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BLACKBERRY RECEIVES THE 2023

COMPANY OF THE YEAR AWARD

Identified as best in class in the global automotive embedded operating system industry

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Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each Award category before determining the final Award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. BlackBerry excels in many of the criteria in the automotive embedded operating system space.

AWARD CRITERIA

Visionary Innovation & Performance	Customer Impact
Addressing Unmet Needs	Price/Performance Value
Visionary Scenarios Through Mega Trends	Customer Purchase Experience
Implementation of Best Practices	Customer Ownership Experience
Leadership Focus	Customer Service Experience
Financial Performance	Brand Equity

Robust Embedded Solutions

As the automotive industry undergoes significant technological advancements, market participants face substantial challenges in integrating these solutions and providing an outstanding customer experience. Specifically, embedded operating systems (OS) must isolate critical functions efficiently to facilitate day-to-day operations for software-defined vehicles, connected mobility, and autonomous vehicles. While standardized hardware provides baseline capabilities in the automotive space, original equipment manufacturers (OEM) and Tier 1 suppliers continue to differentiate their vehicles through embedded software. Embedded OSs that isolate critical functionalities enable OEMs to add, remove, and change software capabilities modularly, delivering better customer experiences and vehicle performance. Organizing and managing various software applications into one standardized and agnostic platform is necessary to ensure seamless implementation. Frost & Sullivan points out that connected technologies also bring an added layer of security threats; as such, solutions that integrate robust cybersecurity protection from the beginning are vital to ensuring security and reliable performance. Finally, the complexity of autonomous, connected, and electric vehicles is driving even more regulatory and safety requirements that must be considered and embraced by embedded platform developers.

Founded in 1980 and headquartered in Ottawa, Canada, BlackBerry develops embedded solutions, including OSs, hypervisors, software, and development tools as part of its QNX product line. Its systems are deployed globally and have broad applications in automotive, commercial vehicles, heavy machinery, industrial controls, medical, aerospace and defense, and rail and robotics. Backed by experts who provide

continuous support, Frost & Sullivan analysts observe how the company's safety-certified solutions clearly accelerate clients' strategic initiatives and boost their development efforts.

BlackBerry QNX: Delivering Safety, Security, and Reliability

BlackBerry's vision centers on enabling the development of improved embedded solutions to deliver safety, security, scalability, and reliability. The company has identified and validated broader market trends driving powerful embedded systems' growth through industry research and customer engagements.

Across industry verticals, BlackBerry is capitalizing on the increase in the adoption of software-defined vehicles. An emerging trend toward module consolidation also results in a demand for mixed-criticality systems. As OEMs integrate even more technologies with greater functionalities within a single module, they require high-performance computing solutions. The growing demand for cloud and edge solutions also requires intelligence blending technologies. BlackBerry properly recognizes that with the growth of these technologies, there is also an increased demand for safety and security to align with security requirements and regulations.

> *"The company's top priorities are to deliver improved certification and safety on a high-performance computing platform that enables cloud connectivity and connected services. Its solution suite is domain agnostic, providing a standardized platform with broad applications across various use cases. In addition, the company's technologies bridge the gap between disparate systems that are traditionally siloed, enabling cohesion and ensuring a seamless experience."*
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> **- Manish Menon**
> **Autonomous & Connected Vehicles, Global Program Manager**

Through its continuous trend monitoring, Frost & Sullivan appreciates how BlackBerry offers one of the most comprehensive embedded connected and autonomous vehicle solutions. The company's top priorities are to deliver improved certification and safety on a high-performance computing platform that enables cloud connectivity and connected services. Its solution suite is domain agnostic, providing a standardized platform with broad applications across various use cases. In addition, the company's technologies bridge the gap between disparate systems that are traditionally siloed, enabling cohesion and ensuring a seamless experience. Certification, safety, domain agnosticism, and cohesion are the company's key value propositions, solidifying its leadership position.

The BlackBerry QNX product portfolio includes:

QNX Neutrino Real-time Operating System (RTOS) 7.1: The core of QNX technology with full RTOS features that enable the development of mission-critical embedded systems in the cloud. With microkernel architecture that isolates each component (e.g., applications, drivers, and protocol stacks), failed components minimally impact performance, ensuring system reliability. Clients can also add new drivers and hardware with confidence and no risk of system failure; at the same time, a self-monitoring high-availability manager performs multistage recovery if system services or processes fail. These microkernel capabilities provide safety certification for QNX OS for Safety. These established certifications reduce or eliminate clients' efforts towards meeting safety requirements, for cost savings and faster time-to-market. The QNX Neutrino RTOS supports asymmetric and symmetric multiprocessing and bound

multiprocessing. With adaptive partitioning, critical processes can access unused cycles for added power. The system's layered and granular security also allows for robust threat mitigation and hardened systems.

QNX Hypervisor Virtualization Software: Enables the consolidation of various embedded systems and their respective reliability and security requirements on a single system on a chip (SoC). The virtualization software provides the sharing and abstraction of underlying hardware to combine functions in the hypervisor environment, enabling digital cockpits, domain controllers, and advanced medical and industrial controllers. Clients can run services on preferred OSs (e.g., Android and Linux) to develop desired features with minimal power consumption and costs.

BlackBerry QNX's Software Development Platform (SDP): A POSIX-compliant and Linux-like development platform for critical embedded systems. The microkernel RTOS includes QNX Neutrino RTOS, QNX Momentics Tool Suite, and QNX Software Center.

With its robust solution suite, BlackBerry poises itself to address the emerging trends, delivering safety-certified and secure foundational embedded software, including digital cockpits, advanced driver assistance systems (ADAS), vehicle-to-everything, instrument clusters, high-performance controllers, infotainment, acoustics, secure gateways, over-the-air software updates, and telematics. The company's comprehensive portfolio is a one-stop-shop, enabling innovation and delivering safety, security, scalability, and reliability.

With a legacy of market leadership, the company's compelling value proposition underpins its sustained success. Focusing on the processes, software development, and methodology ensures it continues to provide certification and functional safety of its solutions. Safety certification of its solutions is a primary differentiator for the company. While other competitors release their safety-certified OSs, hypervisors, and tools with full capabilities like application programming interfaces (API), their commercially released non-safety-certified solutions are vastly different and do not include all functionalities. However, BlackBerry's QNX further distinguishes itself by providing a complete platform of common tools, APIs, software, and kernels across its safety and non-safety solutions.

BlackBerry's QNX product line holds safety certifications, including International Organization for Standardization (ISO) 26262 Automotive Safety Integrity Level D for functional safety, the highest standardization level for safety-critical function operations. The company also holds International Electrotechnical Commission (IEC) 61508 (industrial) and European Standards (EN) 50128 (rail) for functional safety, IEC 62304 for medical device software life cycle requirements, EN 50657 for the process and technical requirements for the development of software for electronic systems for rail vehicles, ISO 21434 an automotive cybersecurity standard, and ISO 15408 a common product security standard. BlackBerry's QNX drives value further with its pre-certified OS and hypervisor solutions that reduce the complexity, cost, and development risk and ensure clients meet production deadlines.

BlackBerry's QNX suite brings clients peace of mind, establishing trust with its reliable, safety certified, and efficient solutions. With this leadership focus, Frost & Sullivan expects BlackBerry to sustain its dominance in the automotive embedded operating system space.

A Customer-centric Approach Driving Unmatched Client Experience

BlackBerry's QNX embedded vehicle platform goes beyond its extensive expertise and best-in-class capabilities, with customer value as a strategic imperative. Through the years, the company has earned a sterling reputation, supporting clients' path towards developing and launching safe, secure, and reliable systems.

BlackBerry's dedicated team of experienced kernel developers, engineers, and architects provides clients with a broad knowledge base, supporting their development efforts. Clients also have access to its technical support experts through an online portal, help lines, Foundry27 (a community portal with repositories, forums, blogs, wikis, and code sharing), and its knowledge base with tips and technical articles.

The company also offers customized professional services to supplement clients' teams, help jumpstart new projects, improve cybersecurity, or aid in safety certifying solutions. BlackBerry's professional services include its comprehensive security support, including open-source software assessment, security audits, and penetration testing. To help clients build their expertise, the company has training and education services with custom courses, workshops, software assessments, and in-person training at QNX University or clients' locations.

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>
> *- Elizabeth Whynott*
> *Best Practices Research Analyst*

Unlike competitors, BlackBerry builds its solutions by collaborating closely with various stakeholders and partners to evolve alongside market needs and trends. Its development efforts are primarily customer-driven, continuously gathering feedback to guide its product roadmap. The company also invests heavily in its safety and security portfolio, offering the most up-to-date technologies and expanding its solutions.

BlackBerry's engaging and seamless approach and close relationships position it as a preferred vendor for embedded connected and autonomous vehicle solutions.

A Promising Outlook for 2023 and Beyond

Since its inception, BlackBerry's sterling reputation and customer-centric framework led to its coveted preferred partner status. Over the years, it added a range of new clients to its established base. Forty-five automakers have already embedded the company's solutions in over 290 vehicle models and more than 235 million vehicles.

The company has an extensive network with globally recognized clients, from large OEMs and Tier 1 suppliers to start-up EV manufacturers. It provides platform enablement, middleware, certified foundations, virtualization, OSs, tools, and professional services to industry leaders, with nine of the top 10 OEMs and seven of the top seven Tier 1 suppliers choosing BlackBerry's QNX technology. Some of the company's top OEM clients include BMW, Daimler, Fiat Chrysler, Ford, Toyota, Audi, Porsche, Lexus, Chevrolet, GM, and Volkswagen; its Tier 1 supplier clients include Aptiv, Bosch, Denos, and Panasonic, as

well as silicon partners Intel, Nvidia, and Texas Instruments.

BlackBerry's QNX solutions are also trusted by various industry leaders in aerospace and defense (e.g., L3Harris, Lockheed Martin, and Thales), industrial controls (e.g., AECL EACL, GE, and Honeywell), medical (e.g., Medtronic, Omron, and Siemens), and rail and robotics (e.g., GE Transportation and duagon).[1]

BlackBerry continues to solidify its reputation by delivering 100% success in safety and security certification across various markets. The company's strong customer focus to ensure reliable solutions help build trusting relationships and attract new clients.

Continuous Enhancement

BlackBerry recognizes that clients desire low-risk embedded solutions - yet still want to offer innovative services for their end-users. The company incorporates this understanding, offering a robust portfolio enabling clients to build differentiated solutions, enhancing both customer value and satisfaction. It provides its suite of technologies and services, including its OSs, expertise, engineering services, and safety and non-safety critical services. Additionally, the company's extensive portfolio and development tools allow clients to focus engineering resources on areas where they can offer more value and personalization to customers, providing cost savings and a monetization path.

In the coming months, BlackBerry is releasing its most performant OS, QNX Software SDP 8.0. Outfitted with advanced QNX 8 Microkernel, the platform is built for high performance, one-to-one core scalability, low latency, and safety certification. The QNX SDP 8.0 includes the new QNX Toolkit for Microsoft Visual Studio Code and serves as the baseline for OS for the next generation of the QNX Hypervisor, QNX OS for Safety, and QNX Hypervisor for Safety products.

BlackBerry's QNX solution suite is easily accessible in the cloud. QNX SDP 7.1, QNX OS for Safety, and Hypervisor are available on Amazon Web Services Marketplace and will soon be available on Microsoft's Azure Marketplace; when released, QNX SDP 8.0 will also be available in these marketplaces. Additionally, the company offers graphics, audio, and input support and virtual representations of instrument clusters, cockpits, ADAS systems, and more on the cloud.

BlackBerry's QNX portfolio provides OEMs and Tier 1 suppliers with reliable solutions by consolidating various embedded systems and their respective safety and cybersecurity certification requirements on a single SoC. Its standardized and agnostic platform ensures seamless integration of various applications, boosting development efforts of desired features with minimal power consumption, easy scalability, and lower costs. With its compelling value proposition, BlackBerry is well-positioned to drive the embedded operating system in the automotive space into its next growth phase, capturing market share and sustaining its leadership in the coming years.

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[1] https://blackberry.qnx.com/en/company.

Conclusion

Integrating embedded connected and autonomous vehicle solutions presents significant challenges to automotive original equipment manufacturers (OEM). OEMs and Tier 1 suppliers aim to differentiate their vehicles through various software applications requiring a standardized and agnostic platform for seamless performance. Additionally, connected technologies require robust cybersecurity protection and alignment with new regulatory and safety requirements. Overall, with its QNX product line, BlackBerry addresses these challenges with a strong leadership focus that incorporates client-centric strategies and exemplifies best practice implementation.

BlackBerry's vision centers on enabling the development of improved embedded solutions to deliver safety, security, scalability, and reliability. The company offers one of the most comprehensive and high-performing embedded connected and autonomous vehicle solutions. Its solutions are pre-certified for safety and domain agnostic, providing a standardized platform with broad applications across various use cases - including advanced driver assistance systems, vehicle-to-everything, infotainment, acoustics, secure gateways, and more. BlackBerry also provides a suite of services, including engineering services and safety and non-safety critical services. The company remains a trusted partner, earning a reputation for offering the best in the automotive embedded operating system market.

With its strong overall performance, BlackBerry earns the 2023 Frost & Sullivan Global Company of the Year Award in the automotive embedded operating system.

What You Need to Know about the Company of the Year Recognition

Frost & Sullivan's Company of the Year Award is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Award Analysis

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Visionary Innovation & Performance

Addressing Unmet Needs: Customers' unmet or under-served needs are unearthed and addressed by a robust solution development process

Visionary Scenarios Through Mega Trends: Long-range, macro-level scenarios are incorporated into the innovation strategy through the use of Mega Trends, thereby enabling first-to-market solutions and new growth opportunities

Leadership Focus: Company focuses on building a leadership position in core markets and on creating stiff barriers to entry for new competitors

Best Practices Implementation: Best-in-class implementation is characterized by processes, tools, or activities that generate a consistent and repeatable level of success

Financial Performance: Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

Learn more.

Key Impacts:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**