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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Planning and Control of Production Systems

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Paradigm shift – conventional vs. autonomous control

1. Introduction
1. Tracking & Tracing of Pre-Finished Goods

2. Tracking & Tracing of Returnable Transport Items
Usage of mobile technologies in automobile logistics

1. Introduction

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

RFID tag
GPS
DGPS
terminal gate
truck gate
gate of automobile trader
terminal Gate
transponder reader
localisation component
user interface
WLAN
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.
- 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.
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.
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

Vehicle locating (via GPS)

Vehicle identification (via passive transponder)

Data communication (via WLAN, GSM etc.)
Case Study 2 - ProLadung

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

Existing software for planning and control

- Supplier
  - Component production
  - Loading of RTI's
  - Dispatching loaded RTI's

- Logistics Center
  - Repair/Scrap
  - Cleaning

- Production
- Supply OEM
  - Delivery
  - Buffer

- Assembly
- OEM
  - Component dispatching
  - Withdrawal
  - Assembly

- Empty RTI's
  - Transport
  - Carrier
  - External storage area
  - Dispatching empty RTI's

- Loaded RTI's
  - Transport
  - Dispatching loaded RTI's
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