Automotive Industry Weekly Digest

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S&P Global
Mobility

Contents

[Forecast & Analysis Highlights] Changan Auto’s net profit increases 45% YOY to 11.33B yuan in 2023

S&P Global Mobility perspective	
Implications	Chongqing Changan Automobile (Changan) posted revenues of 151.3 billion yuan (US$20.9 billion) for the full-year 2023, marking an increase of 24.8% year over year, according to its 2023 annual report. Changan’s net profit attributable to shareholders of the listed company rose by 45.3% year over year to 11.33 billion yuan in 2023.
Outlook	S&P Global Mobility forecasts sales of Changan brand’s passenger vehicles, including the Qiyuan series, to rise 14% year over year to 1.28 million units in 2024. Sales of the Deepal division are forecast to grow by 70% to 223,155 units in 2024, helped by launches of new NEV models including the G318 SUV.

Chongqing Changan Automobile (Changan) posted revenues of 151.3 billion yuan (US$20.9 billion) for the full-year 2023, marking an increase of 24.8% year over year, according to its 2023 annual report. Changan’s net profit attributable to shareholders of the listed company rose by 45.3% year over year to 11.33 billion yuan in 2023.

Changan’s automotive revenues from its domestic business increased 21.3% year over year to 130.8 billion yuan in 2023, while the automotive revenues contributed by its overseas business rose by 53.1% year over year to 20.54 billion yuan. In 2023, Changan’s vehicle sales, including sales of the Changan Ford and Changan Mazda joint ventures, increased by 8.8% year over year to 2.55 million units. The company’s vehicle exports were 358,000 units, up 44% year over year.

The company’s automotive gross margin stood at 18.4% in 2023. Changan has disclosed the financial results of its two new-energy vehicle (NEV) divisions, Deepal and Avatr Technology, in its 2023 annual report. Deepal, a subsidiary of the company of which Changan holds 51%, reported a net loss of 2.999 billion yuan on revenues of

25.88 billion yuan in 2023. Avatr Technology posted 5.64 billion yuan in revenues in 2023 and its net loss reached 3.69 billion yuan. Changan has an equity interest of 40.99% in Avatr. Both companies launched new models in the market in 2023 and increased expenditures in marketing, sales and branding to promote their new products. Deepal, which has two models, the SL03 and the S7, sold 128,865 vehicles in 2023. Avatr, which is premium electric vehicle (EV) brand, sold 26,407 vehicles in 2023.

Outlook and implications

Changan has witnessed strong growth in the NEV market in 2023. NEV sales of Changan's self-developed brands, including Changan, Deepal and Changan Qiyuan, increased by 75% year over year to 474,000 units last year. Deepal's two models developed on the EPA platform for NEVs enable Changan to compete with BYD in the price segment of 130,000-200,000 yuan (US$17,950-27,620). Both the Deepal S7 and the Deepal SL03 are available with either a battery electric vehicle powertrain or a range-extended electric vehicle powertrain, which help the two models to appeal to a wider group of consumers.

In 2024, Changan's NEV product lineup is to be expanded further to include Mazda and Ford brand models developed on the EPA platform. The two global automakers, which operate joint ventures with Changan, are looking to leverage the Chinese automaker's supply chain and EV platform to bring competitive new models to the Chinese market. The first Mazda model developed on the Changan platform will make its debut at the Auto China 2024 expo in Beijing, which opens on April 25. The Deepal brand will also announce the pricing of its all-new off-road sport utility vehicle (SUV), the G318, at the auto show. Changan said it will also refresh its internal combustion engine (ICE) product lineup with new powertrain technology and advanced driver-assistance systems. In 2023, Changan's sales were still underpinned by its ICE product lineup. The Changan CS75 Plus SUV, Eado sedan and Uni-V sedan were the company's three best-selling models in 2023. S&P Global Mobility forecasts sales of Changan brand passenger vehicles, including the Qiyuan series, to rise 14% year over year to 1.28 million units in 2024. Sales of Deepal are forecast to grow by 70% to 223,155 units in 2024, helped by launches of new NEV models, including the G318 SUV.

[OEM Highlights] China’ s Huawei launches software brand for intelligent driving

Chinese tech company Huawei has introduced a new software brand called Qiankun for intelligent driving, reports Reuters. Qiankun aims to provide autonomous vehicle (AV) systems that encompass the driving chassis, audio, and driver's seat. Huawei's CEO of Intelligent Automotive Solution (IAS) business unit, Jin Yuzhi, stated that by the end of 2024, over 500,000 cars equipped with Huawei's AV system will be on the road. Additionally, Huawei expects more than 10 car models incorporating the Qiankun system to be available within a year.

Outlook and implications

Huawei launched its smart car unit in 2019, with the goal of becoming a leading supplier of software and components to partners in the intelligent electric vehicle (EV) era. The company has already unveiled seven EV models in collaboration with Chinese automakers, including three Aito-brand models with Seres, the Luxeed S7 sedan co-developed with Chery, two models with Changan Auto-backed Avatr, and one with BAIC-owned Arcfox. In November 2023, Huawei said that it will spin off its IAS business unit, which will reportedly be valued between US$28 billion and US$35 billion.

[OEM Highlights] Xiaomi announces SU7 orders reach 70,000 units

Xiaomi has said that it had secured more than 70,000 lock-in orders for the SU7 electric sedan as of Saturday, reports Reuters, citing Xiaomi’ s founder and CEO Lei Jun. Locked-in orders refer to when buyers have opted for non-refundable deposits. Lei said that Xiaomi is targeting more than 100,000 deliveries for the SU7 in 2024. He also expected the SU7 to post a gross profit margin of 5–10%.

Outlook and implications

Xiaomi is expected to expand its vehicle lineup with a sport utility vehicle (SUV) in 2025, which will be followed by a third model in 2026. The SU7, which is priced from 215,900 yuan to 299,900 yuan, has seen a strong order intake in the past few weeks. However, the model’s significant order backlog also strained Xiaomi’s operations regarding production ramp-up, delivery speed, and customer service. Li said that it will provide an update on Xiaomi’s production and delivery plans at the Auto China 2024, which takes place from April 25 to May 4 in Beijing. Lei said in a post published on China’s social media platform Weibo on April 23 that the company already began delivering the SU7 standard version and the highest-specification model, the Max, to customers from April 18. According to the company’s original delivery timetable, deliveries of the two models were to begin at the end of April.

[Technology & Mobility Highlights] Germany, China sign joint declaration to cooperate on automated and connected driving

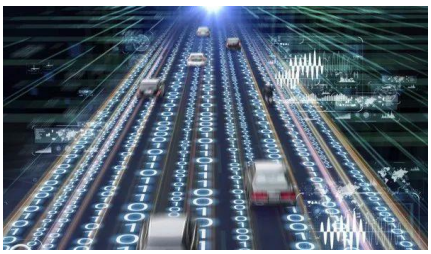
Germany and China have signed a joint declaration to collaborate on automated and connected driving, with a focus on enabling data transfer from China to Germany, reports Reuters. The two countries aim to establish shared standards and rules for managing the data generated during the development of automated driving. The German Association of the Automotive Industry (Verband der Automobilindustrie [VDA]) believes that this cooperation will lead to resource savings in development and production.

Outlook and implications

Autonomous vehicles (AVs) collect extensive data on passenger and driver behavior, as well as information about the vehicle’ s surroundings through lidar and other sensors. Furthermore, cars are increasingly gathering data on drivers by connecting to their phones and other devices. The joint declaration between Germany and China on autonomous and connected driving comes at a time when both the EU and the US have expressed concerns about the security risks associated with Chinese technology entering their markets and collecting data locally. Meanwhile, China has tightened its oversight of data management, requiring most industries to obtain permission before transferring data abroad. Initially, Chinese regulators proposed a ban on smart vehicles transferring data abroad, but they have since shown a willingness to relax their position following complaints from businesses.

[Technology & Mobility Highlights] Audi partners with Applied Intuition to develop unified solution for automated driving

Applied Intuition and Audi have joined forces to develop a unified solution for the development, validation, approval, and implementation of automated driving (AD) systems at the vehicle level for the Audi Group. This partnership aims to establish a new standard for the efficient and secure validation and release of AD functions across a wider operational design domain, according to a company statement. By leveraging Applied Intuition's simulation and data management solutions, along with specialized applications co-developed by both companies, the partnership seeks to overcome the complexity of AD functions that often leads to a slow development process. The resulting unified framework incorporates Audi's expertise in scenario-based systems engineering and Applied Intuition's software engineering expertise to deliver a distinct AD release and lifecycle management solution that meets current and future regulatory requirements. The framework may also be adopted by other automotive equipment manufacturers in the future.



Outlook and implications

Applied Intuition, founded in 2017, is a vehicle software supplier serving the automotive, trucking, construction, mining, agriculture, and defense industries. The company has consistently achieved triple-digit percentage growth year over year and counts 18 of the top 20 automotive OEMs in its global customer base. In 2023, Applied Intuition acquired autonomous trucking firm Embark Technology in an all-cash transaction with an equity value of approximately US$71 million. Last month, Applied Intuition raised US$250 million in a Series E funding round at US$6 billion valuation.

[EV & Energy Efficiency Highlights] Volvo Cars signs battery recycling partnership with CATL in mainland China

The strategic partnership aims to promote the recycling of battery materials and reduce the carbon footprint of EVs throughout their life cycle

Source: Getty Images/Bet_Noire

Volvo Cars has signed a strategic cooperation agreement with the world's largest battery-maker Contemporary Amperex Technology Co. Ltd. (CATL) to focus on electric vehicle battery recycling, according to a news report published by CnEVPost on April 18.

Citing the automaker, the report mentioned that the strategic partnership between Volvo Cars and CATL aims to promote the recycling of battery materials and reduce the carbon footprint of EVs throughout their life cycle.

It is known that batteries are made of a variety of non-renewable metal elements and their carbon emissions from mining and processing account for a significant proportion of the battery supply chain. Volvo Cars and CATL plan to reduce EV full life-cycle carbon emissions by dismantling, recycling and reusing used batteries.

According to the report, the Geely-owned Swedish carmaker plans to recycle retired batteries from EVs for its portfolio, as well as the batteries scrapped during factory production. These batteries will be dismantled by Volvo-certified suppliers to extract more than 90% of the nickel, cobalt, lithium and other critical materials. These materials will be supplied to CATL, which will recycle these to produce new batteries for use in the production of new Volvo EVs.

The agreement between the two companies is being seen as an important milestone in building a battery recycling, closed-loop business model in mainland China.

Volvo Cars' efforts to recycle battery materials are aligned with its plan of achieving net-zero greenhouse gas emissions by 2040, which will require joint efforts from suppliers across the value chain.

[EV & Energy Efficiency Highlights] Tozero ships first batch of recycled lithium from used batteries

Tozero aims to contribute to easing the critical raw material supply challenges in Europe, with plan to scale up production of recycled battery materials to hundreds of tons by 2026

Source: Getty Images/D3Damon

Tozero GmbH, a Munich-based battery material recycling startup, has shipped recycled lithium derived from battery waste using its proprietary hydrometallurgy process to its customers in Europe, the company announced on April 23.

The development marks a significant breakthrough for the startup as the shipment is its first commercial delivery.

Launched in July 2023, Tozero operates from a pilot plant based in Munich. The company claims that its cutting-edge hydrometallurgy process maximizes the recovery of valuable materials such as lithium and graphite from waste batteries. Once recovered, these critical battery materials are reintroduced into the supply chain, significantly reducing the need for new material extraction and processing, reducing CO2 emissions by up to 70% compared to conventional lithium mining and processing techniques.

"The technology aligns with European Green Deal objectives, achieving the EU's Battery Directive goals of over 80% recovery rate by 2031, ahead of schedule," Tozero said in a statement Tuesday.

The startup aims to contribute to easing the critical raw material supply challenges in Europe, with plan to scale up production of recycled battery materials to hundreds of tons by 2026 and establishing a local battery supply chain.

"Our mission is to truly bring lithium-ion battery waste to zero and each ton of recycled lithium represents a significant step towards reducing our ecological footprint and achieving a net-zero future," said Sarah Fleischer, co-founder and CEO of Tozero.

[Supplier Highlights] Covestro joins hands with original equipment manufacturers and suppliers to develop closed-loop plastics recycling system for end-of-life vehicles

Key partners include NIO of China and Volkswagen, Chinese recycling company GEM, and third-party certification bodies like TÜV Rheinland.

Source: Getty Images/petovarga

With an increase global focus on sustainability and stringent regulatory requirements, the automotive industry is realizing the necessity of plastic recycling for sustainable development. Responding to this changing

dynamics, German supplier, Covestro has announced joining hands with the automotive value chain, and is spearheading the concept of car-to-car closed-loop plastics recycling, which is emerging as a promising solution to tackle the challenges of plastic waste management in the sector.

According to a company press release on April 23, a joint pilot program initiated by German federal enterprise GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), Covestro and partners will collaborate to establish closed-loop pathways for high-value plastics from end-of-life vehicles (ELVs). The target is to create an efficient and sustainable automotive plastic recycling system, advancing the more sustainable "transformation of the industry".

This pilot program was announced at Covestro's booth during the CHINAPLAS 2024 international trade fair in Shanghai. Notable partners include leading automotive brand owners such as NIO of China and Volkswagen, Chinese recycling company GEM, and third-party certification bodies like TÜV Rheinland.

As part of the pilot program, a team of professionals will explore methods to recycle and process waste polycarbonate components, such as end-of-life car headlights, into post-consumer recycled (PCR) polycarbonates. The recycled materials will then be reused for various interior and exterior vehicle applications, saving resources and reducing carbon emissions.

This could offer urgently needed long-term solutions for the automotive manufacturing industry, which seeks high-quality PCR materials that are compliant and high-performance amid increasingly stringent regulations. For example, in 2023, the European Commission proposed a new regulation to enhance the circularity of the automotive sector, mandating that 25 percent of the plastics used in a new vehicle must come from recycling, of which 25 percent must be recycled from end-of-life vehicles.

Speaking on the initiative, Lily Wang, Global Head of the Engineering Plastics Business Entity at Covestro said, "We are proud to partner with like-minded value chain allies to pioneer closed-loop plastic recycling in the automotive sector. By leveraging our collective strengths and resources, we are confident in our ability to build a closed-loop for automotive plastics recycling, thereby reducing waste and carbon emissions at the source while improving resource use efficiency. Through this joint program, we aim to expedite the automotive industry's transition toward a more climate-neutral and sustainable future."

Adding further, Martin Hofmann, Cluster Head in charge of Climate, Energy, Environment, and Biodiversity at GIZ said, "The automotive industry stands as one of the most resource-intensive sectors globally, yet the potential of high-value plastics from ELVs remain largely untapped. GIZ is steering an innovative endeavor to explore closed-loop pathways for high-value plastics from ELVs. I firmly believe that GIZ and our partners can forge a path towards the transition to a sustainable, circular economy."

Covestro plans to more solutions for the automotive industry such as an intelligent front grill and mono-material polycarbonate headlamps that are designed for a connected and circular future at CHINAPLAS 2024.

[Supplier Highlights] Pirelli showcases new products, focuses on sustainability at TIRE COLOGNE 2024

The stand will feature a special focus on sustainability

Source: Getty Images/Galina Shafran

Pirelli will exhibit new products and technologies for high-performance cars and motorcycles at TIRE COLOGNE 2024, held in Milan from April 22nd to 25th.

The company's CEO, Wolfgang Meier, emphasizes Pirelli's position as a leading development partner for premium and prestige segments of the automotive industry. The stand will feature a special focus on sustainability, with information provided on the company's commitment to the sustainability transition and future-oriented products.

New products to be unveiled include the P Zero E summer tyre, which combines Pirelli's latest technical innovations and meets the highest demands of electric and sustainable mobility. The tyre features a new RUNFORWARD technology that allows for continued driving for up to 40 km at 80 km/h without tyre pressure in the event of a puncture. The P Zero E is the first UHP tyre made of more than 55% bio-based and recycled materials and is the only one certified by a third party.

Additionally, the Cinturato All Season SF3 tyre for medium and compact cars will be displayed. This all-season tyre has the highest A rating for wet grip on the EU tyre label in all sizes and offers stability, noise comfort, and low rolling resistance. Independent tests have praised the tyre's excellent braking performance on dry, wet, and snowy roads.

DRIVER, Pirelli's commercial subsidiary, will also be represented at the stand with an integrated showroom offering advantages of the "DRIVER Tyres & Service" premium retail concept for independent tyre dealers and garages.

1. The bio-based and recycled content of the P Zero E tyre ranges between 29-31% and 25-27%, respectively, depending on tyre size. The bio-based materials used are natural rubber, textile reinforcements, bio-chemicals, bio-resins, and lignin, while recycled materials are metallic reinforcements, chemicals, and - through mass balance - synthetic rubber, silica, and carbon black

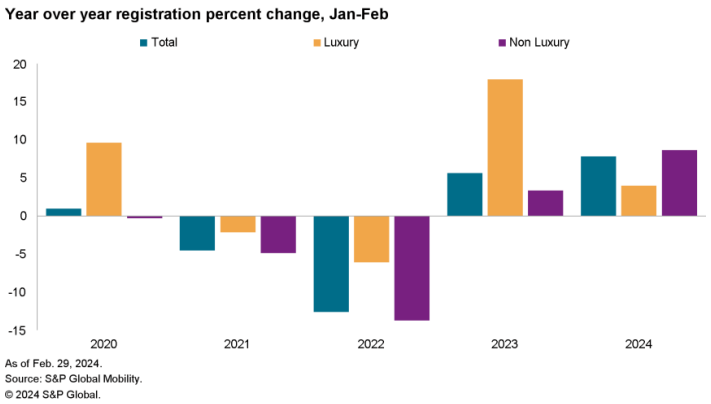
2. Dekra test center conducted comparative tests in DECEMBER 2023 and JANUARY 2024 on the P Zero E tyre size 22540 R18, with report 23CPCEXT-175-2. .

[VIP ASSET] Luxury models' market share growth slows as US light-vehicle sales increase

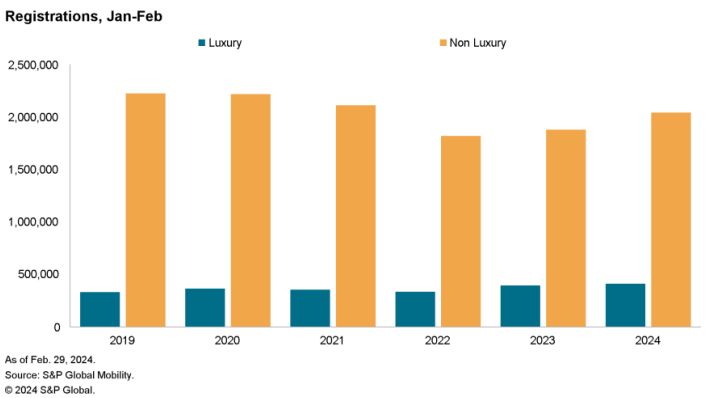
S&P Global Mobility perspective	
Implications	With US light-vehicle registration data available for January and February 2024, we look at the interplay between luxury and non-luxury vehicle registrations from 2019 through 2024 for the first two months of the year.
Outlook	With more buyers returning to the market in 2023 and 2024, early 2024 data reflects more non-luxury buyers. After several years in which luxury segment registrations have outpaced the overall industry, the first two months of 2024 tell a somewhat different story. Production and inventories are approaching normal, and non-luxury buyers seem to be coming back to the market. This is spurring an increased focus on meeting the needs of a wider range of buyers by improving the availability of more affordably priced vehicles. Although US light-vehicle sales improved about 12% in 2023, S&P Global Mobility forecasts that they will improve about 2.5% this year, which could reach 16.0 million units. To continue growth, the market does need more accessible vehicles, and there is likely to be continued change for luxury vehicles' market share.

Getty Images

With US light-vehicle registration data available for January and February 2024, we look at the interplay between luxury and non-luxury vehicle registrations from 2019 through 2024 for the first two months of each of those years. As more buyers have returned to the market in 2023 and 2024, early data reflects more non-luxury-vehicle buyers.



In January–February 2020, total US light-vehicle registrations increased just under 1% year over year. However, luxury vehicle registrations grew 9.6% and non-luxury vehicle registrations fell 0.3%. During the COVID-19 pandemic and immediately afterward, luxury vehicle registrations typically outperformed both the overall market and the non-luxury vehicle segment. In 2021, when the market was heavily inventory-constrained, overall sales fell 4.5% year over year; luxury registrations fell 2.2% while non-luxury fell 4.9%. In January-February 2024, total registrations grew 7.8% year over year, while luxury registrations grew only 4% and non-luxury registrations grew 8.6%. This is a change from results since 2020, when the growth trend tended to favor luxury vehicles. The most pronounced was in 2023, in fact, when luxury registrations grew by just under 18% year over year; total market registrations grew only 5.6% and non-luxury registrations only 3.3%. In 2024, however, the first two months of the year show the opposite effect. Total light-vehicle market registrations grew 7.8%, non-luxury registrations grew 8.6% and luxury registrations grew 4.0%.



In terms of market share, luxury registrations also captured the highest share in the first two months of 2023, reaching 17.4%. Luxury registration market share had been growing steadily since at least 2019, with the 2023 share gain of 1.8% year over year also reflecting the largest percentage gain in the past five years. In the first two months of 2024, luxury vehicles captured just under 17% of the market. This share remains at a historically high level, but also shows the first contraction since before 2019.

Perhaps the single most significant contributor to the gain in luxury registrations may also help hold the reason why growth in luxury registrations skyrocketed, but also why they slowed in the first two months of 2024. Volume is continuing to increase; it is not accurate to suggest that luxury vehicle registrations are contracting. In 2019, 333,324 luxury vehicles were registered in the first two months of the year; in 2024, this was 411,507 units. Although Tesla is not the only brand to improve, much of the expansion in registration volume in the luxury sector was from increased capacity and adding the Model 3 and Model Y. The volume difference from the first two months of 2019 and the first two months of 2024 was 78,278 units. Tesla was the top luxury brand, with 85,454 units registered in early 2024, versus 32,319 in the first two months of 2019. Over that five-year period, Tesla registrations grew 164%, while the luxury segment overall grew 23.5%. In the first two months of 2024, Tesla’s lead over the next-highest luxury brand, Lexus, was more than 30,000 units, although Tesla registrations dropped 6.7% year over year while Lexus rose 23.5%. Excluding Tesla, luxury registrations in the first two months of 2024 were up 7.2% year over year and 8.4% higher than the same period of 2019. In the first two months of 2019, Tesla accounted for 9.7% of luxury vehicle registrations; in the same period of 2024, Tesla had a 20.8% share of luxury vehicle registrations, down from 23.2% in the first two months of 2023.

Given Tesla’s impact on demand growth, a slide in Tesla registrations can also have an outsized impact. In the first two months of 2024, Tesla’s US registrations dropped 6.7%, while registrations of luxury vehicles overall improved 4.0%, as noted. Tesla was not the only luxury brand to see registrations fall year over year in the first two months of 2024, but its volume drop was 6,174 units. Other brands to fall included Porsche, down 27% to 8,487 units; Audi, down 2.1% to 31,463 units; Lucid, dropping 33% to 691 units; and Polestar, which is shifting to new models and had a 68% decline to 632 units. Tesla’s fall of 6,174 units was higher than the others combined.

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[VIP ASSET] The shift to software-defined vehicles: Q&A with Iflytek

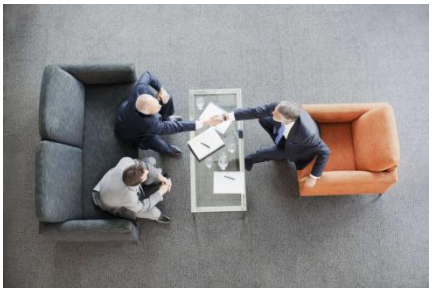
Software-defined vehicles (SDVs) use software to govern operations, incorporate new features and facilitate the integration of novel functionalities. This concept marks an advancement in the automotive industry, laying the foundation for autonomous driving and vehicle connectivity technologies.

The evolution of SDVs entails separating software and hardware development, such as smartphones. Original equipment manufacturers are establishing "walled gardens" for applications.This shift encompasses continuous agile software development, heightened computing requirements for data processing, a modular service-oriented architecture and fortified security measures against cyber threats.

The automotive industry is rapidly advancing toward SDVs, with the promise of improved comfort, safety and customization. As collaborations between OEMs and tech companies flourish, SDVs present additional challenges, such as cybersecurity risks and design intricacy.

The transition from domain to centralized architecture is also progressing, converting vehicles into mobile data centers. In this transformative journey, standards, collaborations and digital twin technology stand out as critical components, promising a future where software dictates the driving experience.

To delve deeper into this transformation, S&P Global Mobility initiated discussions with leading players in the SDV market, including Iflytek.



Key takeaways:

- Distributed and centralized architectures have pros and cons, with distributed architectures offering lower component maintenance costs and centralized architectures providing flexibility and the ability to integrate new functions.
- Communication speeds have increased from Kbit/s to Gbps due to high-resolution cameras, with high-speed communication required in the entertainment domain and real-time data communication and lowlatency needed forvehicle communication and automated driving.
- SDVs are built on vehicle hardware, with the cockpit domain transformed by mobile internet advancements, enabling intelligent features and turning the vehicle into a versatile space.

- Software development in the automotive industry follows standards, such as Automotive ASPICE and IATF 16949, with different software demands for each domain and complex software architecture in the central computer.
- Lawenforcement and traceability are crucial for the safety and security of connected cars, with software protection for the network and gateway playing a key role in preventing unauthorized access and malicious attacks.
- In traditional partnerships, co-creation and co-development are necessary due to uncertain software specifications, and effective software development requires partnerships, frameworks and integration of different software modules. Natural Language Understanding (NLU) and Large Language Models (LLMs) improve user experience, while automated driving involves training algorithms and LLMs facilitate vehicle design and generate visuals. Manufacturing planning optimizes production processes, and LLMs are used in sales and marketing. Vehicle manuals provide maintenance guidance, and human salespeople establish emotional connectionswith clients.

Lei Qin Hui

Iflytek Intelligent car CTO、Deputy General Manager

About Iflytek：

Iflytek is an intelligent voice and artificial intelligence company in the Asia-Pacific region. They specialize in providing intelligent solutions for the automotive industry, including intelligent cockpits, sound effects, driving systems and services for automotive companies. As of March 2024, Its automotive intelligent products and technologies have been embedded and accumulated in 57 million vehicles, with 10 billion online interactions and 25 million monthly active users.

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