Integrated mobility with eTicketing

The intermodal and interoperable eTicketing platform for consistent, end-to-end mobility chains in cities

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Need for new traffic solutions

The percentage of the population living in cities is steadily rising. In line with this trend, transportation needs are continuing to grow and present new challenges to modern urban development. To sustainably address the growing volume of traffic, and shift traffic to environmentally friendly forms of public transportation, new and attractive transportation solutions that are convenient for passengers are required. One key to meeting this need is eTicketing.
Increasing traffic

According to estimates, 60 percent of the population worldwide – or roughly five billion people – will live in urban areas by the year 2050. Experts predict further growth in passenger traffic, and private transportation is expected to grow by around 2.7 billion trips per day between 2005 and 2025. Many cities already suffer from endless traffic jams, a shortage of parking spaces, and massive air pollution – factors that play a significant role in international city rankings, and significantly impact inhabitants, visitors and industry. An efficient traffic concept that makes public transportation more attractive and combines it with private transportation is the only viable solution for the future.

Demand for convenient mobility solutions

In view of the wide range of different modes of transportation and fares, selecting the best ticket often represents a hurdle – particularly for passengers who only occasionally use public transportation. For many passengers, the additional time required to purchase individual tickets and the need to have the right change to hand causes them to shy away from using public transportation. That’s why new convenient, user-friendly concepts are needed to offer a valid alternative to motorized private transportation.

Siemens and eTicketing

Siemens has concentrated a wide range of expertise and activities in the Infrastructure and Cities Sector to address the most urgent issues and developments in urban areas. These include solutions that tilt the modal split toward public transportation. Now, for the first time, a wide variety of eTicketing solutions and expertise which Siemens has successfully brought to the market over the years will be bundled in the City IT Business Segment. Siemens is ideally positioned to supply eTicketing systems in various configurations and on different scales, all from a single source.

eTicketing: the freedom to travel

eTicketing delivers an answer to current challenges in passenger transportation. Electronic tickets not only replace paper tickets, they offer many additional features and can additionally be used for all modes of transportation. Passengers can transfer seamlessly between different transportation systems without having to waste time purchasing individual tickets and selecting the correct fare. Fees are calculated at the end of the trip, and passengers pay only for the services they used – automatically, electronically, transparently, and securely.
The intermodal and interoperable eTicketing platform for consistent, end-to-end mobility chains in cities

As a system supplier, Siemens is always one step ahead of “state of the art”: Siemens supplies eTicketing systems that support different international standards and offer a solid technological foundation for successful eTicketing projects. They provide maximum protection of investments while allowing customers to benefit from international innovations. At the same time, Siemens places great importance on ensuring broad acceptance and safeguarding customer interests, for example by obtaining a variety of certifications for the individual solution components.

To meet the diverse requirements, the Siemens portfolio contains solutions for both open and closed transportation systems. In both systems, aspects such as ease of use, data security, and revenue security play a primary role. The modular range of Siemens products and services covers everything from cabinet systems and validators, the wake-up and reader components for BiBo, and a central backoffice sales system to the necessary smartcards and an innovative mobile ticketing system.

**Be-in/Be-out (BiBo)**
The contactless BiBo principle makes it easy for passengers to transfer from one mode of transportation to another. Passengers can enter and exit without actively scanning their smartcard on a access control system. The mode of transportation being used as well as the passenger's entry and exit points are automatically captured via radio frequency.

**Check-in/Check-out (CiCo)**
In contrast to BiBo principle, in CiCo systems passengers need to actively scan their smartcards into the specific access control systems.
**Smartcard**
The smartcard is the key component for registering trips on different modes of transportation as well as for the intermodal use of additional mobility and leisure activities. Thanks to its dual functionality, the Siemens smartcard can be used in both BiBo and CiCo systems.

**Backoffice system**
PT®nova is a central backoffice sales system that brings together all the data of the upstream sales components and enables a coordinated exchange of data from the smartcard to the card reader to accounting. The system handles customer and contract management as well as chip card and device management.

**Ticket inspection**
Each eTicket contains a trip authorization that is stored along with all relevant ticket information on the smartcard. When the ticket is checked, the eTicket is read using mobile readers or stationary control terminals. This process verifies the validity of the ticket and checks whether it has been blocked by the backoffice system.

**Payment methods**
Payment by credit balance, direct debit, or credit card: During registration, passengers can choose between postpaid and prepaid payment options, which also allows them to travel anonymously and without specifying personal data.

**Access via cell phones**
Thanks to the Mobile Ticketing app for cell phones and smartphones, in addition to purchasing location and time-dependent tickets, passengers can also access additional information services such as fare and schedule information as well as up-to-date announcements.
From the smartcard to the back office

As the leading provider of complete state-of-the-art mobility infrastructure, Siemens supplies integrated end-to-end solutions for electronic ticketing systems throughout the entire value chain.

**Smartcard:**
**an intelligent card supports mobility**

The smartcard developed by Siemens is a key component for networking different modes of transportation. The size of a credit card, it is equipped with an active RFID chip, and is used to register individual trips. The smartcard can be used in Check-in/Check-out and Be-in/Be-out systems as well as interoperably and across modes for public transportation companies and other mobility providers. It is also possible to combine these systems.

**Cell phones and smartphones:**
**mobile access media**

Electronic tickets can also be used via alternative access media such as cell phones. This makes it possible to use location-specific services such as route planning, navigation, and timetable information, too.

**BiBo technology:**
**wireless RFID technology for convenient travel and billing**
CiCo: incredibly simple

With eTicket systems that use the Check-in / Check-out principle, the smartcard is registered on the specific access control systems at the beginning and end of each trip. In contrast to BiBo systems, passengers actively scan their smartcards into the system. As is the case with Be-in / Be-out systems, the fares are collected and can be paid via invoice or direct debit on a regular basis – monthly, for example. The CiCo principle can be implemented for both open and closed transportation systems.

BiBo: the system of the future

The Be-in / Be-out principle makes it possible for passengers to enter and exit different modes of transportation without their smartcard being actively scanned by a reader. The eTicket, which consists of a card with an integrated chip, does not even have to be visible. Passengers can carry it in their pocket, their wallet, or their jacket. The smartcard is automatically captured when entering and exiting the vehicle as well as periodically during the trip. The system automatically registers the routes travelled as well as any class transfers, and charges the passenger for the most favourable fare. Travelers no longer need to pay in advance; instead, they enjoy the convenience of paying afterwards by either being billed or via direct debit. BiBo offers customers ultimate convenience with minimal effort.

PTnova backoffice system: central sales and customer management

As a SAP®-based central backoffice system, PTnova is designed for sales and customer management of transportation companies and supports the sales business processes of transportation companies of all sizes. Based on the sales processes, the modular design maps all the sales processes of a transportation company. In addition to customer contract management and account management, fraud management, and accounting, PTnova also offers features for managing data, interfaces, devices, and materials, as well as for complaint management. In addition, PTnova provides information regarding customer relationship management, which makes it possible to implement loyalty programs.

As an industry-specific certified add-on, PTnova is integrated directly into SAP and automatically transmits all the sales data in a compressed format to financial accounting. This significantly reduces accounting and controlling-related costs and maintains the necessary data quality. Compliance with the generally accepted accounting principles (GAAP) is certified.
Your supplier of integrated, interoperable eTicketing systems

One of the greatest challenges facing cities and regions is how to balance growth and quality of life. Mobility that is energy efficient, sustainable, and attractive to passengers plays a key role in achieving this goal.

Interoperable and intermodal

The objective of sustainable transportation solutions is to create consistent, end-to-end mobility chains in cities and achieve balanced mobility solutions by linking different means of transportation. To this end, the eTicketing platform from Siemens combines public transportation with car and bike sharing systems and metered parking spaces as well as with non-transport-related services. This is made possible by integrating payment systems of connected partners as well as for leisure, sports, and cultural activities. The integrated mobility platform from Siemens further simplifies the comprehensive use of mobile services: e.g. route planning, door-to-door navigation, and the individual booking of services complete the range of features.

Scalability

Whether for individual companies or regional or nationwide associations, Siemens offers a scalable solution that can be customized for a wide variety of operator models. As a multi-client-capable backoffice system, PTnova is suitable for centralized use in cooperative ventures without undermining the independent accounting procedures or the data sovereignty of customer records for the companies involved – the prerequisite for a consistent, end-to-end intermodal transportation network.

Future-proof

To ensure smooth communication between the involved organizations, the infrastructure needs to have a standardized technical design, and the information exchanged across regions needs to be logically standardized. The eTicketing solution from Siemens is based on international standards such as Calypso and VDV Core Application and is compatible with country-specific standards. The open system architecture makes it possible to integrate future standards and developments.
Data protection

The eTicketing system from Siemens complies with currently applicable data protection laws. In designing the system components, high priority was placed on data protection and data security. The principle of data minimization advocates collecting and storing only the data needed for a specific purpose. In addition, by selecting their payment method, passengers can decide whether they wish to travel anonymously and whether to disclose their personal data.

Individual financing solutions

In addition to consulting concepts for all technical needs, Siemens offers individual financing solutions for each project. When it comes to financing questions, we cooperate closely with experts from Siemens Financial Services. The solutions that are developed as a result of this cooperation are customized to address specific requirements such as the size of the company and the investment volume. Depending on the requirements, individual leasing packages can be created as well.

Everything from a single, proven source: Siemens

Thanks to extensive years of experience and development in different technological areas, for the first time Siemens is offering a complete spectrum of eTicketing services from a single source – from smartcards to access systems to the back office, and from design to installation to service. Innovative solutions such as Be-in / Be-out and Check-in / Check-out were developed especially for interoperable, intermodal transportation networks, and are being used in international reference projects. Depending on the existing infrastructure and requirements, Siemens offers individual system solutions and operator models that can be flexibly implemented and financed.

Benefits for passengers

• Convenient and time-saving travel using many modes of transportation
• Consistent use of a medium for all modes of transportation as well as supplementary services
• Cashless ticket purchasing
• The most favourable fare even for those unfamiliar with rates
• Transparent billing and a cost overview can be accessed at any time
• Use of discount programs
• Comprehensive data protection

Benefits for operators

• Increased attractiveness of public transportation
• Enhanced image through state-of-the-art sales technology and ticket design
• Increased customer satisfaction through more convenient use
• Reduced operating costs for ticket sales and data collection
• Optimized offerings to reflect actual need
• Creation of rate offers as well as loyalty programs
• Reduced ticket fraud due to improved safeguards against forgery
Siemens eTicketing moves cities worldwide

Siemens bundles its wide variety of expertise, developments, and years of experience in many relevant areas and, for the first time, offers complete eTicketing solutions across the entire value-added chain. The different solution modules have already been launched in numerous projects around the world.

PTnova backoffice system

Siemens designs and implements back office solutions that are tailored to all relevant business processes as well as the existing system landscape. The realization of the sales and customer management system is being handled together with subsidiary company HanseCom. As a provider of complete IT services, the company can draw on more than 20 years of experience in public passenger transportation.

PTnova is the central control centre for all sales areas: flexible, secure, transparent, and reliable. Numerous projects have already been successfully implemented. Customers include the Belgian Railways (SNCB/NMBS), the Wiener Linien, Berliner Verkehrsbetriebe and Basler Verkehrsbetriebe. In the field of sales solutions, HanseCom is one of the leading providers in Europe.

BiBo – the ticket system of the future

In 2010 Siemens in Switzerland continued to develop the eTicketing system based on the Be-in/Be-out principle. Thanks to the use of wireless system components and sophisticated technology, it has been possible to significantly reduce the costs compared to earlier systems. The new system is based on international eTicketing standards and offers an integrated system architecture that extends to accounting. BiBo primarily offers convenience for passengers and transparency for operators. The Swiss Federal Railways (SBB) and the Swiss Association of Public Transport (VöV) are currently planning a ticket conversion. All conventional tickets should be replaced by 2017, and only one ticket will be offered that will offer everyone the convenience of a subscription. This would mean the innovative BiBo solution would be in operation in Switzerland for the first time.
**CiCo eTicketing system**

For Portuguese rail operator Comboios de Portugal CP, Siemens developed an eTicketing solution that provides seamless networking with the multimodal OTLIS transportation provider in Lisbon. The CiCo-based system was integrated into the existing infrastructure and is based on international Calypso RFID standards. As the system integrator, Siemens provides the relevant hardware such as the access gates, validation equipment, and video monitoring, which is administered and controlled in a central management system that is also maintained by Siemens. During this process, special attention is paid to specific customer requirements relating to passenger flow, security mechanisms, and operational processes.

**Mobile ticketing**

With over 175,000 users, Siemens has implemented the most widespread mobile ticketing system in Germany. Since 2007, Siemens subsidiary company HanseCom has been developing and operating the HandyTicket Deutschland project coordinated by the Association of German Transport Companies (VDV). Over 25 local transportation providers in 19 local transportation regions are now connected to the interoperable system. The solution’s multi-client capability makes it possible for multiple transportation companies and associations to access the same system simultaneously without receiving client access to the data or the user management features of another client. With its VDV Core Application compliance, the system meets all the requirements of the German eTicketing standard.

Passenger benefits: Register once and travel everywhere. As an interoperable solution, the entire range of tickets is available in the different regions at any time and from anywhere without ever needing to have the cash to hand.
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