Zinnov Zones 2019

Automotive ER&D Services

December 2019

zinnov™ ZONES ER&D SERVICES

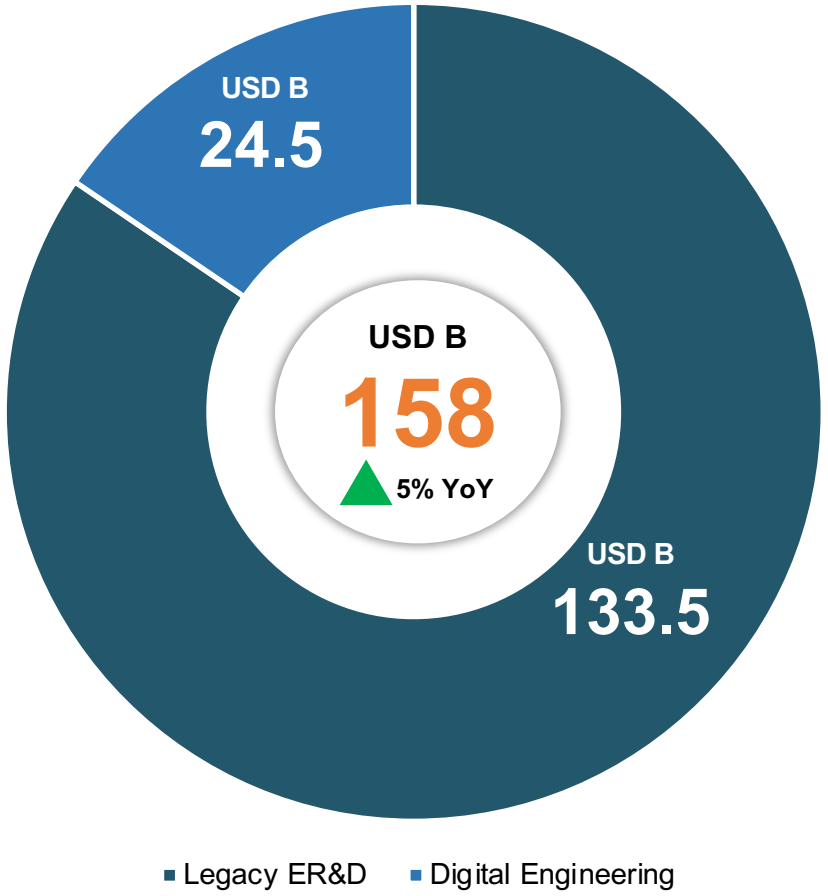
01	**Automotive ER&D Services Market Overview**
02	**Zinnov Zones Automotive micro-vertical ratings 2019**

- **Global Automotive ER&D Spend**
  - **Automotive ER&D Spend 2019**
  - **Automotive ER&D Spend by geography**
  - **Digital Engineering investments driving opportunities for SPs**

- Automotive Micro-verticals Ratings 2019
  - Advanced Driver Assistance and Security
  - Body Engineering
  - Cockpit Electronics
  - Electric Powertrain
  - Telematics

Automotive ER&D spending is growing with investments in Digital Engineering fuelled by increasing focus on new age technologies

Automotive ER&D Spend 2019



Key Takeaways

- Automotive ER&D spend grew by ~5% YoY to reach $ 158 B with Europe dominating the regional pie, accounting for ~50% of global ER&D spending followed by Japan with ~26% of global automotive ER&D spending
- Automotive OEMs and component manufacturers are increasing their R&D spend on digital engineering initiatives to build autonomous, ADAS, and industry 4.0 capabilities
- Evolving customer preferences has led to a shift in the R&D priorities of carmakers, attracting focus on the software layer to enable autonomous and ADAS capabilities with digital engineering investments driving growth in automotive ER&D spending
- Automotive ER&D spenders are focusing on investing in tech start-ups to leverage the first mover advantage
    - Ford and Volkswagen jointly investing in Argo AI, the autonomous vehicle platform company building autonomous driving and electrification capabilities
    - Toyota announced its investment in two Israel based start-ups: Cartica Ltd. and Moodify, enhancing Toyota's autonomous mobility offerings

Z1000 Automotive ER&D Spending is dominated by Top 10 Z1000 Automotive firms accounting for ~60% of the Z1000 Automotive ER&D Spend

Z1000 Automotive Revenue 2019

USD **3,043** B

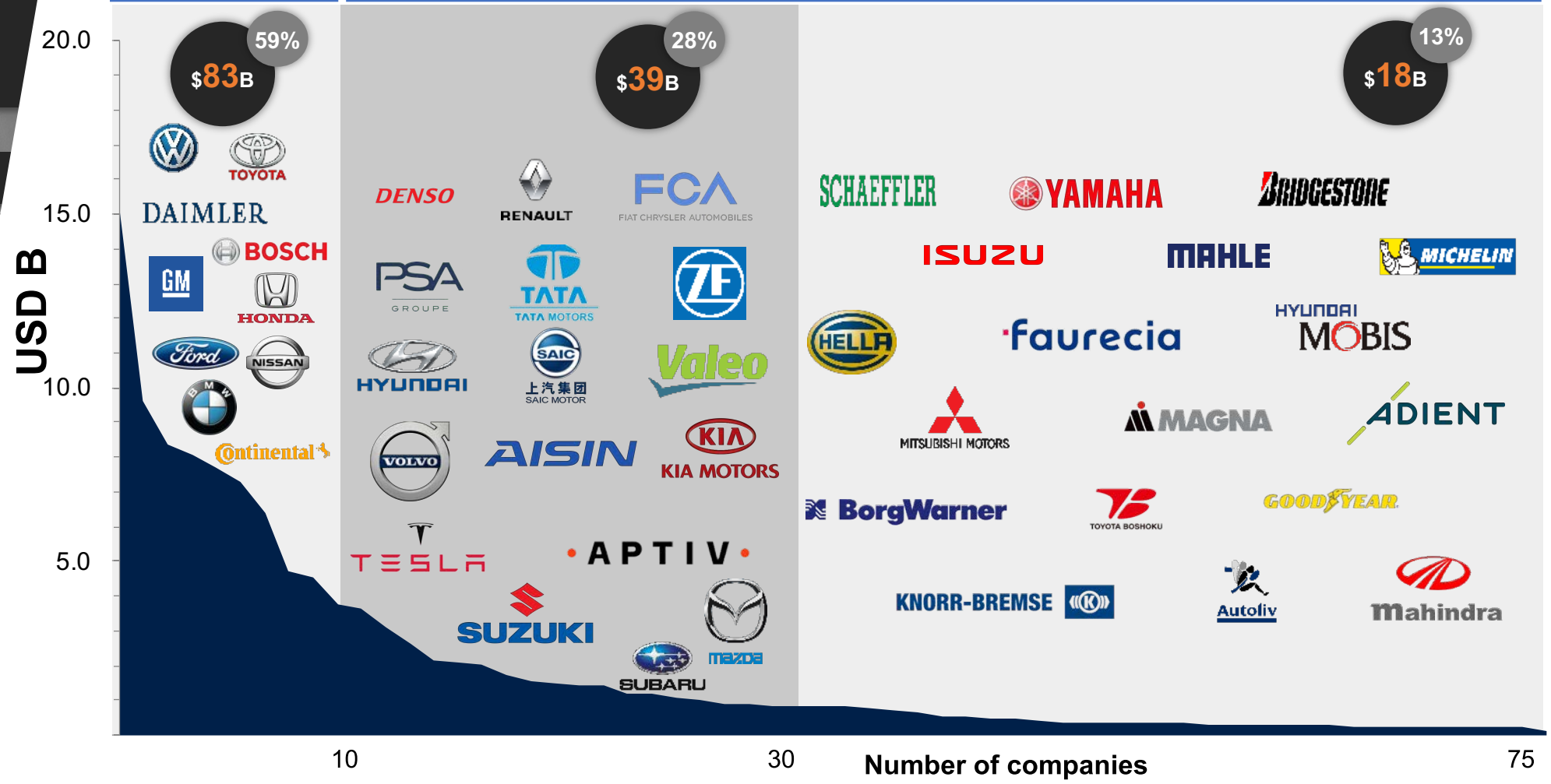
Z1000 Automotive R&D 2019

USD **139** B

Overall Automotive ER&D 2019

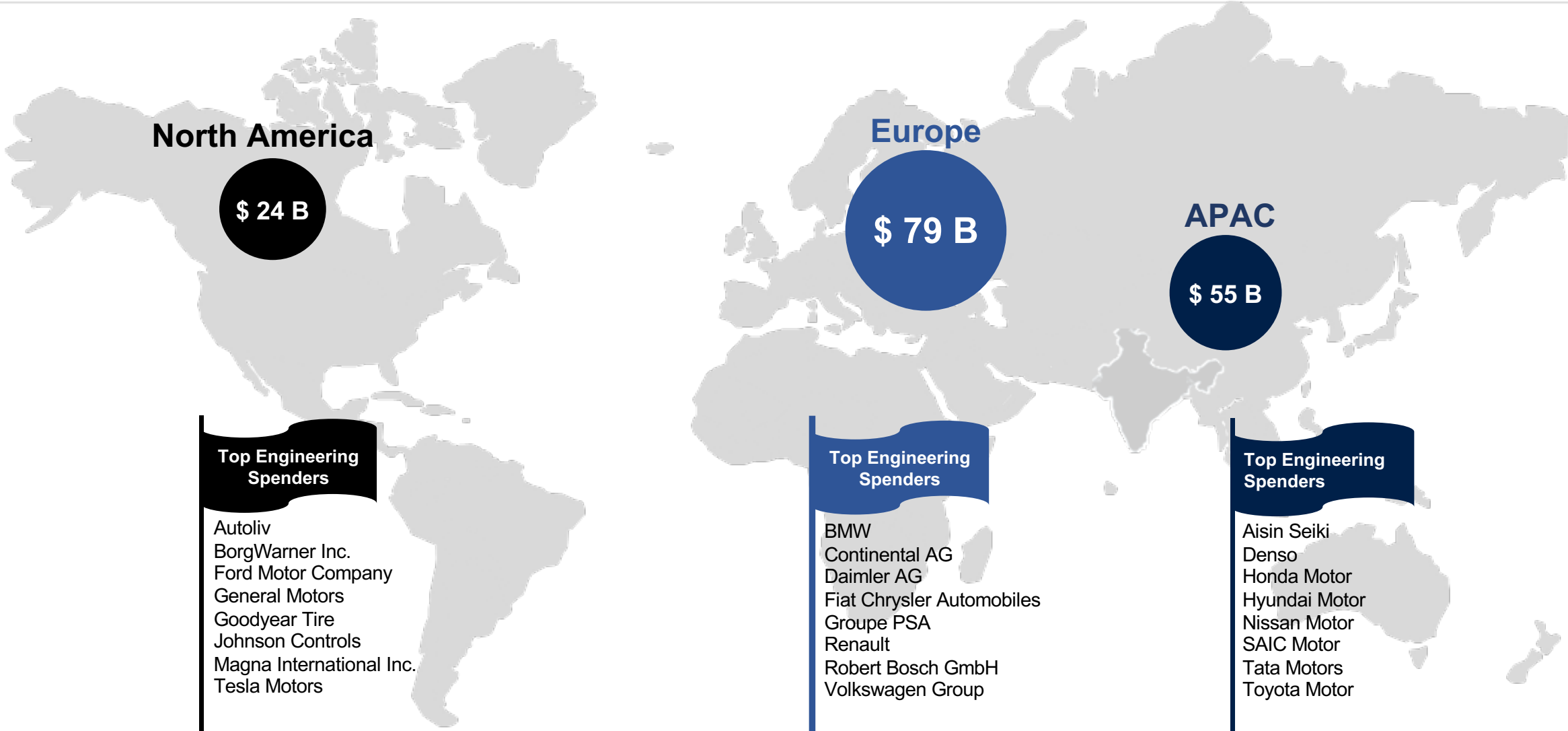
USD **158** B ▲ 5% YoY

- Top 10 Z1000 companies account for ~60% of the total Z1000 automotive ER&D spend
- ER&D spending by mid tier companies has grown at ~9% Y-O-Y as compared to overall ER&D growth of 4-5%



Source: Zinnov Research & Analysis

European Automotive Enterprises dominate the global ER&D Spend landscape



Top Engineering Spenders

Autoliv
BorgWarner Inc.
Ford Motor Company
General Motors
Goodyear Tire
Johnson Controls
Magna International Inc.
Tesla Motors

Top Engineering Spenders

BMW
Continental AG
Daimler AG
Fiat Chrysler Automobiles
Groupe PSA
Renault
Robert Bosch GmbH
Volkswagen Group

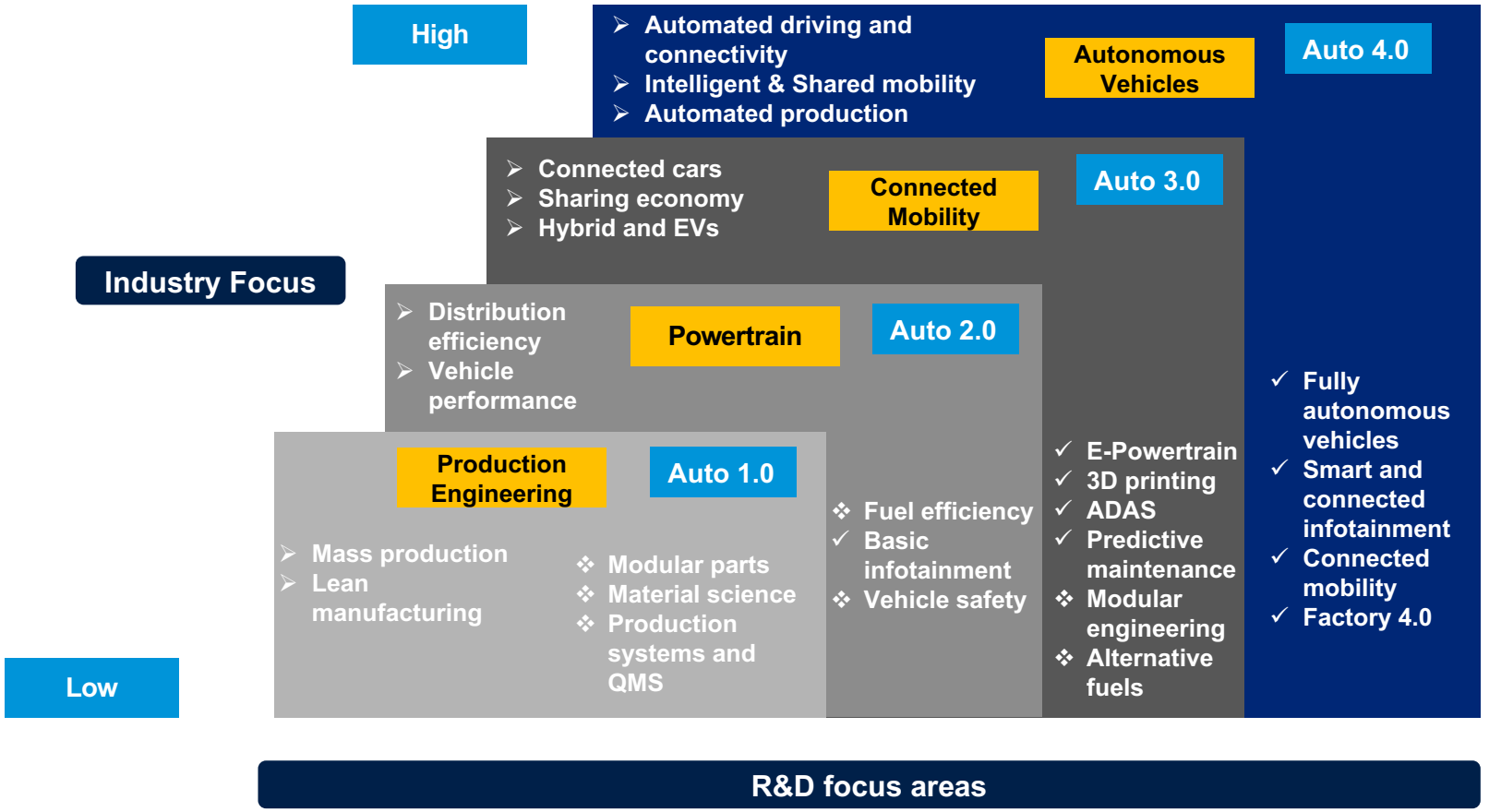
Top Engineering Spenders

Aisin Seiki
Denso
Honda Motor
Hyundai Motor
Nissan Motor
SAIC Motor
Tata Motors
Toyota Motor

R&D Spend (2019)

Digital engineering investments are driving growth in automotive ER&D Spending, creating newer opportunities for Service Providers

With increasing focus on new age engineering themes within Automotive, OEMs are prioritizing initiatives around autonomous vehicles and electric mobility



- The automotive industry has been impacted by trends such as mobility (shared ownership models, Mobility-as-a-service, etc.), need for enhanced safety and autonomous capabilities, and shift towards electrification of the power train
- Evolving customer preferences has led to a shift in the R&D priorities of carmakers with an enhanced focus on the software layer to enable autonomous and ADAS capabilities
- Digital Engineering initiatives are taking center stage attracting large investments around Automated driving & connectivity, Intelligent & Shared mobility and Industry 4.0, resulting in newer opportunities for service providers

Source: Zinnov Research & Analysis

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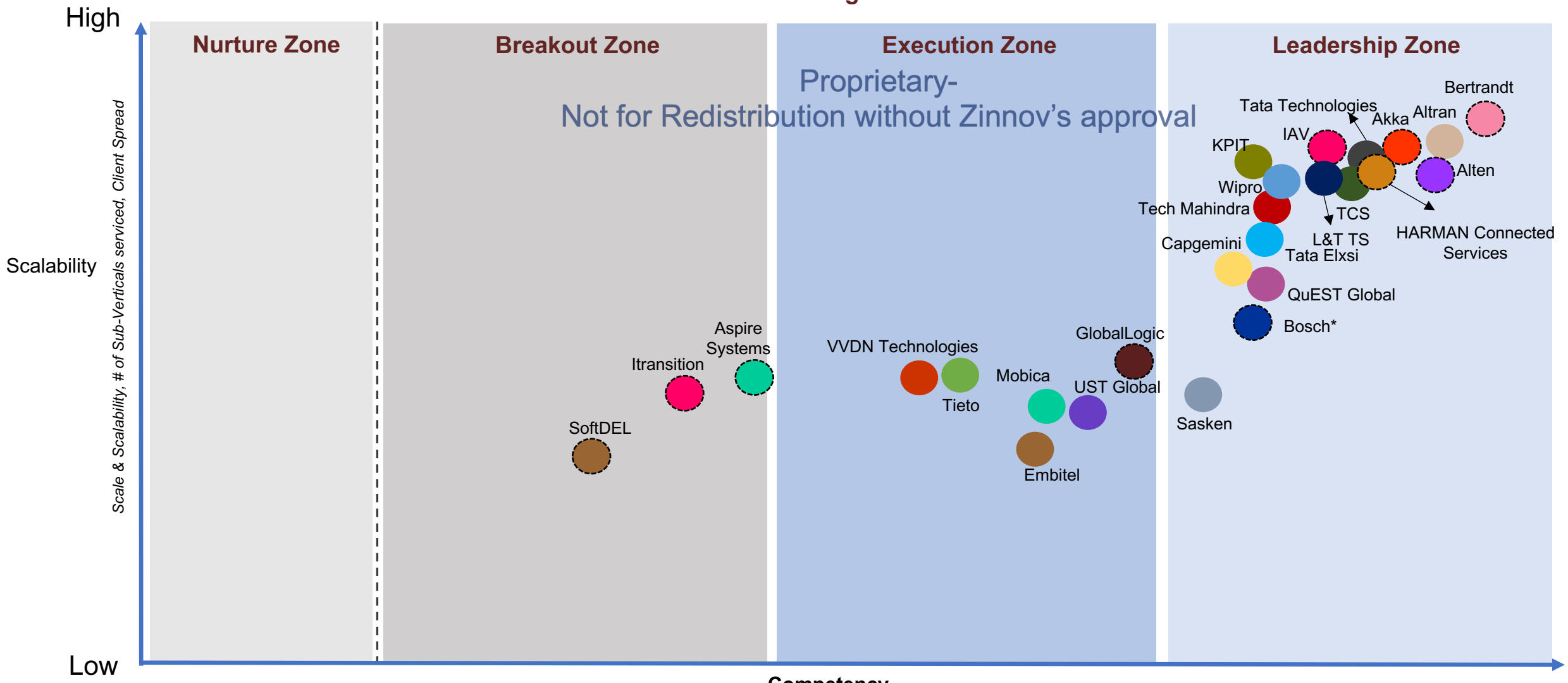
Automotive ER&D Ratings 2019

Zinnov Zones – Leading Service Providers*



*Robert Bosch Engineering and Business Solutions

Service providers with dotted lines have been evaluated based on Zinnov's analysis and understanding

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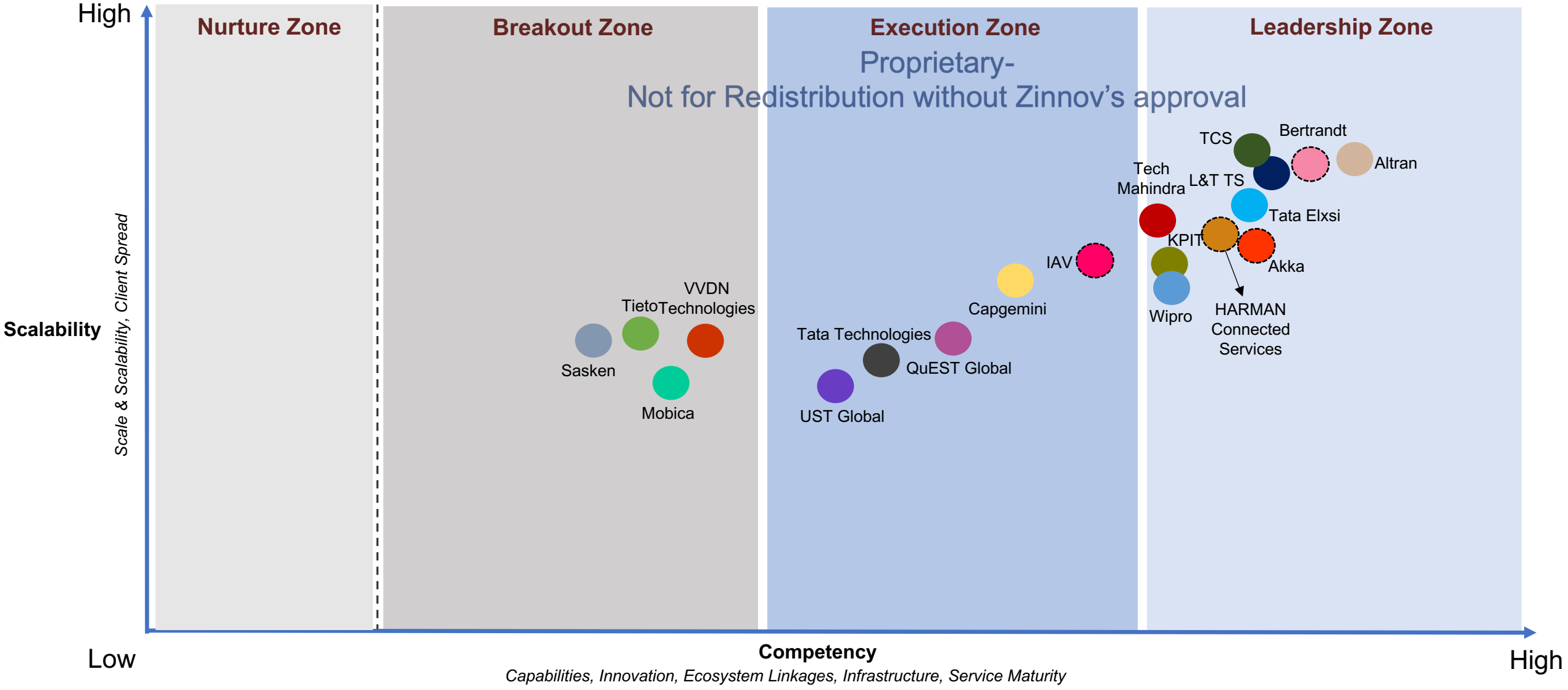
Automotive Micro-verticals : ADAS 2019

Advanced Driver Assistance Systems covers services pertaining to autonomous vehicles components, driver monitoring solutions, driver assist systems development, integration and development of sensors (Lidar, RADAR etc.), lane assist/control system development, and computer vision technologies

Zinnov Zones – Leading Service Providers



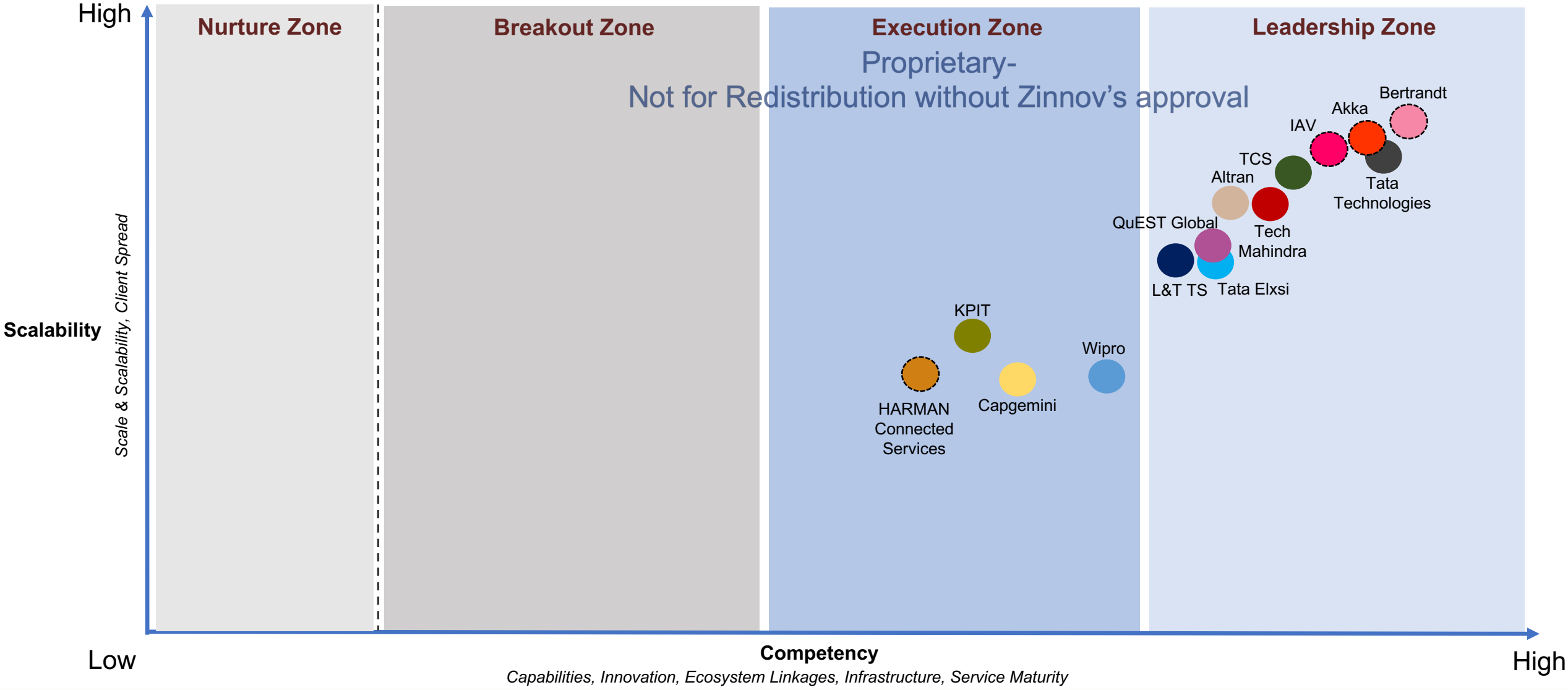
Source: Zinnov Research & Analysis

Service providers with dotted lines have been evaluated based on Zinnov's analysis and understanding

Automotive Micro-verticals : Body Engineering 2019

Body Engineering covers services pertaining to body styling, chassis engineering, BIW, functional design and development (including soft design as well as hard design), exterior and interior development and testing/V&V

Zinnov Zones – Leading Service Providers



Automotive Micro-verticals : Cockpit Electronics 2019

Cockpit Electronics covers services pertaining to in-car infotainment system, displays, instrument clusters, EPS, and other HMI technologies

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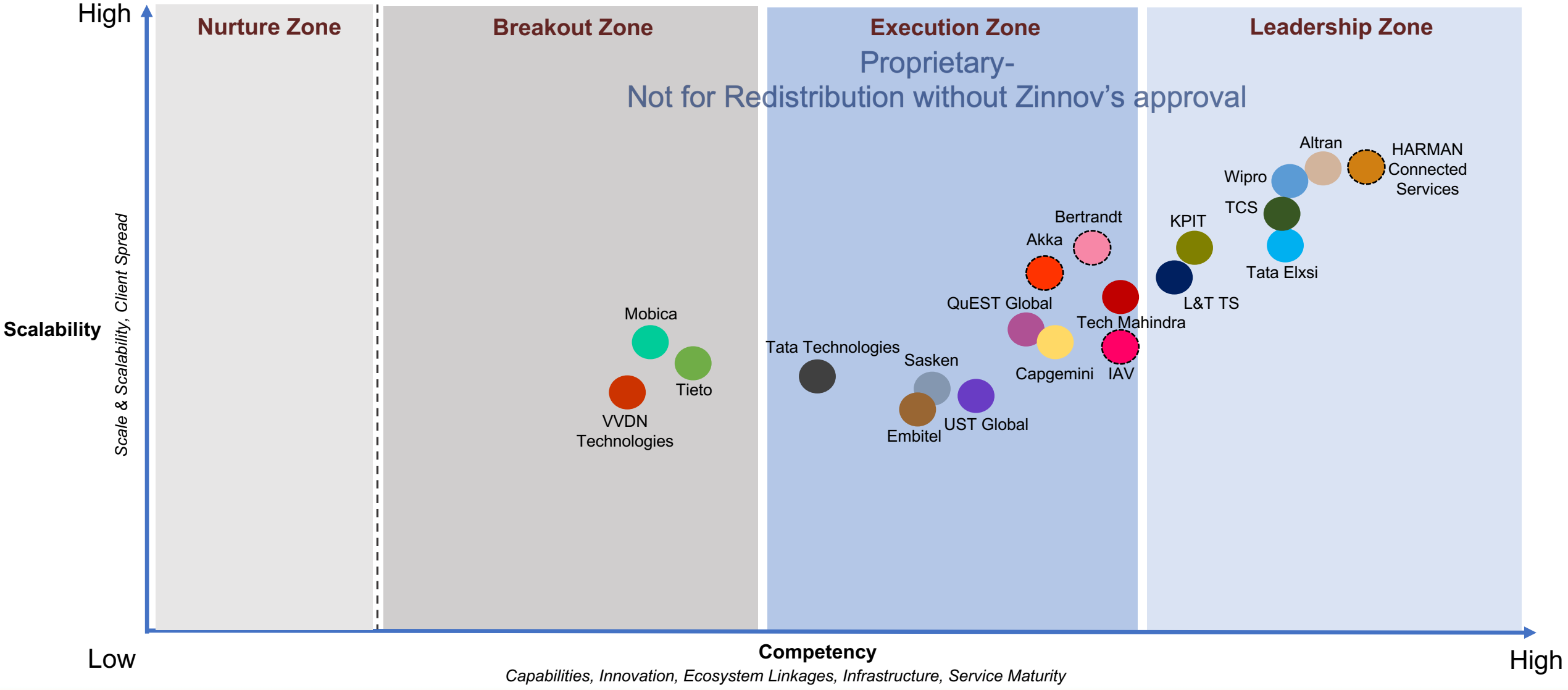

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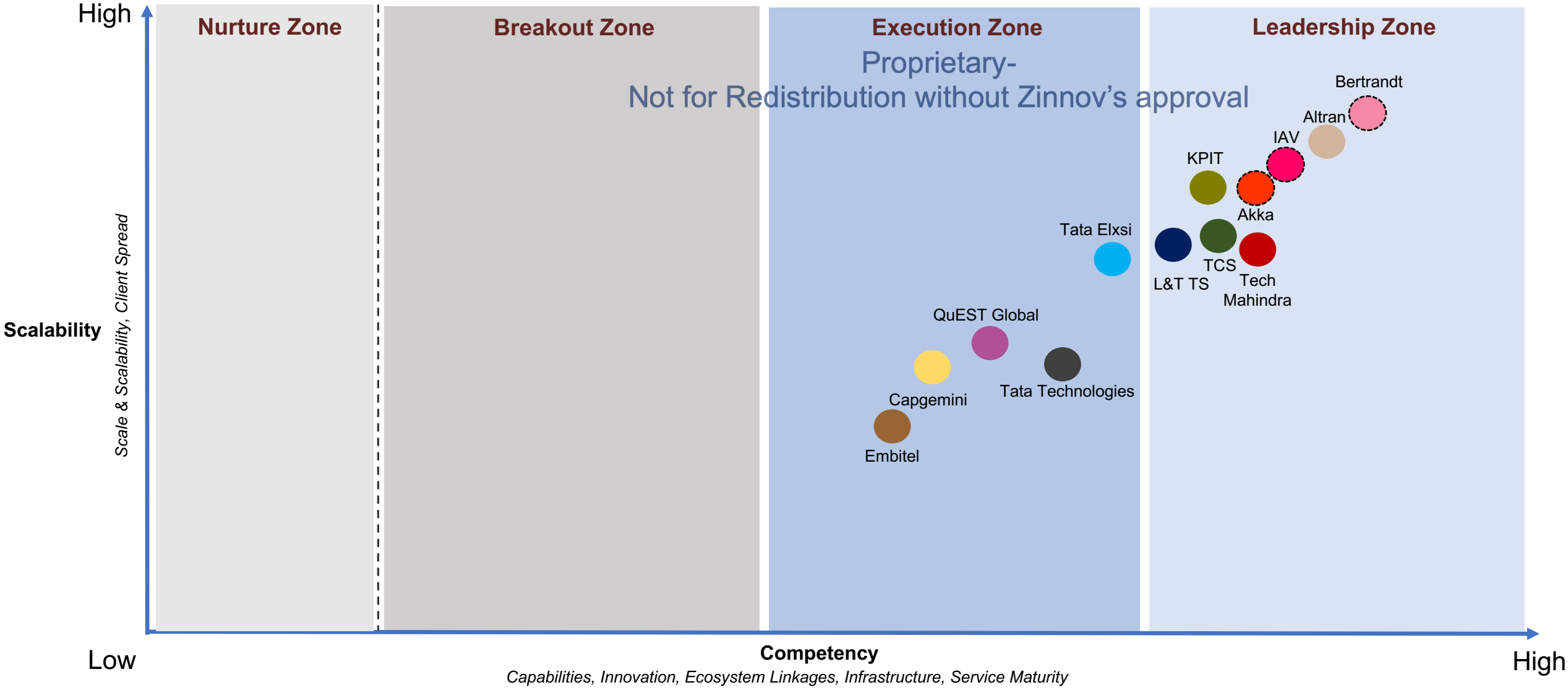
Automotive Micro-verticals : Electric Powertrain 2019

Electric Powertrain covers services pertaining to battery management systems, engine management systems, module development, on-board charging systems and development of other modules

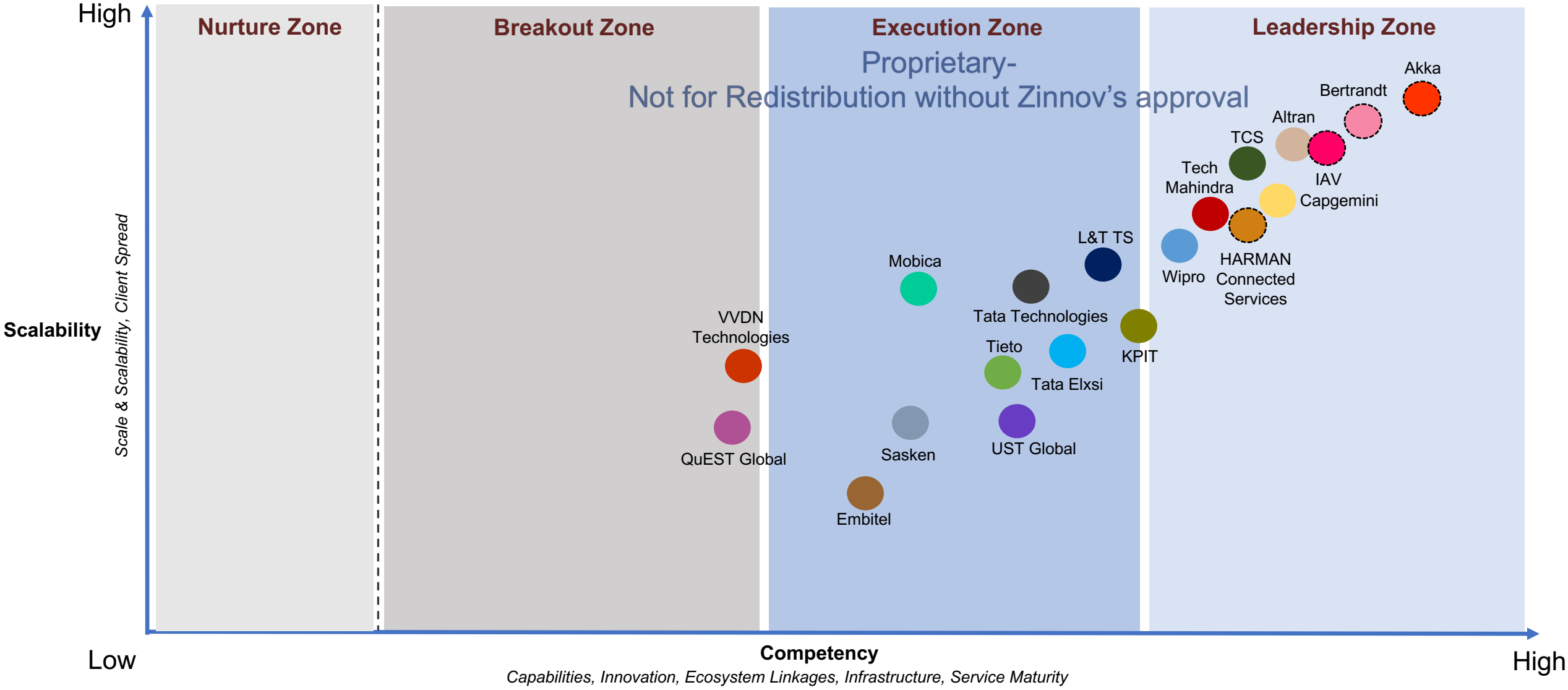
Zinnov Zones – Leading Service Providers



Automotive Micro-verticals : Telematics 2019

Telematics covers services pertaining to network & communication systems in V2V/V2X, cybersecurity, On-board diagnostics solutions, GPS navigation systems, and fleet management solutions

Zinnov Zones – Leading Service Providers



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