Technology driven M&A in the automotive industry

From automobile to autonomous

EY Study | October 2018
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The rapid technological changes bring the automotive industry at the verge of a strategic crisis, despite record sales. Companies move to M&A to rapidly adapt their portfolios and proactively react to the changing environment.

As a result, technology driven M&A plays an increasing role in the automotive industry, and increased by 60% since 2015.

Core technologies that drive tech-deals evolve around the electrification of Powertrain, Autonomous Driving capabilities, and Connectivity. In particular, Software Applications play an increasing role in M&A deal activity. Hardware deals revolve around Power Electronics and sensors.

Innovative processing and manufacturing technologies such as 3D Printing play no role in automotive M&A deals.

Automotive OEMs shift their attention to revenue creation and use M&A to reinvent themselves as Mobility as a Service providers with shared vehicle capabilities.

Automotive suppliers remain focused on product innovation and move up the value chain to challenge the space typically occupied by OEMs. The fight over the supremacy of core technologies in Powertrain and Autonomous Driving technologies intensifies.

German companies show a particular appetite for technologies for Mobility as a Service, Connectivity and Autonomous Driving capabilities, while acquisitions for Powertrain technologies decrease.

As a leader in the global automotive industry, Germany has more outbound M&A activity than inbound.
As industries are converging, automotive firms turn to M&A to keep pace with technological change

The automotive industry at the verge of a revolution

The automotive industry is undergoing unprecedented changes on multiple fronts, from socio-political pressure for a low-carbon footprint, over changing customer demands from multi-purpose vehicles to diverse mobility offerings, to radical product innovations enabled by breakthroughs in basic technologies previously not available.

To succeed in this environment, players at every level of the value chain – from component suppliers to commercial or light vehicle manufacturers to retailers – have to review their product portfolio and adapt to the changing needs in the automotive value chain.

Despite record sales, the automotive industry is at the verge of a strategic crisis, with new technologies being introduced every year, and incumbent firms lose ground in core competencies of the future. For the first time, technological core competencies were not developed in-house, but brought in by new entrants that lead the way to the digitalization of core components. In this environment, M&A becomes a key vehicle to defend the market position in the future.

This study looks at technological driven M&A activity in the automotive industry from 2015 to 2017.

Technological trends in the automotive industry

Digitalization is transforming entire businesses, from internal processes over product capabilities to unexploited value streams. EY has identified three key areas impacted by technological advances in the automotive industry:

1. Technologies related to processes (‘Process technologies’):
   - New technologies can drive efficiency in the processes of the company, such as manufacturing processes
   - Key processing technologies in the automotive industry include Industry 4.0, 3D Printing, Smart Supply Chain Management, and Clean Production

2. Technologies impacting the final product (‘Product technologies’):
   - Technologies that are applicable and planned for the final product of the company, i.e. technologies that are applied to the vehicles. Such technologies can revolve around hardware, but are increasingly driven by software
   - Key product innovations include new Powertrain technologies, Connectivity, and Autonomous Driving

3. Technologies aimed at revenue improvements (‘Revenue stream technologies’):
   - New technologies that are used to generate additional revenue, in particular by exploiting new sales channels
   - Revenue improving technologies include E-Commerce for the sale of vehicles and parts, focused dealership strategies for electronic vehicles, and new offerings for Mobility as a Service (MaaS)
The battle for disruptive technologies is red hot. Established automotive players are fighting for the lead in key future technologies, worrying that new entrants from the digital space will inject themselves between today’s players and their customers. Upcoming technology leaders will leverage their capabilities to gain a footing in the industry. M&A is mission critical for the incumbent players to conquer and retain that space, protecting current revenues and opening up new business models.

Dr. Marc Förstemann
EY Partner, GSA Transportation Transaction Advisory Leader
Deal development at a glance

Number of technology investments increased by 60% since 2015 – deal values declined by 38% in the same period

Evolution of Technology Automotive Investments

Degree of Investment

Commentary

- In 2017, OEMs and automotive suppliers conducted 1,238 mergers and acquisitions globally, 11% – 131 deals – with an investment volume of $5.16bn are driven by the objective to acquire new technologies.
- Technology driven investments are constantly growing in importance: While such investments accounted for only 7% in 2015 and 9% in 2016, it rose to 11% of the total number of automotive deals in 2017.
- Confidence in the targeted technologies is increasing, and investors take high stakes: 72% of disclosed deals are majority investments, only for 28% a minority share investment is made, indicating a growing aspiration of automotive suppliers and OEMs to fully own and control relevant technology.
- Over a 3-year period, deal values of technology investments declined by 38%, while the total number of technology driven deals increased by 60%. At the same time, the number of majority investments increased. This indicates an entry at an earlier stage of their development at a lower enterprise value.
In 2017, technology driven deals are centered around powertrain, autonomous driving and connectivity.

Commentary

- In 2017, key technologies targeted via M&A included:
  - Powertrain, with 42 deals (32%)
  - Autonomous Driving, with 36 deals (28%)
  - Connectivity, with 21 deals (16%)
  - Other, with 32 deals, including Mobility as a Service technologies for revenue improvement and Industry 4.0 to increase manufacturing process efficiency

- Product-related technologies are again in the focus of automotive firms: With 82% of all deals being centered around technologies to optimize the automobile as the core ‘product’, process-focused technologies as well as technologies to explore and develop additional revenue streams (e.g. car sharing concepts and applications) account for the minority of deals with 6% and 12% respectively

Technology driven M&A deals in 2017

- Powertrain: 36 (28%)
- Autonomous Driving: 21 (16%)
- Connectivity: 32 (24%)
- Others: 9 (7%)
  - Mobility as a Service: 6 (5%)
  - Industry 4.0: 5 (4%)
  - Sales: 3 (2%)
  - Product Architecture: 3 (2%)
  - Vehicles: 3 (2%)
  - After Sales: 3 (2%)
  - Flying Vehicles: 1 (1%)

Total technology driven M&A deals in 2017: 131
The number of deals made for product technologies is steadily increasing – driven by autonomous driving, powertrain and connectivity

Most deals are made for Powertrain related technologies, with Autonomous Driving in the heels, and Connectivity catching up to 2015 numbers after a drop in 2016.

1. Powertrain

- The steep increase of deals aimed at acquiring technologies for electric vehicles in 2016 was followed by another strong year with 31 deals in 2017.
- Alternative technologies for zero emission powertrains, like fuel cell technology, is overall small but shows steady growth, as companies keep options open.

2. Connectivity

- In particular deals for software applications have increased from just 2 in 2016 to 7 in 2018.
- For the first time, technologies connecting vehicles to the Smart City play a role, with a total of 3 deals.

3. Autonomous Driving

- Autonomous Driving has sparked the interest of investors in 2017, with a staggering total of 36 deals made for technologies related to Autonomous Driving, up from only 10 deals in 2015 and 20 in 2016.
- Sensors and cameras lead the way in M&A activity for Autonomous Driving technology, with 12 deals in 2017.
Investments targeting revenue improvements are focused on new retail channels like Mobility as a Service

- Investments made into technologies to improve sales are steadily increasing
- While 2015 saw an equal distribution between technologies aimed at vehicle sales, parts sales and the new channel of mobility services, the focus shifted to deals aimed at providing Mobility as a Service as a new channel for sales

1. Mobility as a Service
   - The technological portfolio for moving to mobility service provider is diverse, with acquisitions made to advance rental services, taxi services, shared vehicle services and customer apps
   - Overall, deals still concentrated on shared vehicle providers in 2017, with a minor decrease from 7 to 6 deals
   - Somewhat surprisingly, stand-alone deals made for apps aimed at mobility services do not play a significant role in the move of the automotive industry from manufacturing to service providers

2. Sales
   - Investments were made to advance technologies for classic distribution channels via retailers, to open new channels in E-Commerce, and in particular to move into providing Mobility as a Service
   - In 2017, the focus on E-Commerce channels shifted to the sale of used vehicles, with a total of 3 deals

3. After Sales
   - For After Sales, deals to acquire technologies focus on remote diagnostics for users and technicians. This technology can help in the development of autonomous vehicles, for which remote diagnostics plays a key role for efficient maintenance
Industry 4.0 dominates the technology driven deals in advancement of manufacturing and processing techniques

Number of deals in Processing Technologies

Main technologies within the Industry 4.0 deals

Commentary

- Overall, investments made to advance processing technologies are still high with 8 deals, down from 9 in 2016 but up from only 2 in 2015
- The deals are driven by an interest in Industry 4.0 technologies, which shows a steady increase since 2015 and is up two deals since 2016
- While in 2016 three deals aimed at reducing emissions, smart supply chain management and 3D Printing, all deals in 2017 focused on Industry 4.0
- New manufacturing techniques such as 3D Printing play no role in the technology driven M&A deals in 2017

- The technologies driving the Industry 4.0 related deals are diverse, from Electronics hardware, over Software, to Internet of Industrial Things (IoIT), Robotics and Big Data
- In 2017, Electronics Hardware played a larger role for Industry 4.0 related deals for the first time
- Big Data storage, handling and mining still plays only a minor role, with only 1 deal in 2016 and 0 deals made in 2015 and 2017
- Overall, the number of investments made for Industry 4.0 software, in particular smart control software, decreased from 3 deals to 2 from 2016 to 2017
With rapid technological changes in the market, firms need to review their portfolios and rethink their business models. While OEMs reinvent themselves as service providers, suppliers attack to fight for a leading position as providers of core future technologies.

Constantin M. Gall
EY Partner, GSA Automotive and Transportation Transaction Advisory Leader
Automotive suppliers remain focused on product innovation, while OEMs increasingly shift attention to technologies for revenue creation

**Type of Acquirer**

- **Revenue Stream**
  - **Supplier**: 90% in 2015, 81% in 2016, 84% in 2017
  - **OEM**: 10% in 2015, 19% in 2016, 16% in 2017
  - In 2017, automotive suppliers closed 110 technology deals – 5x more investments than made by OEMs (21 deals)
  - After a strong year of 2016 for OEMs, suppliers came back and increased their share of technology driven M&A activities from 81% to 84% in 2017
  - Despite the decrease in percentage, OEMs’ deal level remained stable and actually increased in absolute terms, with 5% growth in number of deals

- **Product**
  - **Supplier**: 14% in 2015, 11% in 2016, 9% in 2017
  - **OEM**: 8% in 2015, 3% in 2016, 2% in 2017

- **Process**
  - **Supplier**: 7% in 2015, 8% in 2016, 8% in 2017
  - **OEM**: 3% in 2015, 11% in 2016, 14% in 2017

**Technology Investments per Type of Acquirer**

- **OEM**
  - Revenue Stream: 6% (2015), 14% (2016), 86% (2017)
  - Product: 38% (2015), 40% (2016), 60% (2017)

- **Supplier**

- The majority of deals done by OEMs still reverts around product related technologies, with 57% in 2017
- However, the focus of technology M&A activities steadily shifts towards revenue stream: Nearly every second deal in 2017 (43%) is linked to future revenue streams (e.g. ‘Mobility as a Service’ or sales technologies). At the same time, product-related investments are gradually decreasing from 62% in 2015 to 57% in 2017
- Automotive suppliers have an even stronger focus on investments to product-related technologies, as deals account for 83%, 82% and 86% in years 2015-17
- In contrast to OEMs, suppliers invest in process-related technologies: In 2017, 8% of all deals were related to process technologies. In addition, suppliers constantly invest less in revenue stream technologies with a declining share of 14% to 6% of all investments in 2015-17
OEMs and supplier compared

OEMs invest in mobility as a service and sales technologies whereas suppliers lead in investments in powertrain and autonomous driving

Invested Technologies per Acquirer (in % of total OEM/supplier deals, 2017)

<table>
<thead>
<tr>
<th>Process</th>
<th>Product</th>
<th>Revenue Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry 4.0</td>
<td>Connectivity</td>
<td>Mobility as a Service</td>
</tr>
<tr>
<td>Powertrain</td>
<td>Product Architecture</td>
<td>Sales</td>
</tr>
<tr>
<td>Autonomous Driving</td>
<td>Vehicle</td>
<td>After Sales</td>
</tr>
</tbody>
</table>

Commentary

- In 2017 technology driven M&A activities, a strong shift in investment and development focus by both OEMs and suppliers became apparent:
  1. OEMs do not invest in Industry 4.0 technologies, but leave the field to automotive suppliers with investments accounting for 7% of total deals
  2. In addition, suppliers attack OEMs in their core fields of product development and innovation: Investments in Powertrain and Autonomous Driving technologies represent 35% and 29% of all deals
  3. At the same time, OEMs focus to unlock new revenue streams with 29% and 14% of all investments made in Mobility as a Service and sales-related technologies respectively. However, no M&A activities by OEMs in relation to after-sales technologies were recorded
- Besides, one notable technology investment in flying vehicles by OEMs was made in 2017 (5%)

EY Point of View

- OEMs center their technology driven M&A efforts on exploring new revenue streams by investing in Mobility as a Service and sales-related technologies instead of focusing on product development, which is at the core of their traditional DNA
- Suppliers react quickly and shift their attention to Powertrain and Autonomous Driving technologies, filling the investment gap and thereby attacking OEMs in their core competencies
In Europe 2017, the most active countries France, United Kingdom and Germany are net acquirers — South Korea, Israel and USA are net sellers

Top 10 most overall M&A in 2017 (# of deals)

1. China ............................... 694
2. United States .......................... 690
3. Japan ..................................... 254
4. South Korea ............................. 220
5. France .................................... 202
6. Germany ................................. 193
7. Russian Fed. ............................... 138
8. United Kingdom .......................... 133
9. Unknown .................................. 129
10. India ....................................... 102

Top 10 technology investments in 2017 (# of deals)

1. China ..................................... 35
2. United States ............................. 23
3. Germany ................................... 16
4. France ...................................... 10
5-6. South Korea .............................. 8
5-6. United Kingdom .......................... 8
7. Japan ....................................... 7
8. Sweden ..................................... 3
9-10. Hong Kong ............................. 2
9-10. South Africa ............................ 2
9-10. Switzerland ............................... 2
9-10. Canada .................................. 2
9-10. Unknown ................................. 2
9-10. Italy ...................................... 2
9-10. Luxembourg ............................. 2

Commentary

> 5 of the top 7 most active nations were net buyers in 2017
> German companies sold primarily Powertrain businesses and invested in service-oriented and software-based products and solutions
> As a country, Israel was the most significant net seller, with a distinct emphasis on companies related to Autonomous Driving
In international M&A, Germany is a net acquirer with a strong focus on mobility as a service providers.

Outbound M&A from Germany to target country in 2017:

- **Bought**: ∑ 9
- **Sold**: ∑ 4

<table>
<thead>
<tr>
<th># Bought</th>
<th>Target technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Mobility as a Service</td>
</tr>
<tr>
<td>2</td>
<td>Connectivity</td>
</tr>
<tr>
<td>2</td>
<td>Autonomous Driving</td>
</tr>
<tr>
<td>1</td>
<td>Powertrain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># Sold</th>
<th>Target technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Powertrain</td>
</tr>
<tr>
<td>1</td>
<td>Connectivity</td>
</tr>
<tr>
<td>1</td>
<td>Industry 4.0</td>
</tr>
<tr>
<td>1</td>
<td>Powertrain</td>
</tr>
</tbody>
</table>

Commentary:
- In 2017, Germany was a net acquirer with a total of 9 outbound international deals vis-à-vis 4 inbound deals.
- No particular focus region has been identified, as the target countries show a wide spread.
- The majority of deals target Mobility as a Service technologies, followed by Connectivity and Autonomous Driving.
Appendix
Appendix/Automotive M&A in 2017

A search for Autonomous Driving technology is driving M&A activities in 2017, as deals for Connectivity technologies rebounds

Number of deals related to Autonomous Driving technologies

- Steering systems
- Sensors and cameras
- Semiconductors
- Navigation
- Lights
- Control systems
- Artificial intelligence

Number of deals related to Connectivity technologies

- Telecommunications
- Software (Apps, OS, cyber sec.)
- Smart city
- Entertainment
- Electrification
- Control systems
- Augmented reality

Commentary

- Several technologies drove the increase in M&A activities for Autonomous Driving:
  - Sensors and cameras lead the way in M&A activity for Autonomous Driving technology, with 12 deals in 2017
  - A new interest in smart lighting systems arose in 2017, as lighting systems develop to become a key technology in support of sensors
  - The strongest increase in deals involved semiconductors, from 2 deals recorded in 2016 to 6 deals in 2017
  - Navigation systems increased from 3 to 6 deals
  - Deals for Artificial Intelligence (A.I.) technology remains stable and robust, with 4 deals in 2017

Commentary

- After a weak year in 2016, deal activity for technologies in relation to Connectivity of Vehicles rebounds in 2017
- In particular deals for software applications have increased from just 2 in 2016 to 7 in 2017
- New technologies that appeared for the first time in 2017 are:
  - Technologies connecting vehicles to the smart city, with a total of 3 deals
  - Augmented reality technologies, with 1 deal in 2017
  - Entertainment systems, which were robust through the year 2016, appear stable for 2017
  - General telecommunications technologies decreased from 6 deals in 2016 to just 3 in 2017
Deals aimed at acquiring technologies for electric vehicles surge, as fuel economy and efficiency of contemporary engines fade out

Commentary

- The steep increase of deals aimed at acquiring technologies for Electric Vehicles in 2016 was followed by another strong year with 31 deals in 2017
- Alternative technologies for zero emission Powertrains, like Fuel Cell technology, is overall small but shows steady growth, as companies keep options open
- Deals aimed at Hybrid technologies are still increasing from 2 in 2016 to 3 in 2017, despite the strong deal-flow associated with Electric Vehicles technologies

Commentary

- Within the Electronic Vehicle technology sector, two core technologies play a particular role:
  - Battery technologies are still highly sought after, with 12 deals in 2017
  - Power electronics, including Electronic Engines, caught up with Battery technology with equally 12 deals in 2017
- Interestingly, acquisitions for Battery Charging infrastructure decreased from 5 in 2016 to only 2 deals in 2017, despite the move from Hybrid to Electric Vehicles
### Appendix/OEMs and suppliers compared

#### Invested Technologies – Details (Number of deals, 2017)

<table>
<thead>
<tr>
<th>Automotive Supplier</th>
<th>OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric vehicles</td>
<td>3</td>
</tr>
<tr>
<td>Fueltanks</td>
<td>3</td>
</tr>
<tr>
<td>Fuel economy/efficiency</td>
<td>3</td>
</tr>
<tr>
<td>Electronic systems</td>
<td>4</td>
</tr>
<tr>
<td>Sensors and cameras</td>
<td>4</td>
</tr>
<tr>
<td>Semiconductors</td>
<td>6</td>
</tr>
<tr>
<td>Wire harness</td>
<td>6</td>
</tr>
<tr>
<td>Hybrid engines</td>
<td>5</td>
</tr>
<tr>
<td>Autonomous Driving</td>
<td>12</td>
</tr>
<tr>
<td>Connectiviy</td>
<td>12</td>
</tr>
<tr>
<td>Mobility as a Service</td>
<td>6</td>
</tr>
<tr>
<td>Industry 4.0</td>
<td>4</td>
</tr>
<tr>
<td>Sales</td>
<td>3</td>
</tr>
<tr>
<td>Product Architecture</td>
<td>3</td>
</tr>
<tr>
<td>Parts ordering</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>

### Commentary

- Investments in Powertrain technologies show a reverse trend: While OEMs have historically been strong in Powertrain development and production, Automotive Suppliers push ahead with 28 (90%) technology investments in 2017.
- In the race to secure technologies to enable Autonomous Driving, suppliers dominate across all technologies, most notably in Sensors and Cameras (12 investments, 100%) and Control Systems (2 investments, 100%).
- In addition, suppliers strongly lead in the area of Industry 4.0 (8 investments, 100%) and automotive After Sales (3 investments, 100%) in attempts to secure additional revenue streams.
- With six out of a total of nine deals centered around Mobility as a Service technologies, OEMs aim to explore new secures of revenue to complement their traditional business: Investments in technologies enabling Shared Vehicles (4 investments, 66%), Taxi Service Providers (1 investment, 100%) or Vehicle Rental (1 investment, 50%) clearly indicate a changing focus of OEMs moving from product towards service.
## European companies lead the way in acquisitions in 2017, followed by Asian companies. US companies lagging behind

### Summary of Acquisitions

#### Most overall M&A from OEMs in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th># Deals in 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Daimler</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Renault</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Volkswagen Group</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Isuzu Motors</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Hyundai</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Toyota</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Great Wall</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Peugeot</td>
<td>3</td>
</tr>
<tr>
<td>9–10</td>
<td>Honda, Sanyang, Geely, Jaguar, Landrover, Nissan, General Motors</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Most technology investments from OEMs in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
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<tbody>
<tr>
<td>1</td>
<td>Daimler</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Volkswagen Group</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Jaguar Landrover</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Toyota</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Geely (incl. Volvo)</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>BorgWarner</td>
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<tr>
<td>7</td>
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<tr>
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<tr>
<td>9</td>
<td>General Motors</td>
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<tr>
<td>10</td>
<td>Peugeot</td>
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</table>

#### Most overall M&A from suppliers in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th># Deals in 2017</th>
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<tbody>
<tr>
<td>1</td>
<td>LKQ Corp</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Genuine Parts Co</td>
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</tr>
<tr>
<td>3</td>
<td>Key Safety Systems Inc</td>
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<tr>
<td>4</td>
<td>Peugeot</td>
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<tr>
<td>5</td>
<td>Pon Holdings BV</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Stahlgruber GmbH</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Alliance Automotive Group SAS</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Takata Corp-Business</td>
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<tr>
<td>9</td>
<td>Adam Opel AG</td>
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<td>10</td>
<td>Accell Group NV</td>
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#### Most technology investments from suppliers in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
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<tbody>
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<tr>
<td>4</td>
<td>Peugeot</td>
<td>5</td>
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<tr>
<td>5</td>
<td>Pon Holdings BV</td>
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<td>8</td>
<td>Takata Corp-Business</td>
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<td>9</td>
<td>Adam Opel AG</td>
<td>1</td>
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<td>10</td>
<td>Accell Group NV</td>
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</table>

### Top 5 largest overall transactions in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Acquirer</th>
<th>Target</th>
<th>Value ($mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LKQ Corp</td>
<td>Stahlgruber GmbH</td>
<td>2,089</td>
</tr>
<tr>
<td>2</td>
<td>Genuine Parts Co</td>
<td>Alliance Automotive Group SAS</td>
<td>2,000</td>
</tr>
<tr>
<td>3</td>
<td>Key Safety Systems Inc</td>
<td>Takata Corp-Business</td>
<td>1,573</td>
</tr>
<tr>
<td>4</td>
<td>Peugeot</td>
<td>Adam Opel AG</td>
<td>1,210</td>
</tr>
<tr>
<td>5</td>
<td>Pon Holdings BV</td>
<td>Accell Group NV</td>
<td>950</td>
</tr>
</tbody>
</table>

### Top 5 largest technology transactions in 2017

<table>
<thead>
<tr>
<th>Rank</th>
<th>Acquirer</th>
<th>Target</th>
<th>Value ($mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dongxu Optoelectronic Tech Co</td>
<td>Shanghai Sunlong Bus Co Ltd</td>
<td>490</td>
</tr>
<tr>
<td>2</td>
<td>Delphi Automotive PLC</td>
<td>nuTonomy Inc</td>
<td>450</td>
</tr>
<tr>
<td>3</td>
<td>Shenzhen Fenda Tech Co Ltd</td>
<td>Shenzhen Furtunta Tech Co Ltd</td>
<td>419</td>
</tr>
<tr>
<td>4</td>
<td>Porsche Zweite Beteiligung</td>
<td>PVT AG</td>
<td>338</td>
</tr>
<tr>
<td>5</td>
<td>Aotecar New Energy Tech Co Ltd</td>
<td>Jiangsu Highstar Battery</td>
<td>333</td>
</tr>
</tbody>
</table>
The majority of targets for German deals is domestic, with a focus on mobility as a service technologies

### Major target countries for German acquisitions

<table>
<thead>
<tr>
<th>Target country</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>8</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>USA</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>UK</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Israel</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Denmark</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Italy</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>China</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>U.A.E.</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Norway</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

### Major investors into Germany

<table>
<thead>
<tr>
<th>Investor country</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>8</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>France</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>USA</td>
<td>1</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>China</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>South Africa</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11</td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>

### Commentary

- Germany is a net buyer, acquiring more foreign companies
- The leading target country for German investors is United States, only overtaken by the sum of European countries
- The leading investor in Germany for 2017 is France, while US companies did not acquire any German targets since 2016
- For the first time since 2015, a Chinese company acquired a German automotive tech-company

### Technologies acquired by German firms

- **Product Architecture**: 15
- **Sales**: 12
- **Powertrain**: 6
- **Mobility as a Service**: 4
- **Industry 4.0**: 3
- **Connectivity**: 3
- **Autonomous Driving**: 3

### Technologies sold by German firms

- **Product Architecture**: 11
- **Smart Supply Chain**: 9
- **Vehicle**: 1
- **Sales**: 3
- **Powertrain**: 2
- **Mobility as a Service**: 2
- **Industry 4.0**: 1
- **Connectivity**: 1
- **Autonomous Driving**: 1

### Commentary

- New technologies for Mobility as a Service, Connectivity and Autonomous Driving are in high demand for German companies, while acquisitions for traditional technologies like Powertrain or Industry 4.0 are declining
- Targeted technologies in Germany are still traditional technologies like Powertrain or Industry 4.0, but increasingly new technologies like Mobility as a Service or Connectivity
Methodology

The source used for the data and charts in the study is Thomson ONE and the date range considered was January 2015 to December 2017. We have considered all acquisitions in which an automotive firm was either the target or acquirer. The deals were divided into three broad areas, namely technologies related to process improvements, technologies targeting new revenue streams and technologies for the final product. In total, 3,681 transactions were considered, of which 317 were determined to be technology driven and relevant for the study. We have used the rates from Thomson ONE, and no adjustments were done for the purpose of this study.

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