

FROST & SULLIVAN

AWS

2022
COMPANY
OF THE
YEAR

GLOBAL
AUTOMOTIVE CLOUD
SERVICE PLATFORM INDUSTRY

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. AWS excels in many of the criteria in the automotive cloud service platform space.

AWARD CRITERIA	
<i>Visionary Innovation & Performance</i>	<i>Customer Impact</i>
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

Software-defined Vehicles to Address the Unmet Need of Unlocking Safety, Security, and Functionality

With more connected cars evolving over the years into semi/fully autonomous vehicles, the need for a complex architecture will gear up software-defined vehicles because of its ability to update software regularly over the air, thus creating an ecosystem that supports the development of today’s vehicles,

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- Gautham Hegde, Mobility Senior Research Analyst

along with the upgrades needed for the future. Original equipment manufacturers (OEMs) see software-defined vehicles as an opportunity to add significant value to the life of the vehicle and as an opportunity for continuous revenue generation through on-demand services. When OEMs create a vehicle, significant software development is conducted in simulation to reduce time, increase quality, and decrease development costs. A car cloud platform provides OEMs with the same environment parity to develop services/solutions, without the need to conduct extra field testing to prove the product capabilities.

The data from the connected vehicle is an important asset for any car manufacturer or Tier I supplier and should not be compromised at any stage of product development. If all the data is pulled from the vehicle, the customer/OEM collects more data than required, eventually affecting the value proposition.

Amazon Web Services (AWS) developed AWS IoT FleetWise to collect the required vehicle data in real time, transform the data, and then transfer the data to the cloud for building services/solutions more efficiently to improve vehicle quality, safety, and autonomy, as requested by OEMs/customers. AWS's software-defined vehicle solution includes services that are specific to the automotive domain that allow OEMs/customers to leverage data and drive value through the entire ecosystem. Through its vast industry experience, AWS has gained extensive partners and developers to build services/solutions based on customers' requirements.

Industry Challenges

Auto companies need consolidated demand for analytics, data, and simulation to improve efficiency in every stage of automotive production and to develop new and innovative services/solutions. Infrastructure, therefore, must be safe, secure, and reliable. Cloud computing is the most efficient way of handling such complex infrastructure.

Cloud computing can enhance connected car features and reduce the risk of data getting wiped out or experiencing a security breach at the server end. With auto companies looking for a more powerful data processing system at a lower cost, cloud servers could be the obvious choice for the better, safer, and faster processing of automotive data. Cloud providers, such as AWS, invest billions of dollars in this market to keep their solutions safe and to offer top-notch security features. The mobility industry is

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swiftly moving toward vehicle electrification and autonomous driving technology, with OEMs looking for newer revenue opportunities. Cloud, therefore, is apparently the only option that can act as a catalyst for these OEMs to adopt advanced technologies with lower operating costs.

AWS's primary focus has always been on the IT infrastructure part of business; however, the company's venture into the automotive industry has been challenging. Knowledge in the line of business in the automotive domain has been AWS's main challenge, including manufacturing, supply chain,

autonomous vehicles, and connected car technologies. AWS's top priority at the initial stage was to hire the right resources with knowledge in the line of business that relates to the automotive industry; therefore, AWS hired designated leaders to drive multiple lines of business in the automotive domain. These leaders receive input from customers or the internal team on problems that need to be addressed.

AWS's Partnerships with Leading Companies and Its Future Growth Opportunities

Despite being the market leader, AWS invests more in the automotive cloud service platform because of the growing demand for connected cars, along with more software development and over-the-air updates required for software-defined vehicles. AWS recognizes the need for more software-defined vehicles and wants to introduce open architecture for the automotive industry.

AWS has helped Continental Automotive build its software development tool chain called Continental Automotive Edge (CAEdge), a modular multi-tenant hardware and software framework that connects the vehicle to the cloud. In 2021, Continental Automotive partnered with AWS to speed up the development process and to meet security and compliance requirements for CAEdge. AWS and ARM Technologies are creating a consortium for an open standard-based architecture for software-defined vehicles. Open software architecture will be helpful in software development, with simulation taking place in the cloud. Other cloud providers can use AWS-ARM architecture, thus accelerating the software-defined future of the automotive industry.

AWS and Blackberry has built an intelligent vehicle data platform called Blackberry IVY. With Blackberry IVY, OEMs have the flexibility to extract the vehicle data, irrespective of the operating system. The strategic difference between Blackberry IVY and competing solutions is that Blackberry has a developer community that can create the needed ecosystem to allow third-party companies to support OEMs/Tier I suppliers in software development. The quality of the software developed at the cloud side should meet OEMs' requirements before being pushed to the vehicle, which is handled at the backend.

AWS considers itself as an enabler and has adopted three ways of approaching customers. First, AWS has created hundreds of services/solutions for software-driven vehicles, connected mobility, and autonomous mobility, as requested by customers, and enables OEMs to create these services/solutions on their own. Electric vehicle (EV) startup companies that are created in the cloud have a better understanding of AWS's cloud services/solutions; therefore, AWS does not need to invest significantly on training customers to use the services/products effectively. Second, AWS can build services/solutions with customers from scratch. AWS has all the tools to develop services in any line of business, even in tech companies, such as Sony, or any other automakers that are interested in building autonomous vehicles or digital cockpits. Third, AWS provides customers with a combination of flexibility and hybrid methodology, wherein it can help customers build products when they lack the expertise or build products on their own with a modular approach.

AWS sees huge potential in terms of revenue generation and is making large investments and looking for billions of dollars in expected revenue for cloud providers. The company has a customer-centric approach that allows it to succeed in the automotive cloud service domain. In addition, 90% of AWS's services/solutions are finalized from voice of the customer, and AWS believes that this focus will facilitate future growth opportunities, providing it with a competitive edge.

Customer-centric Strategies to Build a Positive Brand Reputation

AWS has incorporated certain industry practices within its organization to perform consistently and maintain its market success. Automotive is a guarded industry; therefore, AWS educates/trains its resources on security and privacy concerns in the automotive industry, to maintain trust between the

company and end users. Moreover, automotive is a buyer/builder-driven market; therefore, AWS understands where its customers/OEMs want to be in the next few years, such as portraying themselves as buyers or partners or recreating/building products by themselves.

AWS obtains customer feedback and develops solutions based on the knowledge of lines of business in the automotive industry. As a cloud service provider, AWS has an enormous responsibility to secure the confidential data shared by customers. The company allots dedicated resources for the automotive domain to understand customers' requirements and to maintain discipline, confidentiality, and customer trust.

AWS's methodology of working backwards with its customers allows it to offer top-notch services/solutions in the automotive cloud-based service platform space. Customers appreciate AWS's level of execution and commitment toward its projects, allowing AWS to handle projects that transform its entire ecosystem over other lines of business, thus adding value to its deals.

AWS determines pricing based on the number of services consumed. Each service has its own pricing that is worked out with the customer, such as service based on storage, compute, or database, along with the consumption of these services. AWS, therefore, follows a user-based pricing model. For example, in the case of compute, price is determined based on how many seconds of compute time was used and how many services were used.

AWS has earned good customer credibility in the market based on its expertise and on its excellence in building products that cater to customers' requirements or by delivering results beyond customers' expectations. AWS provides OEMs with flexibility, in terms of building products by either adding or enhancing the features of a particular product. Moreover, references from clients allow AWS to broaden its partnerships with other participants in the automotive industry.

AWS conducts briefings for customers every 3 to 6 months on its new products, and in return, it provides customers with the entire product ecosystem. AWS assigns a dedicated contact person, or customer success manager, to track the deliverables promised at the right time. In addition to ensuring on-time product delivery, the customer success manager helps AWS maintain cordial relationships with customers and receive good word of mouth in the automotive industry.

Conclusion

Extensive industry expertise in cloud computing allows AWS to develop solutions that meet the increasing demand in the automotive industry. As a result of more autonomous vehicle development, large amounts of vehicle data need to be processed for future advanced vehicle capabilities.

AWS can handle the entire ecosystem of a particular OEM/customer and can successfully provide high-value solutions with a competitive edge over other cloud providers in the automotive domain. Furthermore, the company's partnerships with global automakers, coupled with its constant expansion strategies, contribute to its future growth opportunities in the automotive space.

With its strong overall performance, AWS earns Frost & Sullivan's 2022 Global Company of the Year Award in the automotive cloud service platform industry.

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™.

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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)**

