Case Study

aiMotive: ADAS & Autonomous Driving Simplified

Customer Background

"Our vision is a future where advanced driving assistance systems (ADAS) improve the lives of everyone, not just the owners of premium vehicles. A future where driving is not only more comfortable but also safer, with fewer accidents and injuries. For us, that begins with a collaborative approach to automotive software development."
Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

Headquartered in Budapest, a growing hub for automotive innovation, aiMotive is one of the world's largest independent automotive technology companies, with active projects all over the world. Its primary product, aiDrive, is an automated driving and ADAS software stack designed for easy integration by auto manufacturers. The company also offers an ecosystem connected to aiDrive, including a data processing platform, an advanced rendering and simulation tool, and neural processing hardware.

"The real value proposition of our company lies in our ecosystem. We provide software tailored to our partner's needs, without closing them into a technology stack or solution set. Traditionally, automotive software has largely consisted of prohibitively expensive black box software development kits (SDKs) — aiMotive's goal is to remove those barriers and challenge the old way of working."
Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

It was in the pursuit of an open and affordable approach to autonomous driving systems (ADS) and ADAS that brought aiMotive into a close partnership with QNX ®.

A Leading Driver of ADAS Innovation

aiMotive's product portfolio is intentionally designed to reduce cost, complexity, and time-to-market for developers. Alongside its core technologies, the company maintains reference software to help its clients better conceptualize their goals. It also regularly enters into joint development partnerships, opening up parts of its software stack as needed.

"We're very proud of serving our automotive customers essentially from Day One. One of our greatest recent achievements is the inclusion of aiDrive in the Sony Vision-S prototype. We also make a point of paying close attention to emerging trends — currently, one of the most significant to us is the move toward centralized ADAS, consolidated software queues, and auto-scaling hardware architecture."
Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

As the company prepared for these market shifts, aiMotive assessed the hardware platforms currently available to OEMs. Although it discovered significant variance in both cost and functionality, it also found that the majority of these platforms shared something in common: Namely, they were built on the QNX Real-Time Operating System (RTOS).

"QNX is the most prominent choice as a real-time operating system."
Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

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When it comes to safety and reliability, we have to choose QNX. There is no other alternative — no solution in the high-performance computing or embedded systems market that could meet our needs.

Krisztian Holman, aiDrive Lead Software Engineer, aiMotive

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Choosing the Best Road Forward

“The amount of development work required every time we need to move to a different hardware platform is immense. This was where we felt we had the most to gain with QNX. Not only is it a market leader, but it also supports the POSIX API, making it very easy for us to port between platforms.”
Gabor Pongracz, Senior Vice President, aiMotive’s aiDrive Division.

The microkernel architecture at the core of the RTOS was another major factor in aiMotive’s decision. One of the most significant challenges in designing embedded systems for vehicles involves adherence to ISO26262. Built with automotive safety in mind, QNX is fully ISO26262 ASIL D certified.

“In a vehicle, there are quite a lot of subsystems sharing the same hardware, and you have to ensure non-essential software cannot interfere with safety-critical software. QNX’s microkernel architecture plays a huge part in helping us accomplish that. It allows us to easily separate core functions from secondary functions.”
Krisztian Holman, aiDrive Lead Software Engineer, aiMotive.

Fast-Lane Deployment

Once aiMotive made the decision to port aiDrive from its existing platform to QNX, it prepared for what it expected would be a considerable undertaking. Instead, the process took only a few months with a small team of software engineers.

“When Krisztian’s team began porting aiDrive to QNX, we had this assumption that it would take a great deal of time and effort. I was really amazed at how fast they were able to achieve their goal. It’s rarely that simple with software tools in our industry.”
Gabor Pongracz, Senior Vice President, aiMotive’s aiDrive Division.

“We’re mainly on Linux, and because of QNX’s POSIX compatibility, we did not need to modify much lower-level, OS-related code, all we really needed to do was adapt our build infrastructure to support the QNX-specific compiler and libraries. It was a huge help for us and made it quite easy to port our application over.”
Krisztian Holman, aiDrive Lead Software Engineer, aiMotive.

QNX helps not just aiMotive, but I believe all automotive software companies. It will play a crucial role in taking the burden of complexity off the shoulders of developers, allowing them to create better and safer products while also significantly reducing time to market.

Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

Lightening the Load for Developers

Automotive software development tends to be incredibly challenging, particularly where sophisticated programming methodologies — such as are required for ADS and ADAS — come into play. The burden of getting a product quickly to market while adhering to industry standards and regulations is vast. And it's this burden which, through its partnership with QNX, aiMotive plans to reduce.

"Ultimately, we want to create a more open, collaborative development environment for both OEM and tier-one partners, QNX helps us achieve that goal. Not only does it create a basis for different kinds of reusable, multi-platform applications, it works according to automotive safety standards."
Gabor Pongracz, Senior Vice President, aiMotive's aiDrive Division.

Steering Toward the Future

aiMotive's long-term vision for ADAS is one which sees products and feature-sets continually evolve over time. It seeks to be part of that evolution, leveraging its data pipeline to gather and analyze data from entire fleets. To that end, it plans to continue working closely with valued partners such as QNX.

"We have a few hardware platforms currently on our roadmap, which we'll implement with QNX, the QNX development experience is quite similar to open source, which is a key advantage for our current and future plans. We seek to collaborate with everyone — we do not want to lock our partners into a technology stack or (closed) solutions, and QNX fully supports this approach."
Krisztian Holman, aiDrive Lead Software Engineer, aiMotive Division.

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About QNX

QNX, a division of QNX Limited, enhances the human experience and amplifies technology-driven industries, providing a trusted foundation for software-defined businesses to thrive. The business leads the way in delivering safe and secure operating systems, hypervisors, middleware, solutions, and development tools, along with support and services delivered by trusted embedded software experts. QNX® technology has been deployed in the world's most critical embedded systems, including more than 275 million vehicles on the road today. QNX® software is trusted across industries including automotive, medical devices, industrial controls, robotics, commercial vehicles, rail, and aerospace and defense. Founded in 1980, QNX is headquartered in Ottawa, Canada.

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