Connected-Car related Market in Japan: Key Research Findings 2017

◆ **Research Outline**

Yano Research Institute has conducted a study on the domestic connected-car related market with the following conditions:

1. Research period: May to October, 2017

2. Research targets: Domestic and overseas automakers (OEM), Manufacturers of car electronics, IT/telecommunication businesses, vendors of cloud, electronic parts, and maps, security service providers, non-life insurance companies, and consultants

3. Research methodologies: Face-to-face interviews, surveys via telephone/email, and literature research

What is a Connected Car?

Connected cars are those systems and applications that provide improved comfort and safety of the car by being available to access Internet to accept the various services not only through in-car sensor network but also by being connected to cloud.

◆ **Key Findings**

■ **Size of Domestic Connected-Car related Market Attained 398.0 Billion Yen in 2016**

Connected cars have changed to those systems that acquire travelling information of the car through sensors and the like, and the information of which is collected and analyzed through cloud. The domestic connected car market size in 2016 is estimated to have achieved 398.0 billion yen in total, the specifics of which are B2C market 71.2 billion yen, B2B market 185.0 billion yen, and R&D cost 141.8 billion yen.

■ **Connected-Car related Market Expected to Leap Forward in Areas of "B2B" and "R&D Investment"**

Connected cars used to have been considered to fall into the category of infotainment services pertaining to car navigation systems. In fact, connected cars have rather become mainly to such systems that collect and analyze travelling data of vehicles in order to respond to the demand in the era of autonomous cars and EVs. Therefore, the connected-car market has largely been expanding in the field of B2B and investment in R&D, which is difficult for consumers to notice.

■ **Domestic Connected-Car related Market Projected to Attain 2 Trillion Yen by 2025**

Because of growing new services and investment in R&D, the domestic connected-car related market is likely to expand to as large as a trillion yen by 2020. The market is projected to grow further by 2025 to almost twice the size of 2020 to 2 trillion yen, due to increasing number of connected cars and to wider acceptance of those services that use probe information or cloud ADAS.

◆ Report Format:

Published report: "Forecast of Connected Cars Market for Passenger Cars for 2025 – 2017 Analysis Vol 1"
Issued on: November 9, 2017
Language: Japanese
Format: 301 pages in A4 format
Price: 180,000 yen (The consumption tax shall additionally be charged for the sales in Japan.)
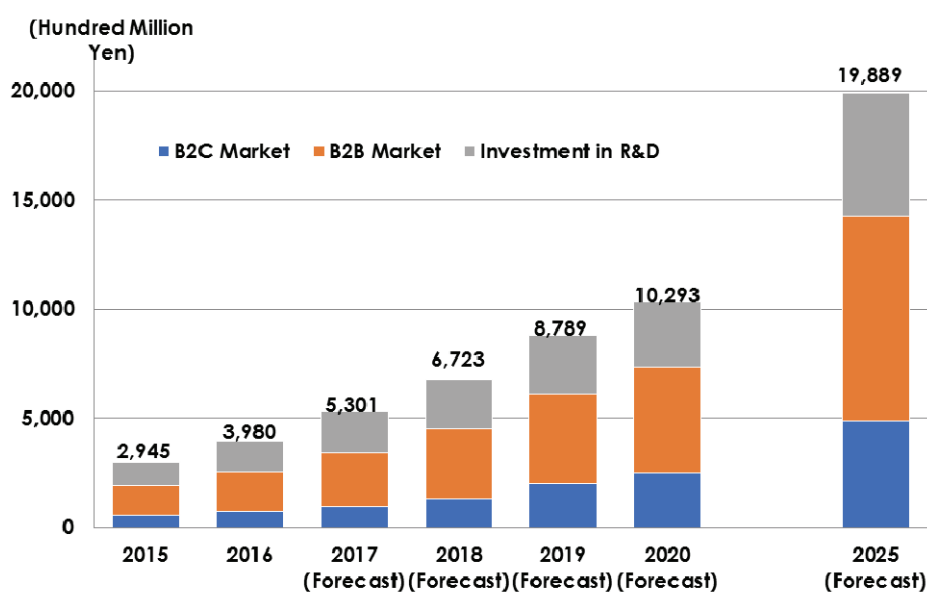
■ Figure & Table 1: Transition and Forecast of Domestic Connected Car Market Size

Estimated by Yano Research Institute

(Unit: Hundred Million Yen)

		2015	2016	2017 (Forecast)	2018 (Forecast)	2019 (Forecast)	2020 (Forecast)	2025 (Forecast)
B2C Market		532	712	956	1,320	2,007	2,495	4,870
	Y-o-Y	-	133.8%	134.3%	138.1%	152.0%	124.3%	195.2%
	Ratio	18.1%	17.9%	18.0%	19.6%	22.8%	24.2%	24.5%
B2B Market		1,375	1,850	2,440	3,196	4,092	4,844	9,360
	Y-o-Y	-	134.5%	131.9%	131.0%	128.0%	118.4%	193.2%
	Ratio	46.7%	46.5%	46.0%	47.5%	46.6%	47.1%	47.1%
Investment in R&D		1,038	1,418	1,906	2,206	2,690	2,955	5,660
	Y-o-Y	-	136.5%	134.4%	115.8%	121.9%	109.9%	191.5%
	Ratio	35.3%	35.6%	35.9%	32.8%	30.6%	28.7%	28.5%
Total		2,945	3,980	5,301	6,723	8,789	10,293	19,889

Estimated by Yano Research Institute

Notes:
1. The values in 2017 and beyond are forecast values. The Y-o-Y values of 2025 are the rate compared with 2020.
2. Sizes of the B2C market and B2B market are calculated based on the sales of businesses, and the size of investment in R&D is calculated based on the invested amount to OEM, etc.
3. The values in the table have been rounded, so that some totals and ratio within the table may not match.

■ Table 2: Overview of 16 Categories within Domestic Connected-Car Related Market

No.	Category	Descriptions
1	Probe Information	Probe data is the data of GPS-installed vehicles, i.e., location (latitude/longitude), speed, vehicle ID, time, and etc., acquired by sensors, etc. The data then be collected and analyzed through cloud, after which can be used as a part of traffic information such as prediction of traffic jams, information on EV charging, and etc.
2	Cloud ADAS (Advanced Driver Assistance System)	ADAS information is uploaded on cloud, after which provides the useful information to the vehicle such as optimized judgement and on operation by using AI, in order to assist safety driving which takes account of the driving conditions of that day and of the habit of the driver. The system is said to contribute to shared cars that are used by many unspecified people.
3	Cloud HMI	The in-car information (i.e., Driver IDs and his/her health conditions, number of people on borard, their positions within the car, and the driving time since the current driver started driving, etc.,) collected by means of HMI (Human Machine Interface) and other systems, which are monitored and collected to cloud in order to prepare for rapid change in the driver's health conditions or to prevent the driver from dozing off, leading to assist safe driving.
4	Cloud for Automatic Driving	In Level 4 automatic driving that can respond to aging people in underpopulated areas, the information acquired by V2X （Vehicle to Everything, including V2V or Vehicle-to-Vehicle, and V2I or Vehicle-to-roadside-Infrastructure) and collected through cloud enables to prevent accidents such as collision of vehilces at a blind corner. There are additional functions such as detection of stolen vehicles, alleviating disturbance of traffic to let an emergency vehicle to pass through, and warning at the time of abnormal weathers.
5	Community Maps	Information on vehicles driving ahead (i.e., location, speed, road surface, etc.) and on traffic jam sent from infrastructure is uploaded on cloud, after which is provided to each vehicle in real time, faster than current available time period.
6	Dynamic Maps	3D maps created based on the vehicle traveling information (i.e., location, speed, image data, etc.) acquired from the vehicle sensors are to be uploaded to cloud. In addition, a dinamic map (HD-MAP), further accurate and real-time, created from those 3D maps generated by multiple vehicles replaces the map data on cloud. 3D maps that provide highly-accurate 3D data are essential in automatic driving because automatic driving needs to recognize the location of and peripheral information surrounding each of the vehicle in order to control vehicles appropriately.
7	Telematics	Telematic Services are provided by means of car navigation systems, DA (display audios), and etc. In the field of driving assistance, when a map in a car navigation system is newly updated, the data on the updated parts of the map are sent to replace the older parts installed on the car navigation system. As for infotainment services, downloading of video animation streaming or radio over IP are used to update the maps, and for those in SNS, bilateral data communications are used.
8	Car Navigation Systems with Communication Functions	Communication functions equipped within car navigation systems that use telematic-services
9	DA Systems with Communication Functions	Communication functions equipped within DA (Display Audio) systems that use telematic services
10	Telelmatics Car Insurance	Automobile insurance that specify the premium according to how the driver controls/operates/drives the vehicle by successively acquiring his/her driving information (i.e., how appropriately the driver drives the car, number of times the driver jump starts, or slams on the brakes, though managing to prevent accidents.)
11	OTA	Currently, duration of services of automobiles is more than 10 years. When software is updated, in-vehicle programs must be updated using remote update through LTE. If OTA (Over the Air: Remote update of in-vehicle programs) becomes available, software recall and local-based differentiation of vehicles will be available, too.
12	Emergency Call Systems	Emegency call systems (e-call, etc.) widely introduced in Europe are structured to automatically notice emergency call center when vehicles crush. All new vehicles to be sold in Europe in 2018 and later are likely to have communication systems installed.

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13	V2X, blockchain Technologies	V2X（Vehicle to Everything, including V2V or Vehicle-to-Vehicle, and V2I or Vehicle-to-roadside-Infrastructure) have a structure to build communication networks between vehicle to vehicle, vehicle of your own and some others including other vehicles, pedestrians, infrastructure, and etc. In addition, those functions that enable to collect, analyze, and provide driving information of vehicles using blockchain technologies are attracting interest as useful methods for the future.
14	Communication Unit for Connected Cars, etc.	The increased parts of the price (value-added parts) of a connected car. To be precise, such added parts are: TCU (Telematics Communication Unit) and its in-vehicle computer system that aligns with cloud in the backgroud .
15	Integrated Cockpits	One of the characteristics of integrated cockpits (next-generation e-cockpits) is that such cockpit systems can be made into platforms, so that various applications can be used on the cockpits. It means, at the same time, that such cockpits can be opened. R&D expenses of integrated cockpits are included.
16	Virtual Cockpits	Virtual cockpits are those cockpits or consoles located at a certain space close to a driver's seat and are displayed through virtual view. The difference from integrated cockpits are that virtual ones do not need fixed display devices so that the vehicles can be controled from backseats or passenger's seats, i.e., seats that are not the driver' seats, and from remote areas. R&D expenses of virtual cockpits are included.

Estimated by Yano Research Institute

Reference:
"Global e-Cockpit Market: Key Research Findings 2016" released on January 23, 2017
"Automotive Software Market in Japan: Key Research Findings 2017" released on June 19, 2017