

China Automotive Human-Machine Interaction (HMI) Research Report, 2020

Feb.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

Automotive HMI refers to the process of information exchange between humans and the car through interaction means such as voice, gesture, face, AR, holographic display and fingerprint recognition.

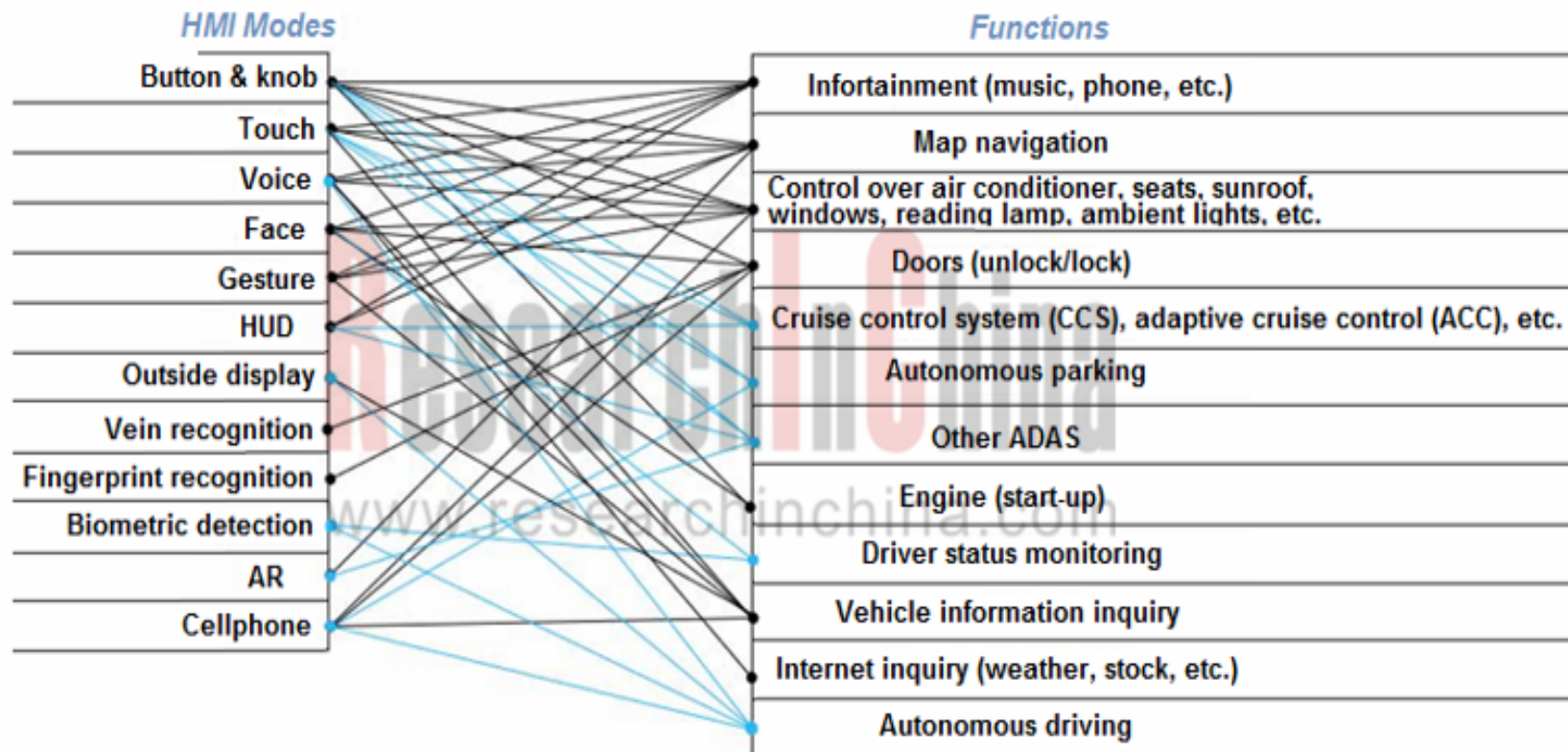
Over a decade of development, in-car voice interaction was installed to 28.7% of vehicles and even a higher share of new models on the market in the first half of 2019. Voice interaction is extending from infotainment (navigation, multimedia, etc.) to body control (windows, sunroof, lights, wipers, trunk, etc.) and life services (car-home connectivity, in-car shopping, etc.), and voice technology is getting through to infotainment protocols and in-car ecology.

Gesture recognition was first found in BMW model in 2015, and has been successively available in China-made models such as the Traum SEEK 5, Chery 5X, Xpeng G3 Premium, etc. It is mainly used to control the display system in the car, such as music play, volume regulation, map zoom, etc., as a supplementary interactive mode in a quiet environment.

Face recognition, unveiled in China in 2018, has been seen in Leapmotor S01, Chery's EXEED TX, WEY VV6, WM Motor's EX5, Geely Xing Yue and other models, showing a rosy prospect. Face recognition is mostly for personalized settings (seat position, ambient light preference, rearview mirror position, music recommendation, etc.) and driver status detection. EXEED TX supports to buy movie tickets by face scanning and heads toward face payment.

In addition, new interactive modes like window interaction (WM Motor's EX5), body interaction (BAIC BJEV's LITE), vein recognition (Leapmotor S01), fingerprint recognition (Hyundai's New SantaFe), and AR navigation (Roewe Marvel X) have been available onto production vehicles.

Automotive HMI Modes and Functions



Source: ResearchInChina

Foreign automotive HMI systems include BMW iDrive, Mercedes-Benz MBUX, Audi MMI, Ford SYNC +, etc. Among them, BMW iDrive has iterated to 7.0, with 6 interaction modes covering button, knob, touch, gesture, voice and cellphone. BMW iDrive is the first system in the world that adds gesture interaction, which can control phone calls, music playback, volume, map, menu, etc.

Chinese automotive HMI systems mainly embrace Geely GKUI, BYD DiLink, GAC ADiGO, SAIC Banma, Chery Lion, NextEV NIO OS, Xpeng Xmart OS, etc. Among them, Geely GKUI has been upgraded to GKUI2019 with 8 interaction modes via button, knob, touch, voice, cellphone, HUD, face recognition, and smart watch, where unique features are watch interaction (mainly ideal for remote car control and vehicle information inquiry like mobile phone interaction) and face recognition (FACE ID personalized settings).

In short, automotive HMI has entered the multi-modal (voice, gesture, face, etc.) interaction stage and is heading toward functional enrichment and multi-modal fusion. Moreover, HMI will transfer from in-vehicle interaction to multi-scenario interaction, from "passive interaction" to "active interaction".

China Automotive Human-Machine Interaction (HMI) Research Report 2020 highlights the followings:

- HMI (definition and development history), automotive HMI (design, development course, etc.);
- Automotive HMI modes (voice interaction, face recognition, gesture recognition, and display inside and outside the vehicle);
- Development history and modes of HMI systems of automakers at home and abroad, such as BMW iDrive, Mercedes-Benz MBUX, Audi MMI, Geely GKUI, SAIC Banma SmartDrive, Chery Lion, BYD DiLink, GAC ADiGO, NextEV NIO OS, etc.
- Development trends of automotive HMI.

1 Development History of Automotive HMI

- 1.1 Definition of HMI
- 1.2 Development History of HMI
- 1.3 Development History of Automotive HMI
- 1.4 Design of Automotive HMI

2 Automotive HMI Modes

- 2.1 Overview
- 2.2 Vehicular Voice Interaction
 - 2.2.1 Introduction
 - 2.2.2 Status Quo
- 2.3 Vehicular Face Recognition
 - 2.3.1 Introduction
 - 2.3.2 Status Quo
- 2.4 Vehicular Gesture Recognition
 - 2.4.1 Introduction
 - 2.4.2 Status Quo
- 2.5 Display Inside and Outside the Vehicle
- 2.6 Other Interactive Modes

3 Automotive HMI System

- 3.1 Latest HMI Systems of Automakers at Home and Abroad
- 3.2 BMW iDrive7.0
 - 3.2.1 HMI System Development History and Introduction

- 3.2.2 Models Supported by iDrive7.0
- 3.3 Mercedes-Benz MBUX
 - 3.3.1 HMI System Development History and Introduction
 - 3.3.2 Models Supported by MBUX
- 3.4 Audi MMI
 - 3.4.1 HMI System Development History and Introduction
 - 3.4.2 Models Supported by MMI
- 3.5 Geely GKUI
 - 3.5.1 HMI System Development History and Introduction
 - 3.5.2 Models Supported by GKUI
- 3.6 SAIC Banma
 - 3.6.1 HMI System Development History and Introduction
 - 3.6.2 Models Supported by Banma
- 3.7 Chery Lion
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 - 3.7.2 Models Supported by Lion
- 3.8. BYD DiLink
 - 3.8.1 HMI System Development History and Introduction
 - 3.8.2 Models Supported by DiLink
- 3.9 GAC ADiGO
 - 3.9.1 HMI System Development History and Introduction
 - 3.9.2 Models Supported by ADiGO
- 3.10 NextEV NIO OS
 - 3.10.1 Introduction to the System and Models Supported



4 Automotive HMI Tendencies

- 4.1 In-vehicle Interaction to Multi-scenario Interaction
- 4.2 Multi-channel Fusion Interaction Will Become the Mainstream Interaction Mode
- 4.3 Automobiles Will Be Personalized
- 4.4 From "Passive Interaction" to "Active Interaction"



Development History of HMI
Development History of Automotive HMI
Integration of Automotive HMI Design and Multi-disciplinary Integration
"Pyramid" of Automotive HMI Design
Automotive HMI Design Process
Automotive HMI Modes and Functions
Key Technologies on Voice Interaction
Voice Interaction Industry Chain Companies in China
Installations and Installation Rate of Passenger Car Voice Function in China, 2018-2019
Top 10 Automakers by Passenger Car Voice Installation (Market Share) in China, H1 2019
Functional Configuration of Models with Voice Interaction in China (Some Automakers)
Face Recognition Process and Core Technology
Face Recognition Industry Chain Companies in China
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Gesture Recognition Industry Chain
Functional Configuration of Models with Gesture Recognition in China
Inside and Outside Display of Some Models
Latest HMI Systems of Automakers at Home and Abroad
Evolution of BMW iDrive (1.0 to 7.0)
Evolution of Mercedes-Benz HMI
Evolution of Audi HMI
Evolution of Geely HMI
Evolution of SAIC HMI



Evolution of Chery HMI

Evolution of BYD HMI

Evolution of GAC HMI

'Public Persona' Cases of Automakers

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