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UPSTREAM MOBILITY

Modernizing cities and communities with improved sustainability

Industry

Energy and Utilities

Service

Mobility Solutions

Technology

Assisted Reality with Smart Glass

Project Timeline

10 Months

Client Profile and the Initial Situation

Upstream Mobility: Ensuring mobility for everyone

As part of the “smile” research project, the combined use of public, collective, and individual mobility services as an alternative to owning a car was evaluated. As the logical next step, Wiener Stadtwerke founded the daughter company “Upstream - next level mobility GmbH” at the beginning of 2016. Upstream Mobility ensures the expansion and management of its own digital infrastructures, expands digital services, and acts as a central integrator and contact for connected urban transportation. Their goal is to ensure mobility for everyone in all areas of life. To achieve this vision, they develop the digital infrastructure for tomorrows’ non-discriminatory transport system and offer it to cities and commercial suppliers worldwide. Upstream Mobility’s municipal background enables them to develop products and services that focus on public interest.

Indoor navigation for the visually impaired

Anyone who has ever been forced to find their way around a big city and a dense transport network knows how difficult it can be to find your way. As a rule, travelers rely on signposts, information desks or maps, offline or online, to get to their destination. And now imagine how challenging it must be for someone who is visually impaired and have no access to the usual visual navigation aids. To solve this problem, two project partners have joined forces: Upstream Mobility and Nagarro.

Together, we have proved to be innovation leaders in our respective fields bringing state-of-the-art technology at the fore to simplify complex problems and making every day live simpler and accessible to everyone. The aim of the joint project primarily involved:

- Building an indoor navigation solution for travelers in public spaces
- Evaluating an orientation aid for visually impaired individuals in underground stations using state-of-the-art technology.

The Solution

Digital assistants such as smart phones can and are already used for navigation in public spaces. However, it is becoming clear that smart glasses are also increasingly suitable technology for the masses and can provide great services, especially in terms of orientation, also for end customers.

During this pilot project, we were able to successfully test Smart Glasses as an orientation aid in underground trains for individuals with visual disabilities.

AI-supported Smart Glasses for indoor navigation

In the first application scenario, we used Smart Glasses for visually impaired individuals. The essential information gets displayed in the field of vision of the smart glass user. The virtual and real world are being merged on a Smart Glass device. Audio cues and heads-up information, i.e. the information in the user's field of vision, are used to guide them through the underground stations. The Smart Glass is controlled via voice input and/or touch function. The current position is communicated to the user with a few options of available destinations and POIs (Point-of-Interests), such as available exits, cafes, emergency services, etc.

The visually impaired individuals are navigated to the desired destination via additional audio instructions.

Various obstacles, such as benches or columns as well as temporary warning signs are recognized by the Smart Glass via AI-supported algorithms and transmitted to the users via audio function. The data glasses act as a virtual assistant for visually impaired metro users and ensure more freedom of movement and increased safety for passengers on public transport.

The pilot project provided the first important insights into whether and how smart glass-based indoor navigation can help people with visual impairments in the future.

Technology used

The solution uses a CMS platform to define so-called POIs (Point-of-Interests) and waypoints, which are linked to a web-based user interface. Bluetooth Low Energy Beacons are the basis for indoor positioning and navigation. Furthermore, an Android library is used for positioning and calculating the shortest route. The information is retrieved via Smart Glass - in the current application via Google Glass.

Potential future use cases:

1. Customers who use smart glasses to book their ticket for a public transport service are shown when the next underground train is leaving, are routed to the nearest bus or taxi station or receive information on whether there are any disruptions in that moment.

2. The use of smart glasses is also beneficial for employees of public transport companies. For example, ticket inspectors can be assisted in checking tickets.

3. Great importance is attached to reusability for other smart devices, for example for smart watches, audio support on headphones and the like.

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The testing of new technologies such as smart glasses in the context of mobility is intended to help modernize existing infrastructures and public transport services. On the other hand, smart glasses help cities and municipalities to improve road safety and ensure safe, accessible, and sustainable transport systems for all. Moreover, the use of modern tech like Smart Glasses contribute to the inclusion of disadvantaged groups to make optimum use of public transport and building a more sustainable and inclusive community.

Impact to Business: Ensuring safe and sustainable mobility for everyone

Sustainable effects and customer benefits:

- Promoting sustainability in cities and communities
- Ensuring inclusion of specific groups of people
- Modernizing existing infrastructure and services of public transport operators significantly
- Improving road safety
- Enabling access to safe and sustainable transport systems

Client Testimonial

"The modernization of existing offers of public transport operators and the access to safe and sustainable transport systems is a central concern for us. Therefore, it was important for us to test the use of smart glasses for indoor navigation in a pilot project. Nagarro proved to be the ideal partner due to its experience in the field and the project has provided us with important insights for the future!"

Thomas Binderhofer
Tech Scout Research & Development
Upstream Mobility

About Nagarro
In a changing and evolving world, challenges are ever more unique and complex. Nagarro helps to transform, adapt, and build new ways into the future through a forward thinking, agile and caring mindset. We excel at digital product engineering and deliver on our promise of thinking breakthroughs. Today, we are 10,000 experts across 26 countries, forming a Nation of Nagarrians, ready to help our customers succeed. www.nagarro.com