



**Huawei CASE (Connected, Autonomous,  
Shared, Electrified) Layout and Strategy  
Research Report, 2020**

**October 2020**

## STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

## REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

## METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

## INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

## Abstract

### **Research on Huawei's CASE (Connected, Autonomous, Shared, Electrified): Who is the main rival of Huawei in automotive engagement?**

Huawei showcased its automotive products at Beijing International Automotive Exhibition 2020 (Auto China 2020) held in Beijing from September 26 to October 5, 2020, where Huawei's ambition in CASE can be clearly seen.

It is generally believed that Bosch is to be the real competitor of Huawei's automotive involvement.

### **Huge gap between Huawei and Bosch in automotive business**

ResearchInChina singles out 41 CASE indicators and compares them to assess such players' CASE capabilities as Bosch, Huawei, Baidu, and Waymo.

		Bosch	Huawei	Baidu	Waymo
Basic Comparison	R&D Team	Automated driving 2,000+ Software engineers 30,000	Intelligent vehicle BU 4,000+	1,000+	2,000+
	R&D Team Score	5	4	3	3.5
	Intelligent Connectivity Ecosystem	3	4	5	2
	Experience in Mass Production	5	2	3	3
	Client (s)	5	2	2	1
	Smart Connected Road Test	2	1	3	5
	OS	2	5	4	4
	Support for AUTOSAR, etc.	5	3	3	
	Autonomous Driving Technologies	AI Cameras	5	3	
Radars		5	3		4
Lidars		3	3		5
Ultrasonic Sensors		5			
Sensor Chips		5			
HD Localization		5			
HD Map		3	3	5	5
AD Processor			4		4
AV DCU		5	4	4	4
AD Simulation		4	4	4	5
Chassis-by-Wire		5			
CVIS Solution		2	5	5	

		Bosch	Huawei	Baidu	Waymo
Cockpit and Telematics	T-Box	4	5		
	Gateway	5	3		
	Infotainment	5	2		
	OBU & RSU	3	5	3	
	Cloud Services	3	4	5	5
	Vehicle Diagnosis & OTA	5	3	3	3
	Cockpit DCU	5	4		
	Phone-Car Interconnection	3	5	4	4
	HUD	4	3		
	Display Technology	4	4		
	Intelligent Voice		3	5	4
	AD Solution	RoboTaxi Solution	3	2	4
AVP Solution		4	3	3	4
Intelligent Driving Truck		3	3.5	3	4
Intelligent Driving Bus		3	3	4	
Electrification Technology	BMS	5	4		4
	IGBT	5			
	Charging Technology	5	4		
	Motor Technology	5	4		
	E-CVT	5			
	SiC Power Devices	4			
	Fuel Cell	4			
Total Scores		161	114.5	75	82.5

Judging from final scores, Bosch in possession of 30,000 software engineers stays far ahead of other peers. Bosch is scheduled to lavish €4 billion into autonomous driving (AD) between 2019 and 2022, with the rising number of 2,000 AD engineers in 2019 to 4,000 ones till 2022. It is conceivable that Bosch as the leading CASE vendor will be hardly challenged within five years.

In respect of hardware, the top four emerging Chinese automakers select Bosch, and embrace BAT (Baidu, Alibaba, Tencent) as concerns software and application ecosystem.

The traditional OEMs like SAIC, Great Wall Motor, Geely and BYD have established own intelligent connectivity subsidiaries successively, attempting to develop core systems such as domain control unit (DCU), underlying layer and mid-layer software independently.

Actually, the traditional OEMs' engagement in the development of core systems makes Tier-1 suppliers (struggling to find a new position, and most of whom are in the red with gloomy prospects) ever less viable.

The traditional automakers are desperately seeking for a transition as competition pricks up. As long as a Tier-1 supplier makes a success in a case of product use for a carmaker, there will be an inrush of orders from other automakers. For instance, Desay SV's orders from Changan Automobile and Chery come of its multi-screen cockpit solution availability onto Leading Ideal ONE.

Although with a complete product matrix, Huawei's most products except T-Box, V2X and MDC platform have not been spawned yet. Huawei is painfully aware of a rather high threshold for access to the automotive sector, in readiness for no profits in six years.

## **Huawei has BAT (Baidu, Alibaba, and Tencent) as the realistic opponents**

Huawei is inferior to Bosch whatever customer relationship, technical accumulation, R&D input or experience in mass production. So, Huawei is still not competent enough to threaten Bosch.

Like BAT, Huawei is just a peripheral supplier for mainstream passenger car makers, with production cooperation still in cockpit and telematics.

Goosed by vibrant players like BAT, China stays two years or three ahead of foreign countries when it comes to cockpit and Internet of Vehicle (IoV) technology application. Based on this, Huawei and BAT are turning to be the suppliers of incremental components.

As the development route of cooperative vehicle infrastructure system (CVIS) prevails in China, there is a huge Chinese market of road side perception and decision systems for intelligent transportation and smart roads. It's just a matter of time to foray into vehicle with enough experience in roadside perception and decision since it hardly poses any threat to Bosch for the moment.

In this sense, Huawei has the realistic competitors in the recent years such as BAT and HikVision that are absorbed in cooperative vehicle infrastructure system (CVIS).

## **How will Huawei win out?**

By referring to rivalry in the process of featured phones to smart phones, the vast majority of startups and tier-2 suppliers in the intelligent connected vehicle (ICV) field will be predictably eliminated in cut-throat competition, and only three or five of them will survive and there will be an oligarch in the intelligent vehicle computing platform market then when components will be standardized, plug and play alongside a thriving software application ecosystem.

Huawei is ambitious to be an ultimate winner, with strides in autonomous driving integrators and commercial vehicle manufacturers already.

It is with the help of Huawei MDC platform that Momenta and HoloMatic developed HWP and AVP solutions for passenger cars; that CiDi (Changsha Intelligent Driving Institute Ltd.) developed intelligent heavy truck solutions; that Neolix developed self-driving delivery system; that DeepRoute.ai developed the solution for container trucks at ports; that i-Tage Technology Co., Ltd. and WAYTOUS developed autonomous mining truck solutions.

In early 2019, Yutong Bus signed a memorandum of understanding (MOU) with Huawei about building a bus automated driving computing platform by leveraging Huawei's MDC technologies and its automated driving technologies for buses.

In April 2019, FOTON joined forces with Huawei in developing commercial-scale intelligent driving computation platform for production models inclusive of heavy truck, medium truck, light truck, pickup, bus and van.

In May 2019, FAW Jiefang inked a deal with Huawei about joint efforts in 5G-enabled telematics, intelligent driving, rich communication suite (RCS), cloud services, among others.

In June 2019, JMC Group signed a strategic cooperation agreement with Huawei about collaborating on automotive electrification, intelligence, telematics and the technologies concerned.

In July 2020, Yutong Bus signed a contract with Huawei about joint efforts in fields like telematics platform development, intelligent driving, new energy, intelligent public transport and smart sanitation vehicle whilst pushing ahead with project implementations in a plurality of commercial vehicle scenarios.



Overall, Huawei's automotive business route is to first encroach on the peripheral markets and then encircle the key markets. Huawei helps the ecosystem partners massively use MDC platform and impress clients with the superiority of its computing platform and ecosystem to other computing platforms, offering air support from 5G and C-V2X technologies as well as governmental demonstration projects and '1+8+N' all-scenario strategy.

Huawei needs to succeed first in commercial vehicle and special vehicle fields and then acts as a full supporter for two to three Chinese passenger car makers (like BAIC Motor and BYD) from whom it makes handsome sales, with a possibility of access to the supply chain of influential passenger car makers. Only acceptance from the leading OEMs can Huawei MDC become one of the mainstream intelligent vehicle computing platforms on the Chinese market. This will take about five to eight years.

### **1 Huawei's Automotive Involvement**

- 1.1 Introduction to Huawei Technologies
- 1.2 Huawei Solutions for Intelligent Connected Vehicle (ICV)
- 1.3 Huawei's Strategic Planning for Intelligent Connected Vehicle (ICV)
- 1.4 Huawei's Intelligent Vehicle Product Layout and Partners
- 1.5 Huawei's Focus on Essential Elements of Digital Platform
- 1.6 Huawei Computation and Communication Architecture
- 1.7 CCA and Three Domain Control Platforms
- 1.8 Huawei Cross-domain Integration Software Architecture and Three Onboard Operating Systems
- 1.9 Huawei Vehicle Control OS
- 1.10 Huawei Intelligent Connected Vehicle (ICV) Partners
- 1.11 Huawei's Successful Applications in Automobile

### **2 Huawei's Efforts in Internet of Vehicle (IoV), Cloud Services and Cockpit**

- 2.1 Introduction to Hicar
- 2.2 Hicar 4S and Open Strategy
- 2.3 Hicar Screen Projection Solution Different from Connectivity 1.0
- 2.4 Hicar's Edges over CarPlay
- 2.5 Hicar Carrying
- 2.6 Automated Driving Cloud Services
- 2.7 HD Map and IoV Cloud Services
- 2.8 'Battery, Motor, Electric Control' Cloud Services and V2X Cloud Services

- 2.9 Huawei CDC Smart Cockpit Platform
- 2.10 Huawei 5G Smart Cockpit
- 2.11 Huawei 4.5G LTE-V Onboard Terminal
- 2.12 Huawei Ethernet Gateway
- 2.13 Huawei Infotainment Module and Smart Cockpit Development Platform
- 2.14 Huawei Ultralow Reflective Display Screen
- 2.15 Huawei Smart Cockpit HD Cameras and Cockpit Microphone Array Module

### **3 Huawei's Efforts in Autonomous Driving**

- 3.1 Huawei ADS Automated Driving Full Stack Solution
- 3.2 Huawei Automated Driving Path: Classified by Scenarios
- 3.3 Huawei MDC Automated Driving (AD) Computing Platform
  - 3.3.1 MDC Computing Platform Architecture
  - 3.3.2 MDC Software Platform
  - 3.3.3 MDC Platform Development Toolset
  - 3.3.4 MDC Hardware Platform
  - 3.3.5 MDC Hardware Platform: MDC600 & MDC300
  - 3.3.6 Scenarios Where MDC300 Gets Applied
  - 3.3.7 MDC Hardware Platform: MDC610 and MDC210
  - 3.3.8 MDC Core 2.0
- 3.4 Autonomous Driving Simulation Platform -- Octopus
  - 3.4.1 Octopus Availability in Xiangjiang New Area of Changsha City in Huanan

### 3.5 Huawei Layout in Perception Layer

#### 3.5.1 Huawei 77GHz Radar

#### 3.5.2 Huawei LiDAR 2.0

#### 3.5.3 Huawei 8M Forward Stereo Camera - Super Fisheye

#### 3.5.4 Huawei Millimeter-wave Imaging Radar

### 3.6 Huawei Commercial Vehicle Automated Driving

#### 3.6.1 To Empower Automation Scenarios for Commercial Vehicle and Special Vehicle

#### 3.6.2 Huawei Solutions for Commercial Vehicle

### 3.7 Summary of Huawei Autonomous Driving (AD) Business

## 4 Huawei V2X Business Layout

### 4.1 Introduction to Huawei V2X Business

#### 4.2 V2X Cooperative Vehicle Infrastructure System (CVIS) Products

#### 4.3 V2X Cooperative Vehicle Infrastructure System (CVIS) Product Planning

#### 4.4 Roadside CVIS Solutions

#### 4.5 Commercial C-V2X Solution RSU

#### 4.6 RSU 5201

#### 4.7 RSU 6201

#### 4.8 Huawei's Forecast of Global Intelligent Lamp Pole Market

#### 4.9 Huawei Communication Module and T-Box

##### 4.9.1 5G On-board Module MH5000

##### 4.9.2 5G Multimodal Terminal Chip Balong 5000

##### 4.9.3 Huawei T-Box Solution

##### 4.9.4 IoT Platform OceanConnect

##### 4.9.5 Application of Huawei T-Box

## 5 Huawei's Presence in Electrification

### 5.1 VDC Intelligent Electric Platform

### 5.2 Multi-into-one Electric Drive System -- DriveONE

### 5.3 Huawei Onboard Charging System

### 5.4 HUAWEI HiCharger

### 5.5 Electric Drive Product Roadmap

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