

NNG ensures software quality for in-vehicle infotainment and navigation systems with Coverity



Business Benefits

Better quality software in IVI systems and navigation devices for over 150 OEMs

By transforming its development processes and eliminating inefficient coding, NNG is improving the quality of its navigation software, which is used for in-vehicle infotainment systems and navigation devices by OEMs worldwide.

Faster innovation and time-to-market

By enabling its developers to work faster and smarter, NNG will be able to further reduce the time-to-market for new features and software products that it provides to its OEM customers.

Reduction of ongoing software maintenance costs

By removing and resolving issues with legacy code, NNG is able to significantly reduce ongoing software maintenance costs. This helps to provide higher quality software, even more cost effectively, to its customers.

Business Overview and Challenge

NNG's iGO Navigation software is at the heart of millions of products used every day in many countries across the globe. From in-vehicle systems and smartphones to games consoles and personal navigation devices, iGO Navigation solutions help people plan their journeys, find local points of interest and avoid traffic problems.

The company has sold millions of licenses to more than 150 business customers, including leading OEM (Original Equipment Manufacturers) such as Becker, Clarion, Alpine, Pioneer, Fujitsu Ten and Harman. Although NNG primarily sells to OEMs, the company has also launched a consumer application for the iPhone in 2009.

Based in Hungary, the company is currently experiencing considerable growth. Since its foundation in 2004, NNG has been a pioneer in navigation software, and was one of the first companies to provide turn-by-turn navigation solutions for China. To maintain its market leading status and reputation for innovation, NNG is constantly developing new functionalities for its products. Its flagship OEM solution, iGO primo, offers a range of advanced features, including Intuitive Navigation, connected features, Google local search, satellite and multi-media interfaces.

As well as constantly enhancing and refining software versions and functionalities, NNG's software engineers are experts at customizing the company's products to meet the needs of its OEM customers. As Zsolt Farkas, Software Development Expert at NNG, explains: "Although some customers buy our solutions 'off-the-shelf', others require extensive customization and integration efforts – particularly those serving the automotive sector, as navigation devices need to interoperate with other in-vehicle systems. We have developed our products so that every element can be configured and the user interface matched to different brands."

The quality of the software code is fundamental to the quality of the iGO Navigation product range, as Farkas explains: "Our solutions share around 80% of their code, so any defect will appear not in just one product line but in all of them. The remaining 20% represents client customizations, which can also have a massive impact on the overall performance of our software."

“We embedded Coverity Static Analysis in our development process so every new line of code is tested before it is released into the market,” explains Zsolt Farkas, Software Development Expert at NNG.

Although NNG is not subject to any specific quality thresholds set by its OEM customers, there is growing pressure in the navigation industry for suppliers to meet certain KPIs. “We are working with the navigation software community, our partners and academic groups to establish standards for navigation software that will deliver a better user experience,” comments Farkas. “With the exception of mission-critical applications, there is a huge vacuum in terms of certification and quality measurements for software development firms and their products. We want to change this so customers can make more informed choices.”

NNG also aims at lowering costs and complexity in its software development process. As Farkas explains: “To reduce the cost of maintaining our software, we need to go back to the original source code and make it more efficient. We have more than one million lines of legacy source code dating back nearly 10 years, so this is a massive undertaking.”

Solution Evaluation

As part of its efforts to drive continuous improvement and customer satisfaction, NNG embarked on a quality assurance program in May 2011. “Our ability to embrace development testing is a major factor in our quality program as we want to be able to deal with any code problems or inefficiencies as early as possible in the development process,” comments Farkas.

Because customer satisfaction, cost control and competitive advantage can all be impacted by the quality of software code, Coverity has become fundamental to NNG’s quality initiative to protect its brand reputation with its customers and supply chain partners. The company is constantly developing new functionality for its 28 products and equips its engineers with Coverity® Static Analysis to enhance its quality assurance program and create higher software standards for the navigation industry.

NNG benchmarked three solutions including Coverity Static Analysis. The key criteria included: the ability to track common defects across large number of projects (so that the same defect would not appear twice across multiple branches of code); the possibility to achieve full visibility of legacy source quality, and the facility to provide trackable metrics on legacy source code. Some of the key features that further differentiated Coverity; A highly usable and extendable web interface, the extendibility of the checkers, low false positive rates, good defect tracking and a very effective syntax parser.

The development team finally chose Coverity Static Analysis for its accuracy of results, its advanced extensibility to fit into the development workflow and its ability to track and manage defects between 28 projects and different code branches comprising over one million lines of code.

Coverity Deployment and Benefits Realized

NNG began its phased deployment of Coverity Static Analysis in early 2012. “The wide-scale deployment of Coverity is helping us to transform the way our development team works,” explains Farkas. “We don’t want to just look for bugs; we also want to identify certain code patterns and establish metrics for measuring our development processes.”

“Coverity development testing has brought greater consistency and control to our development activities, the results of which have been gains in productivity and software quality. NNG is also planning to extend Coverity to validate legacy code in future projects.”

Zsolt Farkas*Software Development Expert at NNG*

The initial deployment involved the company’s development team leaders and two of NNG’s 28 product lines, its flagship OEM product and iPhone application. The implementation was then further extended across the development organization. “We embedded Coverity Static Analysis in our development process so every new line of code is tested before it is released into the market,” explains Farkas, Software Development Expert at NNG. “Coverity development testing has brought greater consistency and control to our development activities, the results of which have been gains in productivity and software quality. We are now also examining the quality of our legacy code as we want to quantify any residual issues as these could impact both current and future products. So far Coverity Static Analysis has been used to evaluate around a million lines of legacy iGO code”.

Some of defects eliminated through development testing would, if left unchecked, have been serious. For example, Farkas and his team have been able to detect defects that have caused problems in graphics rendering. In addition to helping NNG locate defects hidden within its source code, Coverity also identified code patterns and established metrics for measuring NNG’s development processes.

“Coverity Static Analysis will enable us to enforce a certain type of coding that is beneficial both for NNG and its clients, the leading OEMs,” comments Farkas. “We will be able to eliminate inefficiencies in our code and optimize our processes, so the development team can work faster and smarter. This will help increase both customer satisfaction and competitive advantage.”

As a result of these improvements, NNG has been able to:

- Reduce maintenance costs for its software
- Reduce the testing effort for its customers
- Accelerate the development process for new products and customizations
- Establish standardized metrics for measuring software quality across its supply chain
- Remove cost and complexity from its own software development activities

Conclusions

Customer satisfaction, cost control and competitive advantage can all be impacted by the quality of software code. In keeping with its reputation for innovation, NNG has launched a quality assurance program that will not only transform its development activities for years to come but also facilitate the creation of software standards for the navigation industry.

By driving quality in its navigation software products, NNG is able to protect the brand reputation of both its own company and that of its supply chain partners. Development testing from Coverity not only helps ensure the quality of software, but also influences accelerated time-to-market and enhanced developer productivity, all of which contribute to competitive advantage.

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