Transformative Trends Reshaping the Future of Automotive Aftermarket and Supply Chain

Presentation by:

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Senior Partner
Transformational Shifts Reshaping the Future of Mobility

Connectivity

Cognitive Era and Autonomous Mobility

Digitization of Retail

Future of Aftermarket

New Logistics/Supply Chain Models

New Business Models

Health Wellness and Wellbeing in Cars

Rise of electrification
Transformational Trend 1: 5G Rollout in Europe: Road Map and Vision

5G technology will enable zero latency applications in Vehicles such as V2V or V2I communications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Speed: 50 KBPS</th>
<th>Speed: 250 KBPS</th>
<th>Bandwidth: 20 MBPS</th>
<th>Bandwidth: 200 MBPS</th>
<th>Bandwidth: 1 GBPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Voice Calls</td>
<td>Digital Voice Calls</td>
<td>Data</td>
<td>Video Streaming</td>
<td>M2M</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>1G</th>
<th>2G</th>
<th>3G</th>
<th>4G</th>
<th>5G</th>
</tr>
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<table>
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<tr>
<th>Generation</th>
<th>1G</th>
<th>2G</th>
<th>3G</th>
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5G Targets

- Less than 1 millisecond Latency
- 90% Energy savings
- 0 perceived down time for service provision
- 7 trillion M2M wireless connections
Future Space Jam
There will be 1,213 Satellites Launched, Cumulatively, Globally between 2011 - 2021.

<table>
<thead>
<tr>
<th>Category</th>
<th>2011*</th>
<th>2021*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>365</td>
<td>559</td>
</tr>
<tr>
<td>Large</td>
<td>327</td>
<td>220</td>
</tr>
<tr>
<td>Medium</td>
<td>129</td>
<td>107</td>
</tr>
<tr>
<td>Small</td>
<td>71</td>
<td>102</td>
</tr>
<tr>
<td>Micro</td>
<td>73</td>
<td>225</td>
</tr>
<tr>
<td>Nano</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>Pico</td>
<td>59</td>
<td>1,213</td>
</tr>
</tbody>
</table>

- R&D
- Reconnaissance
- Navigation
- Earth Observation
- Communication

Satellite Weight Categories:
- Heavy: 5,400 kg+
- Large: 4,200-5,400 kg
- Medium: 2,500-4,200 kg
- Small: 500-2,500 kg
- Micro: 100-500 kg
- Mini: 10-100 kg
- Nano: 1-10 kg
- Pico: 0.1-1 kg

Cumulative Launches by Category:
- R&D: 365
- Reconnaissance: 559
- Navigation: 220
- Earth Observation: 107
- Communication: 225

Future Space Jam: There will be 1,213 Satellites Launched, Cumulatively, Globally between 2011 - 2021.
Implication: 5G and Satellites boom will make our cars cognitive and intelligent

Over 2 Gb data needs to be harnessed at a given point. Needs 5G speed

Satellite data at 50 megabits per second with a transmission speed beyond a gigabit-per-second

Continuous processing of real-time information to windshield

Source: Frost & Sullivan
**Implication: Re-thinking Automotive with Big Data**
Meaningful data sets is expected to grow from 10MB to 5GB in an average connected car by 2017/2018

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<tr>
<th>Internet Aggregators</th>
<th>Price transparency, unbundling of activities</th>
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<tr>
<td>Real-Time Prognostics</td>
<td>Proactive maintenance, warranty management</td>
</tr>
<tr>
<td>Personalization &amp; Customization</td>
<td>‘Me-commerce’, Social media analytics and reporting for targeted ads</td>
</tr>
<tr>
<td>New Products</td>
<td>User-based insurance, Telematics</td>
</tr>
<tr>
<td>Dynamic Pricing</td>
<td>Real-time billboard pricing, Price different vouchers, Surge pricing (Uber)</td>
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Case Study: Big Data and Connectivity Will Transform the Car Insurance Industry in Future

http://www.drivelikeagirl.com/

CAR INSURANCE DESIGNED FOR GIRLS*

17 - 25 year olds save the most
Sub Trend: Boom in the Automotive Startup Ecosystem
There has been a shift in the automotive value chain; over 1700 new startups are unbundling the car.
Transformation Shift No. 2: Cognitive Era
Cars Will Need These 6 Cognitive Technologies For AI
Implication: Voice Recognition – Women’s call outs to take over your car: Key technology players will bring voice functionality into cars
Sub Trend: Autonomous Cars - $60bn per annum market opportunity in 2030, 50% of which will be in Software

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<thead>
<tr>
<th>Level</th>
<th>No Assist</th>
<th>Early Warning Systems</th>
<th>Traffic Control</th>
<th>Awareness for Takeover</th>
<th>General Awareness</th>
<th>Full Autonomous Driving</th>
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<tr>
<td>New Vehicles</td>
<td>2011</td>
<td>40 million</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>2016</td>
<td>15 million</td>
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<td></td>
<td>2018</td>
<td>5 million</td>
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<tr>
<td>Level 0</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 4</td>
<td>Level 5</td>
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Autonomous vehicles: Disruptive to industries beyond automotive

- Public transport
- Parking garages
- Trucking
- Energy/fuel
- Car repair and parts
- Ride-hailing companies
- Fast food
- Real estate
- Insurance
- Hotels
- Media and entertainment
Future of Freight Delivery; Amazon Prime - Airspace

Amazon proposes a 200-foot designated airspace – between 200 and 400 feet from the ground – to be reserved for drone flights,
Traditional Supply Chain Compared To Drone Enabled Supply Chain

Drone enabled deliveries could cost as less as $0.07 per package in comparison to $1.20 cost incurred through traditional channels.
The Five Pillars of Digitalisation For The Automotive Industry to Reach Nirvana

1. Connected supply chain
2. Industry 4.0
3. Connected and automated car
4. Digital retailing and VRM
5. Mobility as a service
Implication: Future of Formula 1 Racing - Autonomous

Source: Frost & Sullivan
Implication: Future of (flying) cars

Source: Airbus
Video: There will always be a market for traditional products
### Transformation Shift No. 3: Digitization of the Retail Network
Unbundling of the Automotive Business - The Multi Channel strategy for the future

#### Bundled (Single Location, One-stop-Shop)

<table>
<thead>
<tr>
<th>New Cars</th>
<th>Used Cars</th>
<th>Finance &amp; Insurance</th>
<th>Service</th>
<th>Parts</th>
</tr>
</thead>
</table>

#### Unbundled (Multiple services, channels, aggregated online)

<table>
<thead>
<tr>
<th>Online Stores</th>
<th>Warehouses</th>
<th>Online Insurance</th>
<th>On-the-air diagnostics</th>
<th>E-marketplace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pop Up Stores</td>
<td>Lifestyle Stores</td>
<td>Rental &amp; Leasing</td>
<td>Service &amp; Maintenance</td>
<td>Mobility Solutions</td>
</tr>
<tr>
<td>Flagship Stores</td>
<td>Store in a Store</td>
<td>Pay-as-you drive</td>
<td>Heavy Repairs</td>
<td>Finance Options</td>
</tr>
</tbody>
</table>
Digitalization of the Aftermarket Parts Market

€5bn worth of parts sold on-line and expected to grow four folds by 2020 in EU

Automotive Parts and Service eRetailing Market: Online Parts vs. Total Aftermarket, Europe, 2013 and 2020

- Total Aftermarket
- Online

Note: All figures are rounded. The base year is 2013. Source: Frost & Sullivan
Case Study: BMW’s eCommerce Strategy
Over the years, BMW has explored different market outreach strategies in eCommerce channel globally

BMW Store on eBay Motors (UK)

BMW Online Store (Europe)

BMW Direct eStore (Germany)
eCommerce in Automotive Aftermarket—BMW Web Store
BMW could expand own web store channel strategy outside of Germany depending on the outcome of current pilot project

BMW Direct eStore (Germany)

Products Coverage:
Driveline, Suspension, Electricals, Systems, Exterior Body Parts, HVAC and Lighting

Payment Options:
Online banking, PayPal

Fulfillment Options:
• Delivery at Choice of Location (shipped from dealer location)
• Pickup from BMW dealership

Shipping Cost:
• Varies according to order weight (minimum shipping is EUR 5.99 across Germany)
Bricks n clicks in Future eService Aggregation

Service Delivery Model
1. Customer visits service provider Web site or app
2. Customer searches for parts required for service
3. Customer pays for parts, related service online
4. Part delivered to customer or store
5. Customer takes product to shop; repair completed

Service Aggregator Model
1. Customer visits third-party Web site or app
2. Customer searches for best deal for parts, service
3. Customer pays on Web site or app (optional)
4. Part delivered to customer or customer collects at store
5. Customer takes vehicle to shop; repair completed

Source: Frost & Sullivan analysis.
FUTURE OF AFTERMARKET
Automotive Aftermarket Services Adoption Landscape Shift from parts (hardware) based selling to a services based business model

- Remote Servicing
- Dongle Based Connected Car Solution
- Direct eStores
- B2B Parts and Accessories Marketplace
- B2C Parts and Accessories Marketplace
- Express Service Store
- Service Aggregation
- Service As You Fly
- Mobile Service at Customer Location
- In-vehicle Sales
- Subscription based selling

Source: Frost & Sullivan
Future Disruptors – Potential Impact on Aftersales

AUTONOMOUS CARS
- Reduction in collision, bad driving – leading to less wear/tear, repair opps
- Higher OEM loyalty; greater adherence to service
- More complex systems – regular software upgrades

CONNECTED CARS
- Direct, increased touchpoints with customers
- Opportunities with data – predictive analytics, in-car promotions, other services (e.g. Drive mode on demand)
- Big question – who owns data?

HYBRID/ELECTRIC CARS
- Reduced maintenance needs
- Battery refurbishment for 2nd life
- Other products – home chargers etc.

NEW MOBILITY MODELS
- Opportunities with fleets
- New ownership modes - loyalty through renting, sharing, other modes of transportation, redefine service
Learn More About “New Mega Trends” and Frost & Sullivan
Sarwant.singh@frost.com/ +44 7949040541

Published Book:
New Mega Trends
Implications for our Future Lives
By Sarwant Singh

Publisher: Palgrave Macmillan

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Mega Trends: Strategic Planning and Innovation Based on Frost & Sullivan Research

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