KPIT Technologies Recognized for

2021

Technology Innovation Leadership

Global Over-The-Air (OTA)
and Cloud Platform Industry
Excellence in Best Practices

FROST *&* SULLIVAN

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. KPIT excels in many of the criteria in the automotive over-the-air (OTA) and cloud platform space.

AWARD CRITERIA

Technology Leverage	Business Impact
Commitment to Innovation	Financial Performance
Commitment to Creativity	Customer Acquisition
Stage Gate Efficiency	Operational Efficiency
Commercialization Success	Growth Potential
Application Diversity	Human Capital

Software updates are increasingly critical for new-age vehicles with highly-enabled connected technologies. Software update functionalities allow manufacturers to eliminate security vulnerabilities and promptly respond to software cyberattacks. OEMs use over the air (OTA) technology to mitigate software recall expenses by rolling out updates for in-vehicle software to maintain post-sale vehicle performance and feature enhancements and increase customer convenience. Frost & Sullivan predicts that over 20% of cars globally will have OTA functionality by 2025. Therefore, ensuring seamless execution of the OTA process, including safe software deployment without malicious code, is critical. While OTA implementation is costly, it plays an inclusive part in the lifecycle of connected or autonomous vehicles. Tesla is ahead of the curve, disrupting the automotive industry by offering OTA security updates with its software architecture, successfully enabling autopilot using firmware OTA updates.

Frost & Sullivan observes how OEMs and Tier-1 suppliers are investing in technology companies to focus on OTA updates to manage security needs and proactively fix in-vehicle errors on the go. Companies leverage new-age technologies to update in-vehicle software dynamically and gain a competitive advantage in the connected car security space. Technology companies that enable OEMs to keep pace with current OTA leaders will be favorable as OTA providers allow OEMs to address software fixes, anticipate cybersecurity issues, and add new functionalities. Frost & Sullivan believes that OEMs should

continue striving to maintain a relationship with the vehicle owner during the entire ownership period instead of just at the moment of purchase.

With technology centers of excellence in Munich (Germany), Pune & Bangalore (India), Novi (United States), KPIT is driven by its vision to create technologies that "reimagine mobility" for next-generation software-driven vehicles and empower OEMs to handle two-way connectivity on their own. With vehicles becoming more connected and the number of code lines exceeding 100 million per vehicle, KPIT's in-vehicle OTA software update solution seamlessly updates new software, resolves software malfunctions at every stage of software development and deployment, and detects deviations in software behavior. Providing professional quality solutions to OEMs and Tier 1 companies, KPIT delivers industry-standard OTA platform and data management solutions and consistently expands its portfolio to meet the high-quality requirements of the automotive industry. To date, KPIT has successfully implemented its OTA solution in over 5 million vehicles, while 11 million vehicles globally are under contract.

Enabling the Future of the Automotive Industry

The vehicle industry is moving away from the traditional paradigm, where a customer buys a vehicle and has little to no direct contact with the manufacturer until it is time to buy a new one three to five years later. Today, OEMs continuously release new features to ensure the owner gets the most out of their vehicle and is safe throughout its lifespan. Software development sits at the center of this new paradigm, as OEMs move away from year-long production cycles without the ability to update the software in vehicles on the road retroactively to an agile process to continue software development and deployment.

> *"KPIT successfully leverages its experienced and dedicated engineering team in building a scalable OTA solution. Frost & Sullivan notes that the platform covers the entire software development cycle—from development to deployment—and detects potential faults in the software even when the vehicle is on the road."*
>
> *– Anubhav Grover, Research Analyst*

KPIT's OTA solution platform consists of the following variables:

- OTA solution readiness to support multiple ECU platforms and operating systems
- Multi-ECU updates programming
- Rapidly customizable OEM-specific packaging format
- Quick adoption of different ECU S/W architecture
- Updates to the security framework

KPIT successfully leverages its experienced and dedicated engineering team to build a scalable OTA solution. The company's OTA and cloud platform solution covers architecture consulting, OTA software integration, cloud platform customization and integration, campaign and dependency management, and end-to-end OTA testing. Frost & Sullivan notes that KPIT's platform is one of the few providers that cover the entire software development cycle—from development to deployment—and detects potential faults in the software even when the vehicle is on the road. As a result, the platform can predict possible downtime events ensuring that the software will run as intended while safeguarding against malicious

software entering the vehicle. The platform enables OEMs to correct previous software updates without the user noticing any downtime in vehicle performance.

KPIT demonstrates best practices by strategically collaborating with industry partners to address industry gaps and ensure the development of new solutions to explore new opportunities. For instance, in 2021, it collaborated with ZF Group to develop a middleware solution for the automotive ecosystem. KPIT's acquisition of a controlling stake in PathPartner Technology in June 2021 has strengthened its software integration capabilities. The acquisition bringing together PathPartner's competence in operating system software and its existing semiconductor partnerships will be key in delivering software solutions for new-age vehicle architectures. In September 2021, KPIT acquired a 25% stake in Germany-based Future Mobility and expects to acquire the remaining stake by FY2024. Future Mobility is engaged in software and feature development in the autonomous driving domain. The partnership will help with new offerings and bolster KPIT's market presence in Germany. Over the last 15 years, KPIT has partnered with or acquired technology companies worldwide, building competence and scale that has become valuable for offering holistic solutions. Frost & Sullivan believes KPIT's approach of collaborating with industry players is a strong business model for enabling the company to enter and capture key targeted market segments.

Insight-based Innovation

KPIT has forged its 20 years of domain expertise in automotive software engineering to develop production-ready full-vehicle OTA software solutions and services. The company's understanding of vehicle software architecture and discussions with OEMs have allowed it to establish an innovation process and ensure its solution tailors to OEM needs and provides a robust, secure, and efficient platform. The company's software solution is scalable and geared toward high-volume uses. Approximately 8 million ECUs across various domains have successfully flashed with KPIT OTA components. By addressing industry needs, such as managing OTAs, backend services, variants, and software version dependencies, Frost & Sullivan recognizes KPIT's success in helping OEMs build a competitive advantage in keeping pace with market leaders.

> *"The company attributes its success to the strong demand for its OTA solutions and services. KPIT has made substantial gains so far, in terms of order intake from players in the automotive ecosystem. Currently, KPIT works with more than 25 OEMs/Tier 1 suppliers as strategic partners."*
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The company provides a clear roadmap to integrate the solution as part of the OEMs' ecosystem. To do this, the OTA provider needs to deliver a solution that is not only superior to other solutions available on the market, but also offers an upside so significant that it is worth OEMs' time and resources to implement the solution. KPIT delivers on this promise with its comprehensive range of OTA software solutions and services.

The company attributes its success to the strong demand for its OTA solutions and services. KPIT has made substantial gains in terms of order intake from players in the automotive ecosystem. Currently, KPIT works with more than 25 OEMs/Tier 1 suppliers as strategic partners, including OEMs from North America, the United Kingdom, Germany, Italy, and a commercial vehicle manufacturer from India. In the

long term, KPIT envisions itself as a key enabler for OEMs to comply with ever-increasing regulatory specifications for safety and security in the automotive industry. Continuous updates will be a crucial part of vehicle manufacturers' long-term customer retention strategy, requiring them to secure a partnership with a reliable software integrator like KPIT to bring in scale and dependability to accelerate from prototype to production of new-age vehicles. Frost & Sullivan finds that with the solid demand and widening adoption of OTA solutions among OEMs and Tier I suppliers, KPIT's robust revenue and earnings signal a positive long-term outlook**.**

Conclusion

Vehicle manufacturers are exploring new ways to utilize OTA updates to increase vehicle performance, safeguard vehicles against cyberattacks, and build long-term personalized relationships with the client, ensuring that safe and seamless OTAs are fundamental for manufacturers. The KPIT platform covers the entire software development cycle from development to deployment, enabling manufacturers to engage in an agile process to address the ever-changing conditions of the automotive industry. Its OTA platform solution aims to accelerate vehicle time-to-market and minimize the risk of major recalls for OEMs by proactively responding to future vehicle software architectures, processes, and services. Frost & Sullivan concludes that KPIT is uniquely positioned to ensure full vehicle level updates and provide integration services across the development lifecycle. With its strong overall performance, KPIT earns Frost & Sullivan's 2021 Global Technology Innovation Leadership Award in the Over-The-Air (OTA) and Cloud Platform industry.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

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

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

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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™.
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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)