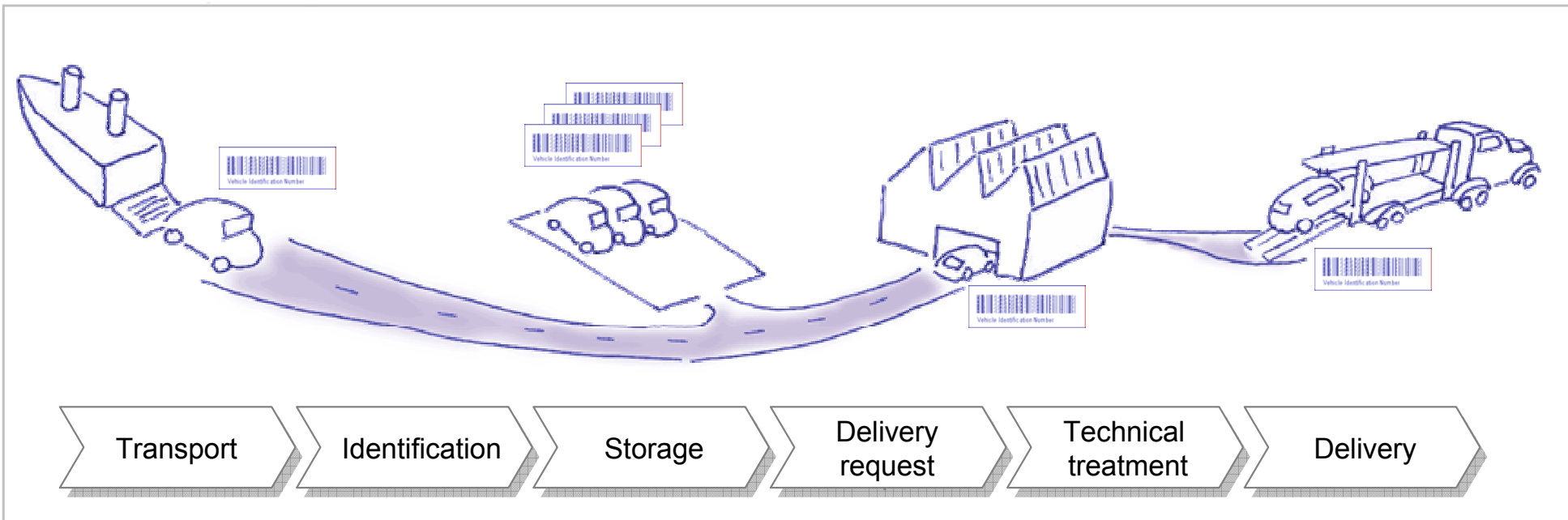


- Cooperation project “Autonomous Control in Automobile Logistics” between E.H.Harms Automobile-Logistics and the University of Bremen.
- Automobile logistics service provider for new and used vehicles
- in the range of transport, technical treatment, storage and handling of vehicles.
- Consisting of E.H.H. Auto-Terminals, E.H.H. Automobil-Transporte und E.H.H. Car Shipping.
- Europe-wide network with auto-terminals at strategically important traffic junctions.
- Transport of vehicles between automobile manufacturer, auto-terminals and automobile dealer via vessel, rail and truck.



Investigation of several possible fields of application of RFID-Systems based on the processes of an idealised automobile terminal.

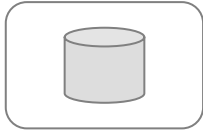
Current state – auto-terminal processes and weaknesses



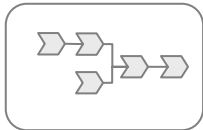
- Every vehicle is fitted with a barcode label, that contains the Vehicle Identification No.
 - Documentation of vehicle movements via bar code scanner or keyboard.
 - Several weaknesses of manual data entry in the field of automobile logistics:
 - Rain drops, condensate and snow on the windscreen makes scanning unreliable to impossible.
 - Bar code labels bleach when exposed to direct sunlight.
 - Incorrect or incomplete data acquisition and as a result high consequential costs.
- ↪ Manual data entry via bar code scanner or keyboard is error-prone, time-consuming and concerning its quality dependent on the competence of the responsible employee.

Opportunities for improvement

Adoption of transponders provides many opportunities for improvement, for example:



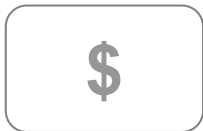
Improvement of **data quality** (complete and faultless data entry)



Process acceleration (immediate vehicle identification and passage documentation, bulk identification of entire truck loads)



Enhancement of **process transparency** (correct vehicle identification, complete documentation of vehicle movements, up-to-date vehicle stock)



Cost savings (decrease of costs resulting from faulty data entries, reduction of equipment cost through recycling of transponders)

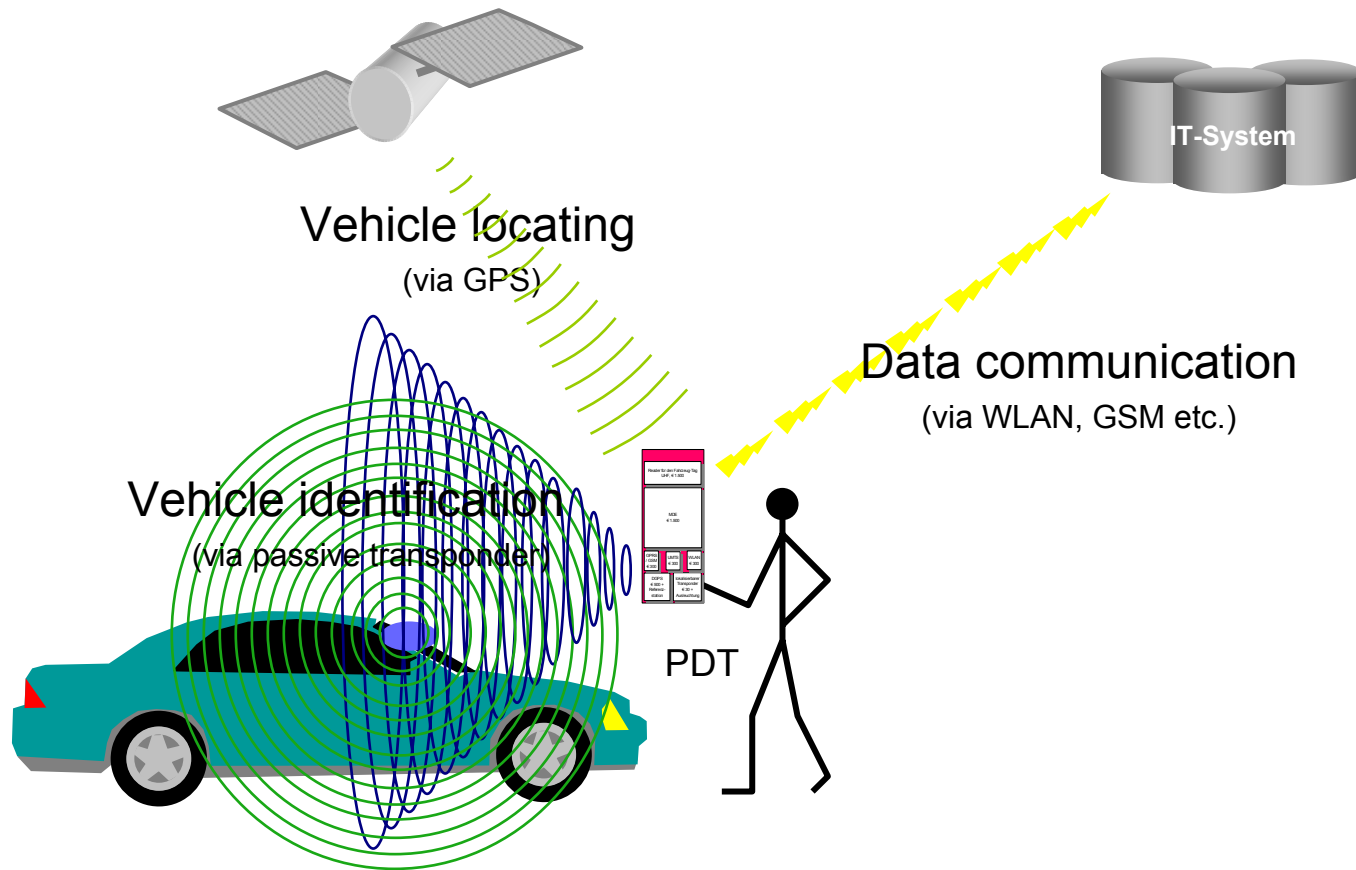


Improvement of **working conditions** (simplification of data entry tasks through more comprehensive and improved computer-aided support.



Protection and improvement of the **market position** (development of competitive advantages due to early adoption of innovative ICT)

Operation mode of the Hybrid-Solution



Tracking & Tracing of Returnable Transport Items (RTI)

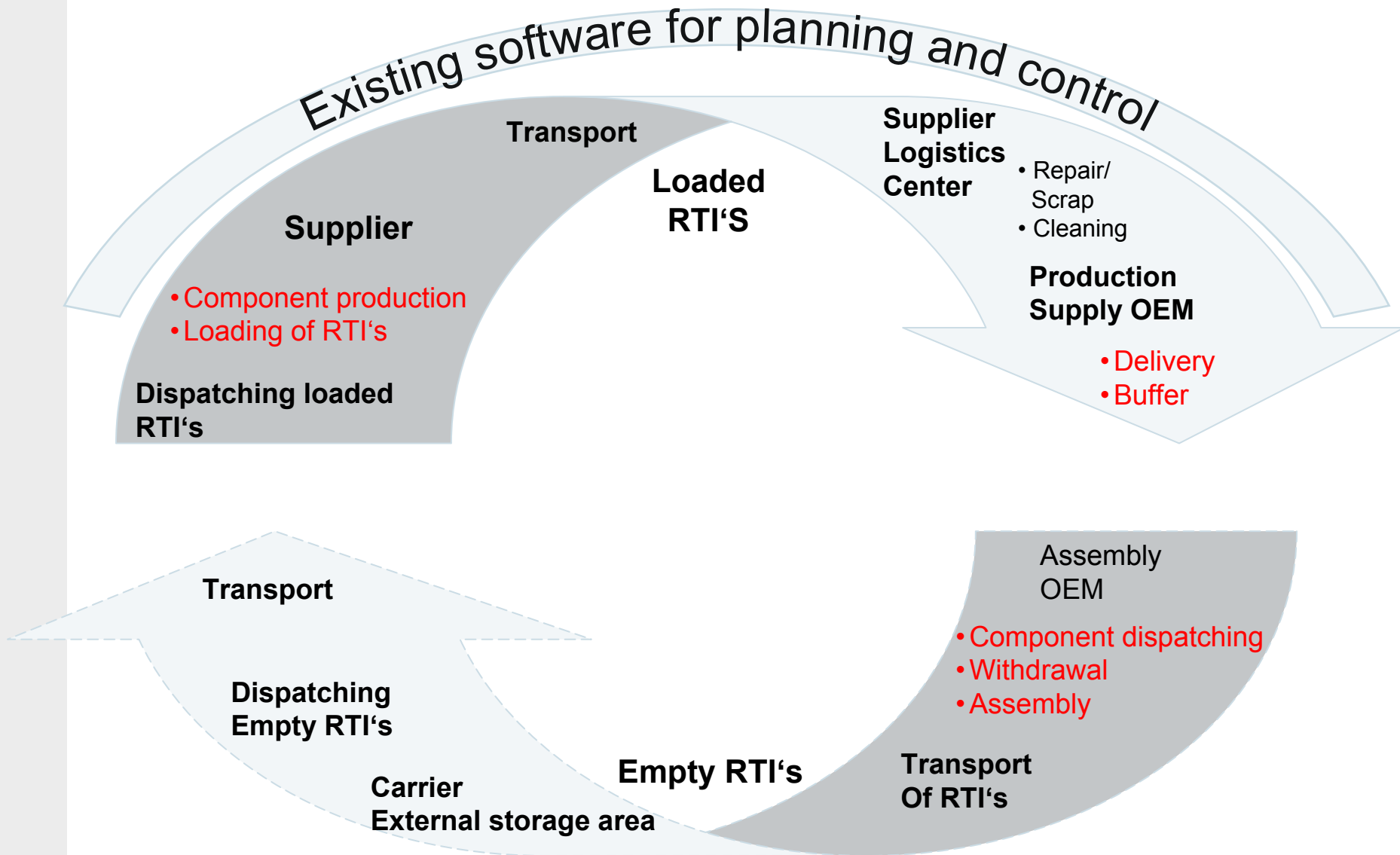
- Partners involved:
 - 3 project partners:

 - 2 pilot installations:

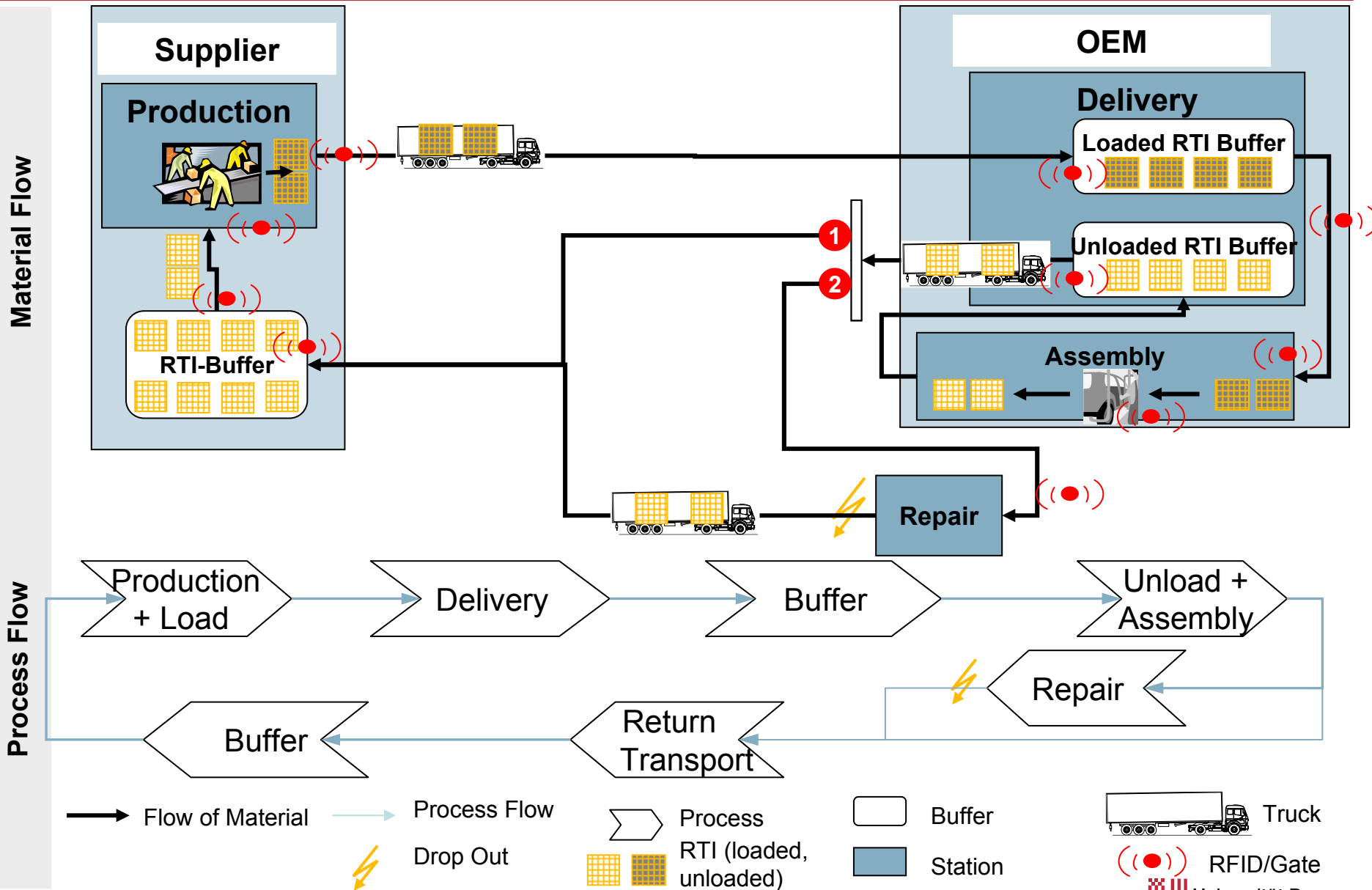
- Scope:
 - 75 man-month,
 - Volume ca. 550.000 Euro.

- Public funding:
 - BIA – Bremer Innovations-Agentur

Task: Integration of RTI's and flow of material



Seat supply cycle - schematic representation



Project goals

Improvement of process reliability

- Delivery of seats in sequence
- Loading of RTI's in sequence
- Delivery of RTI's to the right OEM
- Assembly of seats in correct order
- Reduction of costs and complexity

- Real time accurate asset data (quantity, location, load) for RTI's
- Reduction of circulating assets

Seat and RTI tagging



RTI's are equipped with two transponders

Removable transponder for seat frame

