Rapidise's end-to-end automotive capability integrates design, electronics manufacturing, and edge-AI engineering through a vertically integrated, full-stack approach, allowing OEMs and Tier-1 suppliers to execute cutting-edge innovations from concept to commercialized product.

This comprehensive strategy is built upon Rapidise's foundation of **25+ years of Manufacturing Services Delivery** and **12+ years of Design Services Delivery**, positioning them as a strategic automotive technology partner.

1. Full-Stack Integration: Design, Electronics, and Mechanical Capabilities

Rapidise offers a "360-Degree Automotive Solution" that covers the complete product lifecycle, transforming the ODM landscape by seamlessly connecting design and manufacturing. The full-stack offering includes:

Component	Design and Engineering Services
Electronics (PCB + Hardware)	Includes **Automotive Grade PCB Design**, Hardware Architecture, Electrical Schematic Design, Multilayer PCB Layout Design, High-Speed Board Design, Analog & RF Design, and Component Selection & Bill Of Materials (BOM) Optimization.
Firmware (Embedded Software)	Covers Bare Metal, RTOS, Linux, and AOSP development. Specific services include **Firmware Development with Automotive Protocols (CAN, LIN & Ethernet)**, BSP, Device Driver development, Linux Kernel Customization, HAL, and FOTA (Firmware Over the Air). For example, they developed a custom control system for Heavy Duty Trucks based on NXP iMX8, using custom driver development for sensors like Temperature, Accelerometer, and Gyrometer.
Mechanical	Services include New ID concept generation, Product Design & Development, 3D Engineering, Reverse Engineering, Simulation and Analysis, and creation of Mechanical Design CAD Files.
Cloud	Rapidise provides Cloud Engineering expertise (AWS, Azure, GCP), IoT Dataflow Architecture, API Development and integration, Data Visualization, and Managed DevOps Services. These capabilities support vehicle telemetry and remote management solutions.

2. Edge-AI Engineering and Innovation

Rapidise specializes in **IoT and AI-driven product design and development**, offering solutions that leverage advanced algorithms for real-time in-vehicle processing and decision-making. Their AI development capabilities focus on **Edge Computing & AI**, Computer Vision, Algorithm Development, and Predictive Maintenance.

Key automotive AI domains include:

- **Advanced Driver Assistance Systems (ADAS):** They offer ADAS as a service, including ready-to-use computer vision AI algorithms that are hardware agnostic. Offerings include Forward-Collision Warning, Lane Keeping Assistance, Traffic-Sign Recognition, and Blind Spot Assist. They also handle **Automotive Camera Calibration and Quality tuning for Vision-based ADAS systems**.
- **Driver Monitoring Systems (DMS) and In-Cabin Intelligence:** DMS solutions monitor driver behavior for safety and comfort, detecting driver fatigue (eye blink/yawn), mobile phone usage, and tracking vital signs.
- **Digital Cockpit / IVI:** Digital Cockpit Solutions integrate advanced technologies like AI, machine learning, and computer vision to enable customized features such as gesture recognition, voice control, and personalized settings. Customized HMI/IVI solutions specifically incorporate **Edge AI for Voice and Vision**.
- **Edge AI Framework:** Rapidise offers a modular **Edge AI Framework for Automotive** used in Vehicle Telemetry solutions, which supports real-time tracking, fuel consumption monitoring, and optimized performance via edge computing.

3. Electronics Manufacturing, Certification, and NPI

Rapidise ensures innovations are rapidly brought to market through robust manufacturing and New Product Introduction (NPI) services:

Electronics Manufacturing

Rapidise leverages owned manufacturing and assembly lines. They operate **10 Electronics Manufacturing & PCBA Facilities**, including **18 SMT and 22 Full Product Assembly Lines**. Manufacturing services include:

- PCB Assembly (SMD, DIP, TH).
- Box Build & Full Product Assembly.

- Mold & Enclosure Manufacturing.
- Green Manufacturing and Component Supply Chain Management. Rapidise holds key automotive industry certifications, notably **IATF 16949**, along with ISO 9001 and ISO 14001.

New Product Introduction (NPI) and Certification

The NPI process is tightly integrated with the design phase, ensuring products meet stringent automotive standards through validation, testing, and certification.

- **Design for Manufacturing (DFM):** The product development life cycle explicitly includes DFM Prototype, DFM/DFA changes, and the creation of Final Manufacturable Design Files.
- **Validation and Testing:** Services cover **Hardware Validation and Testing**, which includes HIL testing, EMI/EMC compliance, and compliance with safety standards and regulations, such as **ISO 26262 safety certifications**.
- **Reliability Testing:** The Product Reliability Test Lab is equipped for extreme testing, including HALT/HAST tests, Electromagnetic Testing (EMI & EMC), ESD control, Thermal, Humidity, Insulation, Endurance & Ageing Testing, and specific **Vehicle Testing** using a Vehicle Cold Chamber and Chassis Dynamometer.
- **Final Delivery:** The NPI stage includes achieving necessary **Certifications**, managing the supply chain, optimizing BOM, and using Automated Test Jigs.

In essence, Rapidise acts as a full-stack factory and engineering house—combining the creative and complex work of hardware, software, and mechanical design (backed by 12 years of experience) with the industrial discipline of advanced electronics manufacturing (backed by 25 years of experience) and integrating cutting-edge Edge-AI solutions (like ADAS/DMS) directly into the electronic architecture, thereby providing OEMs and Tier-1s a single partner for technical innovation and swift commercialization.

This integration approach is much like a professional kitchen that handles everything from inventing a unique recipe (design and AI engineering), sourcing all the ingredients (supply chain and BOM optimization), cooking it perfectly (PCBA and full product assembly), and adhering to all health and safety regulations (testing and certification) before serving the final dish (NPI).