



Carfinder: Real-time vehicle tracking for AUDI using IBM and Zebra Technologies

Overview

Business challenge

A growing range of models and ever-shorter development cycles increase the demands on the manufacturing process. As a result, tracking vehicles inside and outside manufacturing facilities is essential for delay-free quality assurance and to provide transparency throughout all manufacturing steps in the automotive industry.

Solution

In co-operation with AUDI, IBM® and IBM Business Partner Zebra Technologies designed and implemented the “Carfinder” project, a highly scalable solution for vehicle tracking in real time. Infrastructure, applications, and support processes are implemented within a single centralized system that provides all the information at a glance and thus fulfills an essential requirement for vehicle production.

AUDI AG currently manufactures the A3, A4, A5 and Q5 models along with associated variants at the Ingolstadt plant. Because of this large number of model variants, the plant in Ingolstadt is one of the most complex manufacturing facilities in the VW group. With the success of the Audi brand and the rapid development of the variety of models in recent years, more vehicle launches can be managed at shorter time intervals. In order to improve the overview of the intricate interconnections, AUDI AG intends to support the production process with a vehicle tracking system that can be integrated seamlessly into the Audi infrastructure.

For the implementation of the “Carfinder” project, AUDI sought a system integrator that could also take over the design, installation and commissioning of a vehicle tracking system within the plant at Ingolstadt. After extensive testing, AUDI chose the RTLS (Real Time Locating System) technology of IBM Business Partner Zebra Technologies, while IBM Global Technology Services® was entrusted with project implementation.

Advantages of real-time tracking

Real-time tracking allows the determination of the whereabouts of all new vehicles on the premises to within a few metres, enabling their tracking throughout the entire production process right through to the outer parking areas.

Due to the increasing diversity of models, parking areas in Ingolstadt are in short supply and their use has to be optimised to avoid delays.

For quality assurance and audits during normal operation, vehicles previously had to be taken out of the manufacturing process, and then re-introduced again within a tight schedule. This led to delays and an additional need for coordination between the departments involved in manufacturing and inspection of vehicles. The real-time tracking solution for all indoor and outdoor areas offered a previously unknown transparency to the position of each vehicle, allowing the timely management of all processes, as well as a vast improvement in quality.



Business Benefits

- The close link between the physical manufacturing of products and their digital counterparts in the computer system offers transparency and certainty at all times for employees.
 - Modern production processes with real-time tracking fulfils the high quality requirements for production with the introduction of many new vehicle and increasingly short cycles.
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Implementation of the “Carfinder” project

The AUDI “Carfinder” solution from IBM and Zebra Technologies is highly scalable and extensible. By integrating infrastructure, applications and support processes within a single centralized system, all important information is available at a glance, thus fulfilling an essential requirement for production.

The vehicle tracking system consists of tracking sensors from Zebra for both indoor and outdoor areas, which are connected to the internal network. At the beginning of the manufacturing process, all vehicles are equipped with active RFID tags, which are then removed before vehicle delivery and reused in the production process. The transponders of Zebra Technologies are in accordance with the standard for RTLS (Real Time Location Systems). The system has a range of up to 1750 metres and offers precise location accuracy. All radio systems used were certified by AUDI for use in production prior to implementation.

The RFID transponder periodically sends signals to the Zebra sensors. The co-ordinates and zones of the individual vehicles can be accurately determined as a result of the time difference between the signal inputs at the sensors. The former are then passed on to the downstream systems of AUDI and VW. This enables accurate tracking of each vehicle from the various stages in the production halls to the parking spaces outside.

IBM Global Technology Services installed and implemented the solution as systems integrator in close cooperation with AUDI. IBM also took over the connectivity to AUDI and VW’s existing IT systems for quality control, visualization, and other applications.

New challenges that naturally arise in innovative IT projects of this magnitude were promptly resolved. The AUDI “Carfinder” project was completed successfully by IBM and Zebra Technologies in the planned time frame.

Following the installation of the “Carfinder” real-time tracking solution, IBM Global Technology Services will provide ongoing support for the entire solution.

Flexible configuration for every need

The tracking concept involves a number of areas with varying requirements with respect to the accuracy of real-time location. Thus, there are zones in which only the whereabouts of a vehicle is registered, passage areas where only drive-through detection is called for, and special areas and outdoor areas where precise localization is needed to an accuracy of less than three metres.

The path taken by a vehicle in the production process can be tracked in a graphical representation of vehicle movement. The required data are also recorded for subsequent specific improvement of the processes, but without producing excessive storage of “information overflow” details.

Solution Components

Services

- IBM® Global Technology Services®

IBM Business Partner

- Zebra Technologies
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“The feedback from production is very positive. The new system has already proven itself at the first production start of a revised vehicle model.”

— Jürgen Schneider, Technical Project Manager,
AUDI

Progress through technology

With the “Carfinder” project, AUDI has reaffirmed its motto “Progress through technology” by using the technologies of today for the mobility of tomorrow. This allows the vehicle manufacturer to continuously introduce advanced production processes and optimize them to meet the high and ever-increasing quality requirements resulting from many new car launches and faster product cycles. An expansion of the solution to cover additional areas in the Ingolstadt plant is already being planned.

With the implementation of the “Carfinder” project at AUDI, IBM and Zebra Technologies have provided a more intelligent solution that combines the physical manufacturing of products with the digital world to offer significant advantages for the employees in manufacturing. With real-time tracking of the whole production process, production progress can be comprehensively and continuously measured and monitored. This allows AUDI to make decisions based on real data and not, as before, only on the basis of simulations. By analysing this data, improvements can be very quickly implemented on the spot. Jürgen Schneider, Technical Project Manager at AUDI confirms: “The feedback from production is very positive. The new system has already proven itself at the first production start of a revised vehicle model.”

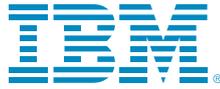
About Zebra Technologies

Zebra Technologies Corporation offers a comprehensive range of solutions to identify, locate and track assets, transactions and people. With these solutions, companies can increase their productivity. Zebra helps customers in over 100 countries worldwide with their solutions in the areas of on-demand specialty digital printing, RFID and tracking in order to build intelligent and better-integrated infrastructure, thus contributing to significant improvements in transparency and business performance.

To learn more about products, services and solutions from Zebra Technologies, visit: www.zebra.com

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