Global and China Leading Tier1 Suppliers' Intelligent Cockpit Business Research Report, 2020 (I)

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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

Leading Tier1 Suppliers' Cockpit Business Research Report: Eight Development Trends of Intelligent Cockpit

Abstract: in the next two or three years, a range of new intelligent cockpit technologies will be in place and mounted on vehicles, according to the Global and China Leading Tier1 Suppliers' Intelligent Cockpit Business Research Report.

High automation faces technical and regulation challenges and it takes a long period of time to build 5G network and roadside infrastructure. In this context, much enthusiasm for intelligent cockpit is being aroused before automated driving technology becomes mature enough. Intelligent cockpits featuring new design concept draw more attention from consumers than automated driving technology does.

Globally, OEMs and Tier1 suppliers are racing to explore how to launch new intelligent cockpit technologies. We expect that numerous intelligent cockpit products will be launched successively in the upcoming two years or three. Based on the picture at CES 2020, development trends for intelligent cockpit can be seen below:

(1) Cockpit domain control unit (DCU): next-generation intelligent cockpit systems are DCU-centric and enable features of cockpit electronic systems through a unified software and hardware platform, which incorporate intelligent interaction, intelligent scenarios and personalized services and serve as the foundation for human-vehicle interaction and V2X connectivity.

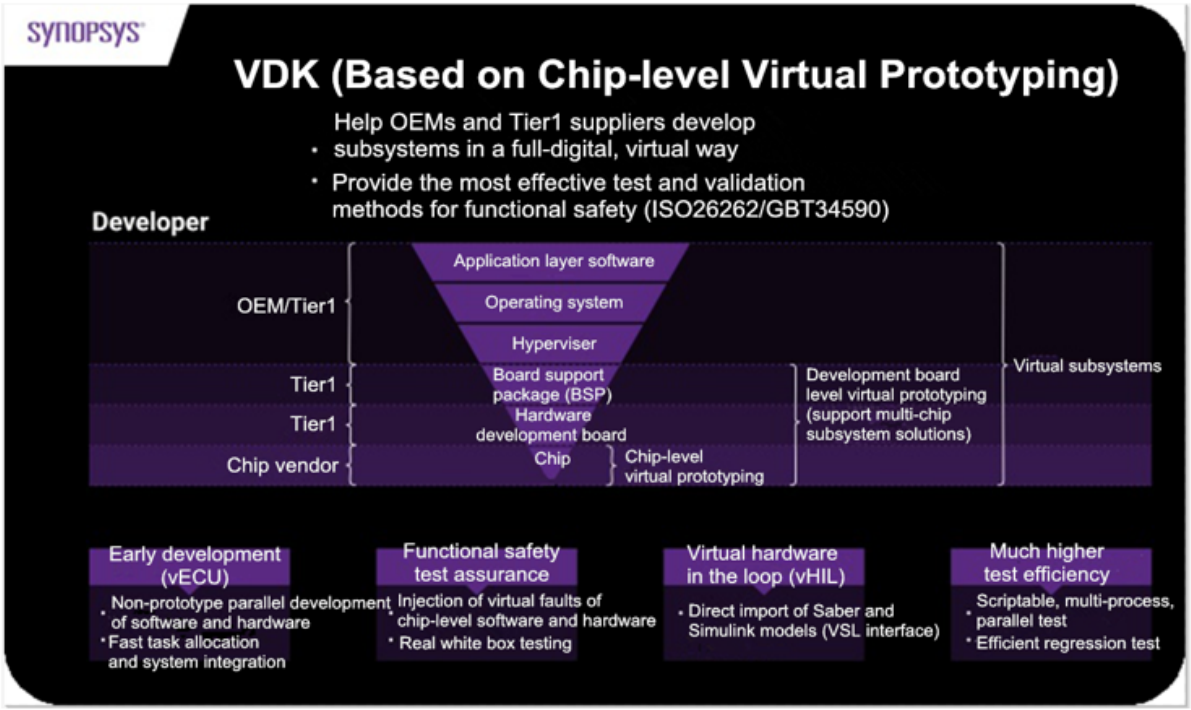
(2) Multi-display interaction: the cockpit design of dual-display interaction (center console, dashboard), four-display interaction (center console, dashboard, entertainment screen at the copilot's seat, vehicle control display), or even five-display interaction (center console, dashboard, entertainment screen at the copilot's seat, vehicle control display, rear seat entertainment display) is trending. Multi-display interaction needs complete cockpit domain architecture, and fusion of technologies, e.g., cockpit DCU, multi-chip (like TI automotive chips and Qualcomm entertainment chip), multiple operating systems (Linux, Android Automotive), Hypervisor virtualization technology, interaction logic, and HMI design. Tier1 suppliers are required to be more competent in product development and technology integration while seeking business growth amid the rising average selling price (ASP) of intelligent cockpit per vehicle.

Rising ASP of Visteon Integrated Cockpit Electronics per Vehicle

Source: Visteon

(3) Cockpit virtualization technology (separate development of software and hardware): virtual prototyping technology makes design, R&D and test of intelligent vehicles more efficient. Virtualizer Development Kit (VDK) based on virtual prototyping technology enables virtual simulation of electronic control units (ECU), e.g., chips, circuits and components. Automakers can commence development and test of software twelve months ahead of time before the availability of hardware, upgrading physical development to intelligent development in simulation environment. Also, ECUs for virtual simulation can accelerate and extend tests, and simulate various tests in extreme conditions, which is hard to achieve in real and physical circumstances and which secures faster roll-out of safer and more reliable products into market. The virtual prototyping technology is applicable to virtual development and test of all complex electronic systems such as intelligent cockpit and ADAS.

Virtualizer Development Kit (VDK) of Synopsys



Source: Synopsys

(4) Higher value of cockpit electronics software: the more complex vehicle system software means it makes up ever more of the total cost of a vehicle. OEMs and Tier1 suppliers are expanding software developers in R&D workforce. Examples include Desay SV, an intelligent cockpit bellwether in China, which boasted about 1,300 software engineers in 2019, a 70% share of its headcount; and Bosch in possession of 30,000 software talents, or 41% of the total staff in 2019 endeavoring to recruit more software developers. Between 2019 and 2020, Bosch set up Bosch China Innovation and Software R&D Center and Bosch Digital Cabin (Shanghai) R&D Center.

(5) Cockpit "terminal-cloud" integration, T-BOX and V2X as gateway of data from inside and outside vehicle, and cockpit big data as core competitive edge of products: intelligent cockpit will be a combination of terminals and cloud, in which all kinds of service contents, timely information sharing and complex computation will be offered and done over cloud, more than acts as a stand-alone terminal. In future cockpit big data will be the core competitive edge of products, making center console and dashboard, center information display (CID) navigation, T-BOX and air-conditioner controller, integrated.

(6) Evolution of vehicle display from flat rectangular screen to large curved screen: in January 2020, Corning's high-performance Gorilla cold-rolled glass was first available to GAC Aion LX; in early 2020, Visteon and Corning joined hands to further develop ColdForm technology which will be spawned by Corning for automotive curved display systems; in July 2020, Rightware under Thundersoft, and LG Electronics partnered to develop the industry's first curved OLED display for 2021 Cadillac Escalade.

(7) Glasses-free 3D display: 3D effect makes eyes capture information more quickly. Bosch, Continental and more all focus on mass production and installation of glasses-free 3D displays in the next two year or three. At CES 2020, Continental showcased its 3D Lightfield display technology which was co-developed with Leia Inc. and mass production is arranged in 2022.

(8) Driver monitoring system (DMS) or interior monitoring system (IMS): IMS based on camera and AI is the core product of Tier1 suppliers. DMS will play a crucial role in whether a new vehicle model can be rated five stars by Euro NCAP. For example, Continental plans to mass-produce DMS in 2021 and Bosch in 2022.

The Global and China Leading Tier1 Suppliers' Cockpit Business Research Report studies in depth strategies, technologies and products of leading Tier1 suppliers of intelligent cockpit, and highlights the following: (1) strategic plan and business layout of intelligent cockpit; (2) layout of intelligent cockpit technology centers, R&D centers and production bases; (3) intelligent cockpit product line, products and technical solutions, typical customers and vehicle models, mass production schedule, etc.; (4) intelligent cockpit product roadmap and development plan; (5) suppliers of intelligent cockpit products, technology and modules.

Comparison of Cockpit Solutions between Bosch and Continental

Research Content	Bosch	Continental
Cockpit DCU (chip)	Vehicle computer	Body electronic platform—IIP (Integrated Interior Platform)
Intelligent Head Unit (IVI/infotainment/Display)	mySPIN IVI system	NAC/RCC (navigation and car entertainment system, intelligent voice assistant solution)
Vehicle displays (center console, dashboard, HUD, etc.)	Full LCD instrument/curved instrument cluster Vehicle glasses-free 3D display Digital rearview mirror Intelligent cockpit multi-display interaction	C/W HUD, AR HUD Vehicle instrument Glasses-free 3D display (light field display) Curved AMOLED display
Integrated control panel (ICP)	Vehicle control display and NeoSense haptic feedback technology	Curved console display system Haptic Interaction Surface
T-BOX/C-V2X/5G	Hybrid connectivity control unit (CCU)	T-Box Intelligent antenna Integrated with 5G- hybrid-V2X solution
DMS&IMS cockpit monitoring system	AI-based DMS	Multi-camera system integrated with front facing and 360-degree visibility DMS, recognition algorithms-driven interior camera
Cockpit thermal management and battery management system (BMS)	Cloud-based BMS	BMS for 48V systems
Other cockpit modules (OTA, gateway, telematics security, telematics big data, etc.)	OTA/FOTA solution	EB tresos vehicle basic software products OTA solution --EB cadian Sync, intelligent network gateway

The Global and China Leading Tier1 Suppliers' Cockpit Business Research Report has two parts, of which:
Part 1 with 320 pages in total covers 6 Tier1 suppliers, i.e., Bosch, Continental, Denso, Valeo, Faurecia and Panasonic.
Part 2 with 350 pages in total covers 7 Tier1 suppliers, i.e., Aptiv, Visteon, LG Electronics, Hella, Samsung Harman, Desay SV and Joyson Electronics.

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