Automotive High-precision Positioning Research Report, 2019-2020

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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

High-precision Positioning Research: Competition from Chips, Terminals to Ground-based Augmentation Stations

Autonomous driving prompts the use of high-precision positioning technology in the realm of automobile where L3 autonomous driving requires decimeter-level accuracy and L4 or above centimeter precision.

Apart from the vehicle's own sensors for precise positioning, a high-precision positioning system outside the vehicle is also indispensable. For ground roads, a high-precision positioning system centering on 5G + BeiDou (or GPS) satellite + ground-based augmentation system is beginning to take shape; for parking lots, there may arise a V2X-centric (or UWB) high-precision positioning system.

The high-precision positioning infrastructure is not in place yet, the user base is still small, and the equipment is priced at least RMB10,000. Beijing Xilang Technology, for example, provides the products with a price range from thousands of yuan to more than RMB30,000, for autonomous buses, AGVs, smart agricultural machinery, inspection robots, etc.

The high-precision positioning solution launched by Qianxun SI in 2019 for low-speed autonomous driving integrates "services, hardware, and algorithms", reducing the cost of high-precision positioning equipment to thousands of yuan. The solution has been found in the products of low-speed autonomous driving companies like Neolix, Trunk, Cainiao, etc. The cost reduction of high-precision positioning terminal also hinges on mass production. OEMs hope that positioning infrastructure will be built as soon as possible, which is facilitated by the new infrastructure projects under way in China.

Competition in Ground-based Augmentation Stations

China will launch in June 2020 the last satellite for Beidou-3 Navigation Satellite System, an array of 30 satellites that will provide services to global users, which will offer development opportunities for the high-precision positioning market based on BeiDou.

Since its inception in August 2015, Qianxun SI has deployed more than 2,500 ground-based augmentation stations across China. Its FindAUTO spatio-temporal engines can be spawned for automotive use and in readiness for L2.5 autopilot on expressways and L3 high-speed autonomous driving. In 2020, there will be six production models of carmakers with FindAUTO in the market.

In October 2019, China Mobile purchased 4,400 sets of base station equipment for HAP (high-precision satellite positioning base station), with a total budget of RMB336.11 million or so.

Sixents Technology, backed by China Telecom, Tencent and NavInfo, plans to build 2,000+ ground-based augmentation stations nationwide with China Telecom's base station resources, core network resources and all-weather operation and maintenance systems.

In addition to Qianxun SI, Sixents Technology and China Mobile, GeeSpace invested by Geely, Starcart in the communications industry, Hi-Target, Huace, UniStrong and State Grid Shenwang LBS (Beijing) from the traditional surveying and mapping field also deploy ground-based augmentation systems.

State Grid Corporation of China is also striving to construct a nationwide electric power BeiDou ground-based augmentation system which is undertaken by State Grid Shenwang LBS (Beijing). As scheduled, State Grid will build 1,200 BeiDou (high-precision satellite positioning) base stations in its 27 provincial subsidiaries by leveraging its infrastructure nationwide.

For parking lot positioning, UWB technology provider Kunchen has successively signed contracts with Huawei, Desay SV, Qianxun SI, etc., targeting to cover more parking lots with UWB base stations.

Competition in Positioning Chips and Modules

In May 2019, Beijing BDStar Navigation developed Nebulas-IV, a 22nm positioning chip for automotive use.

In September 2019, Quectel, Qianxun SI and STMicroelectronics jointly released LG69T, a dual-frequency high-precision satellite and inertial navigation fusion positioning module for automotive use.

At the end of 2019, Jingwei Technology, a UWB positioning chip maker announced it raised tens of millions of yuan in Series A financing.

In February 2020, Qorvo announced the acquisition of Decawave, a UWB chip maker.

The BY682 board developed by BYNAV provides high-precision RTK services under good satellite signals and enables GNSS/INS integrated navigation through working together with Analog Devices Inc.'s ADIS16465 MEMS IMU.

High-precision Positioning Is Increasingly Used in Vehicles

With the maturity of technology, high-precision positioning finds more application in vehicles. Besides the vertical industries such as autonomous agricultural machinery, autonomous mining, driverless sweeping vehicle, etc., high-precision positioning systems are pre-installed in passenger cars like Cadillac CT6, SAIC Roewe Marvel X, and Xpeng P7.

High-precision Positioning Solutions of Some Autonomous Vehicles

Autonomous Driving System	High-precision Positioning Technology Solution	Sensor Configuration
Zoomlion	Vision + BeiDou Navigation +angle sensor +IMU	An angle sensor +3 stereo cameras
Lovol	Vision + BeiDou Navigation +angle sensor +IMU	An angle sensor +2 stereo cameras
Jiangyu Autonomous Driving System	Vision + BeiDou Navigation +angle sensor +IMU	2 angle sensors +3 stereo cameras
KM-507Autonomous Driving System	BeiDou +Inertial Navigation +mm-wave radar +vision	An angle sensor +2 stereo cameras +a radar
TAGE IDRIVER	SLAM+GPS+IMU	Two 16-channel lidars, two radars
VIPIONEERS	SLAM+GPS+IMU	A 32-channel lidars, three 16-channel lidars, three radars, a stereo camera (optional)
EQ	SLAM+GPS+IMU	Two 16-channel lidars, two radars
CIDI	SLAM+GPS+IMU	Two 16-channel lidars, three radars, a stereo camera
Boonray	SLAM+GPS+IMU	Two stereo cameras, two 16-channel lidars, a stereo camera
autowise.ai	SLAM+GPS+IMU	Five 16-channel lidars, four cameras, two radars, 12 ultrasonic
Xpeng P7	AutoNavi (amap.com) HD map + Dual frequency high precision GPS +RTK+IMU	14 cameras + 5 radars + 12 ultrasonic sensors

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