

From image recognition to 3D printing

## Digital supply chain at Siemens Mobility

With the help of digital technologies such as image recognition, artificial intelligence and machine learning, Siemens Mobility is enabling mobility operators worldwide to increase value sustainably over the entire lifecycle and guarantee availability. The concept: Identification of parts within ten seconds, order completed in three minutes and delivery within 24 hours. In this process, the part in question is scanned, the spare part is ordered via an online shop and, increasingly often, a 3D printer makes urgently needed components. Siemens Mobility has created a unique infrastructure for this in the rail industry.

The unimpeded use of trains and rail systems is the most important criterion for the acceptance and use of public transport – today as well as in the future. Unforeseen downtimes cause high costs and inefficiencies, and are all the more annoying when trains are forced to stand still because of missing spare parts. But even if a train's availability isn't restricted, defective components are often visible and damage both the image and public acceptance of transport companies. The goal of Siemens Mobility's material supply system is to restore the function of components as quickly and reliably as possible. To achieve this, the company has relied on digital instruments from a very early stage. Today, Siemens Mobility has all the building blocks in place for ensuring a consistently digital and largely automated supply chain for spare parts – all the way from ordering to production to delivery.

### **Photo matching for component identification**

The latest building block in the system – the so-called “Easy Spares Idea” – closes the last gap in the digital supply chain. The only technical requirement for the automatic identification of components, a feature that was introduced in 2018, is a smartphone with the related app. If a driver or mechanic discovers a defective component during a routine check – such as a damaged video camera or interior

paneling, they use the app with a built-in camera function to photograph the defective part. Removal of the part isn't necessary. The photo is then checked in Siemens Mobility's cloud-based CAD database to identify the part.

Siemens Mobility uses image recognition and machine learning technologies for identification purposes. Since the system's artificial intelligence learns continually, it can keep making better and faster matches. Today, "Easy Spares Idea" can make a match in 90 percent of the cases – and in just ten seconds. This prevents the ordering of wrong parts and significantly reduces administrative costs for the customer.

"Easy Spares Idea" is available today for the current Avenio and Neoval vehicle platforms, whose components were designed three-dimensionally in CAD systems by Siemens Mobility. Future vehicle platforms will also have this functionality.

### **Digital high-tech also at the other end of the supply chain**

Siemens Mobility has ambitious goals for its end-to-end supply chain: Each component must be identified within ten seconds, the order process should take no longer than three minutes, and each part has to be delivered within 24 hours – a company pledge that applies across the entire European Union.

A particularly innovative process is increasingly being used. Under the heading "Easy Sparovation Part," Siemens Mobility lists more than 800 parts that are no longer physically kept in high-bay storage, but are available in the form of data sets in a virtual warehouse. When needed, a data set is downloaded to a 3D printer at a Siemens Mobility location, and the urgently needed part is immediately printed. Well over 8,000 separate parts have been made with additive manufacturing since 2014 and supplied to customers. Siemens Mobility holds a truly unique position here industry-wide.

### **From identification to ordering**

Whether they be 3D prints or traditionally manufactured components, spare parts must be easy to order and delivered quickly. To ensure this, Siemens Mobility operates an online marketplace that is open 24 hours a day, seven days a week.

More than 220,000 different individual items are currently available there – covering a total of seven product groups.

When it comes to eCommerce platforms, Siemens Mobility is a true pioneer: It has been operating an online global marketplace since the year 2000. In the past, Siemens customers were able to order products from around 3,000 suppliers in the so-called “Rail Mall” – but only directly through Siemens Mobility. Since 2018 – and initially restricted to Europe – third-party providers can also offer their products in the Siemens Mobility online shop. By integrating other sellers in the shop, the company hopes to further increase the number of deliverable products.

### **Online shop with tangible customer value-added**

From the customer’s point of view, the opening of the online shop represents true added value. The “Easy Spares Marketplace” enables true one-stop shopping. One no longer needs to study the catalogues of various suppliers, register in numerous sales portals, spend time negotiating supply contracts or opening accounts and deal with the processing of payment transactions. In addition, there are no requirements for minimum quantities and no separate shipping costs. As a result, the customer benefits from significantly reduced efforts and lower costs.

The highest online shop standards are also ensured in the application: Parts can be searched by keywords, materials and article numbers. The spare parts are shown in photos and drawings. To provide faster identification of a part when in doubt, 360-degree views are provided so the part can be rotated and viewed from all sides.

### **Advantages for sellers as well**

Customers aren’t the only ones to benefit from the “Easy Spares Marketplace.” Suppliers of Siemens Mobility and other rail industry providers can also use the online marketplace infrastructure with its 350 customers and 2,200 registered users. A separate sales portal is no longer necessary. And suppliers can leave processes like invoicing or account assignments to Siemens Mobility. Deliveries are made directly by the suppliers.

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