FROST & SULLIVAN BEST PRACTICES AWARD

MOBILITY PLATFORM ENABLER - NORTH AMERICA

Technology Innovation 2019

Zendrive
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Executive Summary

Recognizing market leadership in technology innovation

Zendrive’s software-first strategy sets it apart

Frost & Sullivan recognizes Zendrive for its blue ocean strategy, which positions it as a technology innovation leader in a segment where differentiation in hardware, service offerings, and value to end consumers is diminishing. Zendrive is committed to innovation in technology Mega Trends by emphasizing its data-driven business and staying true to its identity as a hardware-agnostic, go-to-market software Platform Company that enables industries related to the automotive industry, such as insurance and financing, aggregators, and OBD-II suppliers.

Zendrive separates itself from the competition in 3 key ways:

1. **Technology performance** - Zendrive improves collision risk by up to 49% among drivers on its platform by powering a 59% reduction in distracted phone use and a 21% reduction in speeding.

2. **Risk selection** - Zendrive has collected 10x more driving data than the largest insurers in the world, allowing them to power a predictive risk model 6x stronger than industry average. On using Zendrive for full-stack digital transformation insurers have seen its loss ratio quickly improve and far exceed industry averages.

3. **Patent portfolio** - Zendrive’s patented crash detection algorithms are deployed on 60 million devices worldwide, after performing at above 95% detection rates at BMW and other OEM crash facilities. The company’s robust international patent portfolio includes crash notification, driver detection, AV risk and more.

San Francisco-based Zendrive, Inc. was founded in 2013, and its core platform resides within consumer applications on mobile phones, security layers on affiliated partner applications, and as an algorithm engine on other business applications in the field of automotive insurance, aggregation modules, safety layers on applications, and telematics software.

Background and Company Performance

Industry Challenges

**Automotive Mega Trends and industry disruptions**

Over the past decade, the North American passenger vehicle segment has seen a significant increase in the number of vehicles on the road, which has increased the total average miles driven over the years as well. In addition, the automotive industry witnessed back-to-back disruptions in the past decade through Mega Trends, such as eCommerce in automotive retail for parts and maintenance, the emergence of electric vehicles, increased demand for shared mobility, and the evolution in automotive technology through autonomous cars. These disruptions and the emergence of parallel supporting industries have affected and
influenced offline retail stores in automotive retail as well as parts maintenance and the servicing status quo in the aftermarket.

Furthermore, multiple disruptions have given rise to affiliated industries within the auto segment, thus making it more complicated for companies to offer services associated with the automotive industry. In addition to business-to-consumer (B2C) retail, business-to-business (B2B) industries, such as commercial fleets (shared mobility), fleet maintenance, and fleet and consumer insurance companies, have seen a significant shift in operations in tandem with evolving Mega Trends.

**Data complexity and strength of algorithms**

This domino effect in the automotive industry through Mega Trends has simultaneously given rise to multiple affiliated industries that enable the incremental evolution in the automotive landscape, such as telematics, service aggregation, and blockchain. Telematics requires real-time data of vehicles and consumers to ensure services are available when requested, whereas service aggregation requires service providers handle demand based on geolocation requirements. Blockchain requires effective aggregation, storage, and standardized protocols to run atop the layers of distributed databases seamlessly.

The underlying theme in these technologies is the need for structured data and strong algorithms, which are only as strong as the data that they receive. Therefore, enterprises championing the evolution and seamless functioning of the auto services industry require structured datasets with strong algorithms, which are still a work in progress.

**Turning agnostic**

Telematics, in the form of in-vehicle-embedded systems and on-board diagnostics (OBD)-II-based devices, has had the most significant impact on the automotive, retail, services, and maintenance industries. Consequently, more start-ups, original equipment manufacturers (OEMs), and aftermarket suppliers have been receiving a share of revenues from prognostics; however, the segment has been commoditized as well. The insurgence of generic Asian dongles and the dynamic evolution of business models pertaining to the segment means hardware, services, and value are not differentiated for end consumers, and the future is hardware agnostic. The rise of cyber risk associated with connecting external technology to the vehicle itself as well as lessons from failed attempts to operationalize OBD-based and usage-based insurance plans at large scale led some insurers to pause or divest from hardware-based programs. These, combined with the need to differentiate, has become the biggest challenge in the segment and has led to simultaneous micro disruptions within the space, thus increasing counter automotive technology in the form of flexible software platforms.
Technology Attributes and Future Business Value

Industry and Product Impact

Zendrive’s solution is an end-point-agnostic software platform that requires no hardware, dongle, or any linked peripherals for operation, other than the consumer’s smartphone. With this platform, data points collected from smartphones are 98% accurate, making Zendrive one of the few companies in the auto data tracking segment to be end-point agnostic or hardware agnostic in general.

Software solutions are superior to hardware for a number of reasons captured in the chart below.

<table>
<thead>
<tr>
<th>Evaluation factor</th>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices in market</td>
<td>Billions of iOS &amp; Android devices have been sold in recent years.</td>
<td>There are only few million OBD-II hardware devices in use globally</td>
</tr>
<tr>
<td>Security</td>
<td>Billions have been invested making mobile devices secure.</td>
<td>OBD-II devices plug into the car’s CAN Bus port, which potentially exposes them to security risks from hacking</td>
</tr>
<tr>
<td>CPU</td>
<td>Mobile technology enables sophisticated AI algorithms to run on the endpoint and respond instantly to what’s happening on the road. Decreased network cost.</td>
<td>Hardware must send data via the network back to servers for analysis. Increases network cost and delays response time.</td>
</tr>
<tr>
<td>Detection capability</td>
<td>With Distracted Driving a growing epidemic, software follows the most dangerous element in the car: the driver.</td>
<td>Hardware can only track what happens to the car itself, not the driver.</td>
</tr>
<tr>
<td>Compliance</td>
<td>No way to game the system, since uninstalling the app or disabling location services is tracked.</td>
<td>Turning off the car or unplugging an OBD-II device also shuts off data collection</td>
</tr>
<tr>
<td>Sensor accuracy</td>
<td>Far higher quality of mobile sensor that improves with each new version of iOS/Android. More accurate signal than what hardware can achieve.</td>
<td>Hardware sensors are limited to data provided by the vehicle.</td>
</tr>
</tbody>
</table>
Zendrive has four main industry affiliations in wireless carriers (telecom), fleet and fleet maintenance (auto servicing), insurance providers (banking and financial institutions), and smartphone applications (mobility and family safety). The company tracks the following four major real-time auto data points on the user’s smartphone: speeding, hard braking, aggressive acceleration, and distracted driving. Recently, Zendrive launched the industry’s first ever Stop-Sign compliance risk factor, leveraging more than 160 billion miles of driving data to infer and score compliance with rules of the road. This new risk factor is unique not only because no other telematics or insurer has access to it, but also because it is highly predictive of collisions and claims. The platform’s algorithms effectively detect and distinguish a driver’s smartphone from a passenger’s smartphone, without the need for any secondary device. In addition, in the event of an accident, the software platform can notify roadside assistance (RSA), the driver’s and passengers’ families, 911, and insurance companies where the claims process can be digitized and accelerated. The platform’s highly tested and tuned actuarial risk models help insurance companies assess risk profiles, package services, and create products based on driver pattern analysis. This feature is pivotal in fleet insurance and fleet maintenance tracking applications that gamify fleets to score and improve driving.

Zendrive significantly extends existing OBD-II product and telematics offerings with an effective software-first solution that is industry agnostic, in addition to having end-point-agnostic characteristics.

**Scalability and Visionary Innovation through Application Diversity**

As of Q1 2019, Zendrive’s software development kit (SDK) platform is currently installed across 60 million devices through partnerships with wireless network carriers and mobile app developers, such as automotive, insurance, and generic smartphone apps. Zendrive provides safety layers within these apps, enabling it to track and gain access to large volumes of user data. The platform’s algorithms currently run atop 160 billion miles of data to provide user-specific insights based on strong data science pattern analysis algorithms. This dataset increases by an additional 11 billion miles monthly.

Based on Frost & Sullivan research, Zendrive is positioned as a leading differentiator on the metric of the data volume it has gathered and processed, compared to its competitors. The scale of automotive miles Zendrive has accessed to gain insights is peerless because most competitors rely on hardware installations to begin reading data points. Moreover, Zendrive has robust scalability potential because it scales its existing business through partnerships with network carriers, thus increasing its app base, and adds to that by providing a platform for telematics companies. This platform complements hardware OBDs and offers software that relatively smaller companies can use to scale their businesses, without investing in software development.

Zendrive is a committed technology enabler in the autonomous mobility segment, empowers companies invested in autonomous mobility to train and test algorithms, and powers native artificial intelligence (AI) networks by providing its vast data and patented
algorithms to drive forward advancements in mobility. Currently, competitors, primarily OBD-II hardware suppliers and aggregators, do not have the AI capability to empower and test autonomous vehicles with their existing datasets.

Zendrive’s growing native app-based installations, direct-to-enterprise (D2E) business model, and vision to enable companies in the autonomous mobility space through its algorithms position it higher on the business scalability coefficient scale, compared to its contemporaries that are only involved in either of the aforementioned businesses.

**Customer Acquisition through Technology Licensing**

Zendrive has two tested customer acquisition models and has a growing smartphone installation base enabled by wireless carriers and app partnerships in the B2B2C segment and operational partnerships as a technology enabler in the B2B2B segment. In the latter segment, Zendrive provides its platform for OBD-II hardware companies that are searching for a tested platform.

Zendrive’s patents and intellectual property (IP) on its algorithms make it easier to acquire business partnerships, and the company licenses its platform to many smartphone application providers across various segments. Zendrive is the consumer partner for specific apps, such as GasBuddy, where it helps identify fuel efficiency metrics for its installed base. For example, with DropCar, Zendrive gamifies fleets on the valet platform. HopSkipDrive is a kids’ ride-sharing platform, where Zendrive provides safety and dependability layers within the app. In addition, the company partners with fleet operation businesses, such as Fleetio, in fleet management and driver behavior analysis. One of Zendrive’s key businesses is risk assessment and ranking. For example, the company enables insurance companies, such as Atlas Insurance, to quantify risks based on its wide-scale consumer endpoint app deployment and enormous anecdotal, real-time, and real-world ride data.

Zendrive tracks user data based on app-based installations through underlying layers within the app and emphasizes privacy and user anonymity. Moreover, data monetization is one of the key revenue streams for most competitors in this space; however, Zendrive is committed to avoiding monetizing user data.

Zendrive’s commitment to multiply its customer base, increase data volumes, and license its platform without the need to monetize user data is part of a platform enabler niche within the auto industry. Through its strong algorithms and IP, the company is striving to be a platform enabler, which is a venerable customer acquisition model, rather than a data seller.

**Financial Performance and Brand Equity**

Over the past couple of years, the telematics industry has undergone multiple transitions. The number of industry exits in the OBD-II-based dongle segment has increased, mainly because of the evolving nature of products, from hardware-based solutions to software-based solutions, and is transitioning from a software solution to a platform altogether.
Zendrive bypassed this bubble by beginning its operations as an end-point agonistic platform provider, thus ensuring its 10 times growth in revenue from 2018 to 2019, which is three times the year-over-year (YoY) growth from 2017 to 2018. Low operational costs and high earnings before interest, tax, depreciation, and amortization (EBITDA), ensured by its low capital expenditure (CAPEX) because of its negligible investment in assets, make Zendrive increasingly profitable, in terms of operations.

The company’s hardware-driven peers have had to accommodate evolutionary transitions in products to stay relevant, thus losing both market momentum and profits to turn agnostic or invest in software solutions; however, Zendrive has capitalized on shifting trends and has increased its revenue and margins by remaining asset light.

Zendrive has cemented its brand equity within its commercial B2B2B base through its strong financial performance. The company’s operating margins, increasing data volumes, patented IP, and algorithms position it as one of the go-to brands in the space for its business partners. Furthermore, Zendrive is looking to invest in blockchain and consumer applications that have auto financial flavors that will further increase the company’s brand equity within its existing consumer base and increase its partnerships in blockchain-enabled auto financial institutions in the next three to five years.

Conclusion
Zendrive has established itself as the go-to platform provider for auto and financial applications in the auto application segment. With its commitment to enable contemporaries that require software platforms for dongle-based hardware solutions and its partnerships with multiple stakeholders across industries to provide application layers, the company has built a strong portfolio and leverages its D2E partnership model, thus adding contrasting dimensions to its capabilities.

Zendrive creates value for customers by providing services through its strong algorithms and IP, while simultaneously investing in accelerating disruptive technologies and Mega Trends in autonomous vehicles that will have a lasting impact on the automotive landscape. Therefore, Zendrive has effectively positioned itself as the apex provider of enabling technology for emerging and existing companies in the mobility segment.

With its strong overall performance, Zendrive has earned Frost & Sullivan’s 2019 Technology Innovation Award in the North American mobility platform enabler industry.
Significance of Technology Innovation

Ultimately, growth in any organization depends on finding new ways to excite the market and maintaining a long-term commitment to innovation. At its core, technology innovation, or any other type of innovation, can only be sustained with leadership in 3 key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Technology Innovation

Technology innovation begins with a spark of creativity that is systematically pursued, developed, and commercialized. That spark can result from a successful partnership, a productive in-house innovation group, or a bright-minded individual. Regardless of the source, the success of any new technology is ultimately determined by its innovativeness and its impact on the business as a whole.
Key Benchmarking Criteria

For the Technology Innovation Award, Frost & Sullivan analysts independently evaluated 2 key factors—Technology Attributes and Future Business Value—according to the criteria identified below.

Technology Attributes

- Criterion 1: Industry Impact
- Criterion 2: Product Impact
- Criterion 3: Scalability
- Criterion 4: Visionary Innovation
- Criterion 5: Application Diversity

Future Business Value

- Criterion 1: Financial Performance
- Criterion 2: Customer Acquisition
- Criterion 3: Technology Licensing
- Criterion 4: Brand Loyalty
- Criterion 5: Human Capital

Best Practices Award Analysis for Zendrive

Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows research and consulting teams to objectively analyze performance according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation. Ratings guidelines are illustrated below.

RATINGS GUIDELINES

The Decision Support Scorecard considers Technology Attributes and Future Business Value (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criterion are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.
The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, Frost & Sullivan has chosen to refer to the other key participants as Competitor 1 and Competitor 2.

<table>
<thead>
<tr>
<th></th>
<th>Technology Attributes</th>
<th>Future Business Value</th>
<th>Average Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zendrive</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Competitor 2</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Competitor 3</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**Technology Attributes**

**Criterion 1: Industry Impact**  
Requirement: Technology enables the pursuit of groundbreaking ideas, contributing to the betterment of the entire industry.

**Criterion 2: Product Impact**  
Requirement: Specific technology helps enhance features and functionalities of the entire product line for the company.

**Criterion 3: Scalability**  
Requirement: Technology is scalable, enabling new generations of products over time, with increasing levels of quality and functionality.

**Criterion 4: Visionary Innovation**  
Requirement: Specific new technology represents true innovation based on a deep understanding of future needs and applications.

**Criterion 5: Application Diversity**  
Requirement: New technology serves multiple products, multiple applications, and multiple user environments.

**Future Business Value**

**Criterion 1: Financial Performance**  
Requirement: Potential is high for strong financial performance in terms of revenue, operating margins, and other relevant financial metrics.

**Criterion 2: Customer Acquisition**  
Requirement: Specific technology enables acquisition of new customers, even as it enhances value to current customers.

**Criterion 3: Technology Licensing**  
Requirement: New technology displays great potential to be licensed across many verticals and applications, thereby driving incremental revenue streams.
**Criterion 4: Brand Loyalty**
Requirement: New technology enhances the company’s brand, creating and/or nurturing brand loyalty.

**Criterion 5: Human Capital**
Requirement: Customer impact is enhanced through the leverage of specific technology, translating into positive impact on employee morale and retention.

**Decision Support Matrix**
Once all companies have been evaluated according to the Decision Support Scorecard, analysts then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.
**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 practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

<table>
<thead>
<tr>
<th>STEP</th>
<th>OBJECTIVE</th>
<th>KEY ACTIVITIES</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monitor, target, and screen</td>
<td>Identify award recipient candidates from around the world</td>
<td>Conduct in-depth industry research, Identify emerging industries, Scan multiple regions</td>
</tr>
<tr>
<td>2</td>
<td>Perform 360-degree research</td>
<td>Perform comprehensive, 360-degree research on all candidates in the pipeline</td>
<td>Interview thought leaders and industry practitioners, Assess candidates’ fit with best practices criteria, Rank all candidates</td>
</tr>
<tr>
<td>3</td>
<td>Invite thought leadership in best practices</td>
<td>Perform in-depth examination of all candidates</td>
<td>Confirm best practices criteria, Examine eligibility of all candidates, Identify any information gaps</td>
</tr>
<tr>
<td>4</td>
<td>Initiate research director review</td>
<td>Conduct an unbiased evaluation of all candidate profiles</td>
<td>Brainstorm ranking options, Invite multiple perspectives on candidates’ performance, Update candidate profiles</td>
</tr>
<tr>
<td>5</td>
<td>Assemble panel of industry experts</td>
<td>Present findings to an expert panel of industry thought leaders</td>
<td>Share findings, Strengthen cases for candidate eligibility, Prioritize candidates</td>
</tr>
<tr>
<td>6</td>
<td>Conduct global industry review</td>
<td>Build consensus on award candidates’ eligibility</td>
<td>Hold global team meeting to review all candidates, Pressure-test fit with criteria, Confirm inclusion of all eligible candidates</td>
</tr>
<tr>
<td>7</td>
<td>Perform quality check</td>
<td>Develop official award consideration materials</td>
<td>Perform final performance benchmarking activities, Write nominations, Perform quality review</td>
</tr>
<tr>
<td>8</td>
<td>Reconnect with panel of industry experts</td>
<td>Finalize the selection of the best practices award recipient</td>
<td>Review analysis with panel, Build consensus, Select recipient</td>
</tr>
<tr>
<td>9</td>
<td>Communicate recognition</td>
<td>Inform award recipient of recognition</td>
<td>Present award to the CEO, Inspire the organization for continued success, Celebrate the recipient’s performance</td>
</tr>
<tr>
<td>10</td>
<td>Take strategic action</td>
<td>Upon licensing, company is able to share award news with stakeholders and customers</td>
<td>Coordinate media outreach, Design a marketing plan, Assess award’s role in strategic planning</td>
</tr>
</tbody>
</table>
The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the 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, resulting in 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.

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best-practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit http://www.frost.com.