



2018 United States Automotive Software Customization
New Product Innovation Award



2018
BEST PRACTICES
AWARDS

Contents

<i>Background and Company Performance</i>	3
Industry Challenges	3
Conclusion	8
<i>Significance of New Product Innovation</i>	9
<i>Understanding New Product Innovation</i>	9
Key Benchmarking Criteria	10
New Product Attributes	10
Customer Impact	10
<i>Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices</i>	11
<i>The Intersection between 360-Degree Research and Best Practices Awards</i>	12
Research Methodology	12
<i>About Frost & Sullivan</i>	12

Background and Company Performance

Industry Challenges

Every year, original equipment manufacturers (OEMs) design, produce, and sell slightly more capable vehicles than before. The emergence of reverse cameras, assisted parking sensors, lane shift warnings, and sophisticated infotainment systems has taken place in parallel with far more rapid innovation in the consumer technology market. Due to this slow pace of automotive technology evolution, not every vehicle is as optimized as its owner or driver may want. There are opportunities to 1) enable generic, mass-produced vehicles to deliver customized driving experiences; 2) make vehicles more fuel efficient given the specific conditions in which they operate; 3) make the vehicle experience safer by shifting the responsibility for safe driving out of the hands of the driver and into the control systems of the vehicle itself. These opportunities not only apply to the vehicles with the latest technological advancements installed at the factory, but also can apply to vehicles that have long been on the road with the very same technology and functionality from the year they were built.

When an OEM designs a vehicle - be it a car, truck, or van - it determines the widest set of conditions under which the vehicle might possibly be operated and programs the computers that control the vehicle accordingly. This “lowest common denominator” approach results in vehicles that can be driven nearly anywhere, but are not optimized for any specific conditions they are driven under. Two customers may buy the same truck with the same settings, but one uses it to commute in traffic and the other uses it to tow heavy loads on the open highway. For years, customers have only had limited options to determine the vehicle fit for them, for example factory-provided engine size or horsepower, but have not been able to enjoy any customization or feature additions beyond that initial selection provided by the OEM.

Another challenge that vehicle owners face is fuel consumption, an especially concerning factor for fleet vehicles such as delivery vehicles and emergency response vehicles that spend a large proportion of their operation in idle. Idling consumes between 0.8L and 2L of fuel per hour, depending on the size of the engine, which equates to over \$1,500 per vehicle per year. This wasted consumption also accounts for an enormous aggregated environmental impact when the number of fleet and service vehicles in the global automotive market is considered. These costs and environmental impacts can be greatly reduced, but require active upgrades to the way the engine consumes fuel during idling, which is managed through the vehicle’s digital operating system.

Safe driving comes in many forms, including observing posted speed limits, accelerating conservatively, and avoiding distractions while behind the wheel. Cell phone use, by drivers for sending text messages, taking calls, and even reading email or searching the Internet, is a major distraction for drivers and a safety concern for anyone in or near moving vehicles. Despite recent and increasing regulation prohibiting drivers’ use of cell phones while operating a vehicle, distracted driving is the primary cause of over 1,000 injuries and 9 deaths each day in the United States, according to the National Highway Traffic Safety

Administration (NHTSA). To reduce this shocking volume of accidents related to distracted drivers and improve road safety, all vehicles must be integrated with technology that actively-prevents unsafe driving habits.

According to NHTSA, teenagers (aged 15 to 19) are recognized as the most distracted drivers on the road, with over 9% of this population involved in fatal driving accidents. Among this count, over 20% of the young drivers were using their cell phone just before the accident. Original equipment manufacturers (OEMs) and technology developers are under pressure to solve this issue, not only to make younger drivers more aware of road safety, but more importantly to reduce accidents caused by distracted driving in the United States by 7 to 8%. Despite this pressure, little action has been taken to actively lower the rate of distracted driving related incidents by either party.

One way to improve road-related safety is by providing applications (apps) that combine software upgrades and hardware add-ons that deliver active safety features such as blind spot detection and autonomous braking. In fact, OEMs are adopting autonomous emergency braking and lane assist in their newer vehicles as a step towards achieving an autonomous future. Specifically, third-party software and apps can be integrated with a vehicle's sensor architecture to improve safety. Yet each OEM has its own hardware/software architecture, which makes third-party technology integration not easily adaptable across multiple OEMs. Despite OEMs working in tandem with various tech companies to provide safety features in their models, most are not universal products and cannot be added to older vehicles already on the road, nor are they applied to a significant proportion of new vehicles sold each year. Niche safety features remain limited to a small proportion of the vehicles sold and operated today. This is a significant detriment to improving road safety but one that can be overcome through use of aftermarket hardware and software updates that apply to existing and future vehicles alike.

New Product Attributes and Customer Impact

Derive Systems is a leading automotive technology company founded in 2003, with over 2 million software installations on the road today. Derive technology writes directly to the vehicle's engine and other control modules, integrating third party software, data, and sensors, to ensure that each vehicle performs intelligently and specifically to unique requirements, preferences, and conditions. These upgrades optimize the vehicle and driving experience, from increasing fuel efficiency to improving safety and adding intelligence by integrating multiple external data sources. What makes this different from a traditional telematics solution is the delivery of active optimizations automatically, in real-time, from the vehicle itself, not from data analyzed after the fact or passively relying on driver behavioral improvements. The company has 15 years of experience engineering solutions for both business to business (B2B) fleet customers to reduce operational costs and for business to consumer (B2C) end consumers to achieve better performance out of their vehicles. Earlier this year, Derive introduced the Derive VQ platform, which integrates active vehicle optimizations and third party data sources through a cellular, Wi-Fi and Bluetooth-connected vehicle interface. The first mass consumer application of the Derive VQ

technology, which is intended to help teenagers operate vehicles more safely, provides features such as active vehicle speed limiting, seatbelt-dependent ignition and cell phone distraction disablement. In 2018, Derive deployed this same platform in B2B fleet applications, where the Derive VQ platform integrates with workforce management software to provide a full fleet management and optimization solution.

Design & Match to Needs

Improving performance for early adopter auto enthusiasts was the initial inspiration behind the creation of Derive Systems' read-write software. Then, to address customer demand and to take advantage of the opportunity to expand to the fleet industry, it added capabilities to optimize fleet vehicles with solutions that help customers keep costs low and drivers safe, through fuel savings and speed control. Derive Systems recently embarked on its newest technology, a first in its industry, with the Derive VQ technology platform, which applies to both business and consumer users. The first consumer application, Teen Driver VQ, installed through the standard OBD-II vehicle interface, helps car owners set safe operating parameters for young drivers and thereby improve their driving safety while the vehicle is in use. Teen Driver VQ includes a seat-belt-dependent ignition, which requires drivers to fasten their seat belts before they are able to start the vehicle, as well as a dynamic speed limiting feature, which uses a cloud database of road speed limits to regulate the driver's speed, keeping it under designated limits in real time, wherever the vehicle is traveling. The software connects to a smartphone through the Bluetooth connection in the Derive VQ interface and restricts access to all of the teenager's phone functions when the vehicle is in gear, only providing alerts and updates depending on parental settings applied.

Compared to other solutions that allow parents to monitor teenage driving, Derive Systems' VQ platform not only empowers them to receive live updates but also actively upgrades the vehicle's operation to increase driver safety and speed limit compliance through its cutting-edge features. The difference is in making the vehicle itself safer, not relying on the driver to modify their behavior to achieve a safer driving experience. For example, there is no need to send a parent a text message warning that their child is speeding because the vehicle simply won't travel faster than the posted speed limit.

The fleet application takes this solution further, providing business features in addition to the safety features. Fleet managers can ensure proper vehicle usage compliance through the Derive VQ platform, which requires a driver to confirm - before the vehicle can be started - that the VIN, time, and date of usage is correct for their shift. Fleet managers can help deliver better customer service by automatically sending arrival time updates to service customers by linking a vehicle's GPS location, direction and speed of movement, and real time traffic data - as captured by Derive VQ - to its appointment scheduling system. Derive VQ helps to achieve fuel efficiency improvements by not only optimizing idle RPM, but also enabling manager-defined idle shut off periods.

Looking ahead to future applications, Derive Systems is expected to support new sensors and hardware, such as LIDAR and connected infrastructure, to further improve vehicle

performance. Frost & Sullivan believes that this software can help third-party developers deliver autonomous and connected products to existing and future vehicle line-ups, augmenting OEM efforts towards introducing dedicated connected and autonomous vehicles in the near future.

Quality & Positioning

Many telematics companies provide read-access telematics to help customers track their driving and vehicle performance. With read-access, however, customers only get static reports about the vehicle after it has been driven and must work to change driver behavior in order to see any improvements in a vehicle's fuel efficiency, safety and performance. Derive Systems works proactively by identifying its customers' requirements and issuing unique modifications to vehicle computers via its software platform which can both read from and write onto a vehicle's computer. Furthermore, Derive VQ is fully connected to the outside world, so it is continually integrating information beyond that provided by the vehicle in order to create the most intelligent driving experience. In other words, Derive Systems has developed a completely customizable software platform that can integrate usage information from the vehicle, contextual information from the environment and third party data sources, and preference information from the driver-owner or fleet manager to create personalized, optimized vehicles.

The platform allows developers to create apps, which can be used across different vehicles and use cases. Derive Systems' expertise in read-write access on vehicle operating systems empowers developers to improve the sustainability, safety, and savings for vehicle owners and drivers. Currently, Derive's own developers create apps for each solution; in the future, Derive will open its platform to a network of independent developers who can create their own customized apps.

The advantage that Derive Systems has over competition is its strong background in B2B and B2C applications and read-write access. Data is an important aspect in the development of driving aid applications and Derive Systems' experience in fleet applications and consumer markets has provided it with an ocean of data that it can extend to third-party developers to leverage. In addition, this flexibility allows for quicker adoption of advanced technologies in existing vehicles.

Customer Purchase Experience

Due to lack of differentiation between aftermarket telematics solutions delivered through the onboard diagnostics (OBD-II) port, purchase decisions have been reduced to nuances among providers in commoditized market. In contrast to existing telematics companies, Derive Systems provides a unique solution in its customizable product, meaning the software can be written exclusively to meet each customer's requirements and uploaded directly to the vehicle's computer through the use of the OBD-II port. Specifically, the software can be uploaded on any vehicle produced after 1996, the year that vehicles were mandated to be operated by a digital operating system accessed through an OBD-II port.

Nearly any vehicle owner can purchase the Derive Systems software and feel confident in knowing it will serve their specific needs. With an increased customer base, moreover, Derive Systems not only helps more drivers drive more fuel efficiently, significantly cutting down on CO₂ emissions that are generated as a result of fuel consumption, but also creates a more customized vehicle experience, with proper safety and power levels, and more intelligent technology integrations.

The Derive VQ interface is mounted onto the OBD-II port, where it stays as long as the software upgrades are desired. From this position, it both gathers vehicle information such as crash detection, speed, and acceleration rates to create insights like driver scorecards and provides upgrades the customer requests, such as speed governors and torque management. The product is connected to the cloud through an embedded 4G LTE link and to a driver's smartphone through the built in Bluetooth sensor. In this way, Derive Systems has made it possible for any vehicle to become a connected car.



Derive VQ Adapter (Image Source: Derive Systems)

By entering the consumer market, Derive Systems can upload its software onto a broad range of vehicles and allow customers to get the best performance out of their vehicles depending on driving style and environment. Frost & Sullivan believes that combining these vehicle upgrades with data such as driver scorecards, Derive Systems can partner with insurance companies to enable cheaper vehicle premiums. Moreover, functions such as seatbelt-dependent ignition and top-speed limiters, which bolster safety, will further reduce insurance costs and the prevalence of accidents on our roads.

Customer Ownership Experience

Stock vehicle software has generally been developed to fit nearly any driving scenario and driver profile. Derive Systems is therefore able to modify it to suit certain scenarios, such as

to reduce idle speed for fuel savings, which has been beneficial across large fleets that experience significant idling.

Two noteworthy use case examples of Derive Systems' solutions are listed below.

1. In partnership with Safelite Autoglass, Derive Systems upgraded Safelite's fleet software to help improve their fuel efficiency by 8.65% across a fleet of 6,000 vehicles, saving over \$2,500 per vehicle per year.
2. Derive Systems helped reduce the carbon footprint of Dish Network, a direct-broadcast satellite provider, which owns a fleet of 4,700 vehicles, by reducing more than 9,000 tons of CO₂ emissions. Overall savings for the company accounted for more than \$3.5 million per year, including fuel and maintenance savings. Modifications were made to the idle RPM levels, and top speed limiters were customized and uploaded onto the vehicles' Engine Control Module (ECM). Such modifications were done on a fleet of 4,500 Ford E-Series vehicles and generated savings of up to 10.5% in fuel consumption.

Significant savings, as seen in these two examples, combined with a low 'off-the-road' installation time of less than 15 minutes, has led Derive Systems to become a top choice among various police fleet operators like the City of Orlando, as well as other reputed companies like DHL and Roto-Rooter.

Frost & Sullivan finds that with the company's rich and successful history in working with fleets across various classes, the innovative software customization and hardware interface hold great potential to cater to ambulance and fire service fleets in the future, particularly to help improve first responders' ability to reach emergencies more quickly while also tracking vehicle vitals to proactively keep fleets in the best working condition possible.

Conclusion

Derive Systems has upgraded software in over 2 million vehicles since its inception, providing fleets and consumers with customized performance, safer, more intelligent driving experiences, and cost savings. The company also continues to reduce vehicle fuel consumption and indirectly contributes to reducing CO₂ emissions.

Expanding into the mass consumer market from strictly enterprise and enthusiast markets has been the first step for Derive Systems to increase the reach of its integrated software platform. Through the use of its innovative Derive VQ hardware and accompanying software and apps, Derive Systems developed Teen Driver VQ, which is expected to help curb distracted driver related accidents among teenage drivers. While not limited to this feature, the solution can also be used to implement other customer-specified features into new and existing vehicles to make the roads safer and more connected.

Considering the nearly 90 million vehicles added to the US roads alone in the last 5 years, Frost & Sullivan believes Derive Systems has the experience and technology needed to

create a connected network of cars and help develop sustainable, safer roads through adoption of its flexible Derive VQ adapter.

With its strong overall performance, Derive Systems is recognized with Frost & Sullivan's 2018 New Product Innovation Award in the US automotive software customization market.

Significance of New Product Innovation

Ultimately, growth in any organization depends upon continually introducing new products to the market and successfully commercializing those products. For these dual goals to occur, a company must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding New Product Innovation

Innovation is about finding a productive outlet for creativity—for consistently translating ideas into high-quality products that have a profound impact on the customer.

Key Benchmarking Criteria

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated two key factors—New Product Attributes and Customer Impact—according to the criteria identified below.

New Product Attributes

Criterion 1: Match to Needs

Requirement: Customer needs directly influence and inspire the product's design and positioning.

Criterion 2: Reliability

Requirement: The product consistently meets or exceeds customer expectations for consistent performance during its entire life cycle.

Criterion 3: Quality

Requirement: Product offers best-in-class quality, with a full complement of features and functionalities.

Criterion 4: Positioning

Requirement: The product serves a unique, unmet need that competitors cannot easily replicate.

Criterion 5: Design

Requirement: The product features an innovative design, enhancing both visual appeal and ease of use.

Customer Impact

Criterion 1: Price/Performance Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience

Requirement: Customers feel they are buying the most optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify Award recipient candidates from around the globe	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies 	Pipeline of candidates who potentially meet all best-practice criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized Award candidates
6 Conduct global industry review	Build consensus on Award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible Award candidates, representing success stories worldwide
7 Perform quality check	Develop official Award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best-practice Award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select recipient 	Decision on which company performs best against all best-practice criteria
9 Communicate recognition	Inform Award recipient of Award recognition	<ul style="list-style-type: none"> • Present Award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10 Take strategic action	Upon licensing, company is able to share Award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess Award's role in future strategic planning 	Widespread awareness of recipient's Award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



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