Success Story: Unu

Electric scooter reimagines personalized urban mobility

KDAB automotive-grade software expertise powers connected scooter

KDAB developed software that was optimized for embedded platforms but also expandable through user-device and cloud-service connectivity.

An effective micromobility solution can help a city meet its transportation goals, open more neighborhoods to greater diversity, and make the urban experience more enjoyable. This is exactly what unu had in mind when they created their first electric scooter.

Unu's expertise in batteries and mechanics made this scooter well received and very successful. However, unu wanted their next scooter to be fully connected. The founders knew that they weren't experts in all domains and would need help in some key areas. In order to design and develop their next scooter with a fully digital experience, they reached out to KDAB.

The many requirements of the unu project were familiar to the KDAB engineering team. Unu needed a

fast and fluid user interface that was instantly understandable to novice users. They wanted very rapid development to quickly prototype, test, and refine the hardware, software, and user interface. The software needed to be optimized for embedded platforms but also expandable through over-the-air connectivity. Unu planned on using the new software as a base for upcoming products, so they also needed a well-designed architecture that would be fully portable to new hardware and operating systems. And finally, since the product targeted many international markets, they needed custom integration with translation tools.

KDAB selected Qt as the framework for the project as it enables cross-platform development, easily integrates into many open

source software packages, and is optimizable for embedded hardware. KDAB engineers worked with the unu team to create an architecture that contained three primary human-machine interface (HMI) components. The first is an always-available driver status panel, showing critical information. The second is a flexible display that accommodates different applications. The third is a notification area for items that require the user's attention.

Guilherme Müller, unu's director of embedded engineering was impressed with KDAB engineers: "They were able to get onboard extremely fast and provide us with working prototypes almost from day zero. That was also very helpful during development when we had to scale our resource demands by adding KDAB engineers, who were productive within a day or two."

To make the speedometer fast and fluid, KDAB used the onboard GPU to render the meter with OpenGL shaders, fully offloading the processor while making it attractive.

The meter was animated using Qt's animation framework, providing smooth motion that mimicked an analog gauge. Changes were abstracted so that HMI designers could easily manipulate the controls while not worrying about the technical implementation.

The navigation application also required KDAB's expertise. Because the chosen engine did not have a Qt integration, KDAB engineers created a Qt Quick object to wrap navigation sessions so they could be easily manipulated in QML. This and other improvements made it easy to design the HMI but also importantly encapsulated the navigation and routing features in a modular way, making future changes isolated and easy.

Throughout this process unu found KDAB a pleasure to work with. "It's was amazing to see how KDAB's engineers seamlessly collaborated with unu's design and engineering teams," explains Mathieu Caudal, Co-founder and COO of unu. "The end result – a fully connected and digital mobility experience – is astonishing."

About the KDAB Group

The KDAB Group is the world's leading software consultancy for architecture, development and design of Qt, C++ and OpenGL applications across desktop, embedded and mobile platforms. KDAB is the biggest independent contributor to Qt. Our experts build run-times, mix native and web technologies, and solve hardware stack performance issues and porting problems for hundreds of customers, many among the Fortune 500. KDAB's tools and extensive experience in creating, debugging, profiling and porting complex applications help developers worldwide to deliver successful projects. KDAB's trainers, all full-time developers, provide market leading, hands-on, training for Qt, OpenGL and modern C++ in multiple languages. Founded in 1999, KDAB has offices throughout North America and Europe.