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Key trends in software-defined vehicles: Insights from Neusoft

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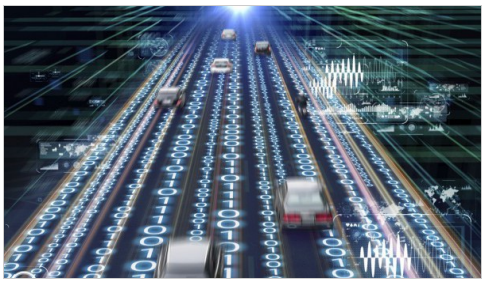
Q&A with Neusoft



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Software-defined vehicles (SDVs) are reshaping the automotive industry, marking a shift where software — not hardware — is at the core of vehicle innovation. Unlike traditional vehicles that depend largely on mechanical and electrical components, SDVs integrate sophisticated software platforms to deliver advanced capabilities such as intelligent cockpits, advanced driver assistance systems and seamless connectivity. This evolution is largely driven by consumer demand for safer, smarter and more connected driving experiences.

As the industry transforms, the emphasis is moving from hardware-centric manufacturing to software-driven development and user-centric services. This paradigm shift is giving rise to new business models built around software subscriptions, over-the-air (OTA) updates and continuous service delivery. Manufacturers are now focused on capturing value throughout the vehicle's life cycle rather than just at the point of sale.

The development process is also becoming more agile and collaborative. Traditional distinctions between original equipment manufacturers, tier 1 and tier 2 suppliers are fading, giving way to integrated ecosystems that include tech companies and platform providers. These cross-industry partnerships are essential for delivering the complex software stacks that power SDVs.

At the same time, regulatory frameworks are evolving to accommodate this shift, with regions such as mainland China and Europe adopting differing but increasingly supportive approaches to innovation in software-defined mobility.

To gain deeper insight, Owen Chen, Senior Principal Analyst at S&P Global, sat down at the IAA Mobility 2025 with Angela Wang, senior vice president of Neusoft Corp., chairwoman and president of Neusoft Europe, and chairwoman of Neusoft America.

Key takeaways:

1. **Defining SDVs**: Neusoft defines SDVs as vehicles where software plays a central role in connecting the value chain among OEMs, partners and users. In mainland China, there is a strong focus on consumer-friendly features such as intelligent cockpits and ADAS, while

Europe emphasizes foundational software and architecture.

2. **Shifting industry focus**: The automotive industry is moving away from traditional hardware manufacturing toward software development and customer experience. This change is leading to new business models based on software subscriptions and ongoing services, with a focus on maximizing the value throughout the vehicle's life cycle.
3. **Collaboration and ecosystem building**: Neusoft is working to build a collaborative ecosystem for SDVs by partnering with various stakeholders, such as OEMs, chip manufacturers and software developers. This includes developing integrated solutions and enhancing data services to support the evolving needs of the market.
4. **Adapting to market needs**: Neusoft is committed to adapting its services to meet the distinct needs of different regions. In mainland China, the focus is on application-layer software, while in Europe, the emphasis is on foundational software. This approach allows Neusoft to provide tailored solutions that align with the specific demands of each market.

The following is an edited transcript of the conversation.

S&P Global Mobility: How does Neusoft define software-defined vehicles? Do you see any differences between how SDV is defined in China versus Europe?

Angela Wang: When we talk about SDVs, there are three key aspects that really stand out:

1. **Reconstruction of technical barriers**: The competitive landscape is shifting. Instead of focusing solely on the traditional "big three" vehicle components — engine, chassis and transmission — companies are now prioritizing software research and development. With the skyrocketing demand for automotive software, we're seeing software costs make up a larger and larger chunk of the total vehicle bill of materials (BOM).
2. **Evolution of development models**: The way we develop vehicles is changing too. As hardware and software become more decoupled, along with the systems and applications they support, the development process is moving towards an agile DevOps model. This means integrating development, testing and operations into one smooth workflow.
3. **Shift in value drivers**: As vehicles get smarter and more connected, consumers are increasingly focused on entertainment features, convenience and the reliability of mobile internet connectivity. Now, the consumer experience is what truly defines these products. To innovate effectively, we need to have a deep understanding of consumer needs and be able to respond quickly.

China versus Europe

When we compare SDVs in China and Europe, there are some notable differences, particularly in consumer preferences, ecosystem participants and regulatory environments:

- **Consumer preferences**:
  - **China**: There's a large pool of tech-savvy consumers who are open to embracing automotive digital ecosystems — think intelligent cockpits and ADAS. They're eager to try out new intelligent features.
  - **Europe**: In contrast, European consumers tend to be more conservative. They prioritize mechanical quality, basic safety and brand heritage. They also have a strong focus on data privacy and are cautious about adopting unverified innovative features.
- **Ecosystem participants**:
  - **China**: The industry is rapidly evolving towards SDVs, with OEMs and suppliers working

closely together. Some suppliers have even moved up the ranks from tier 1 to tier 0.5, now capable of providing large-scale SDV technologies that empower OEMs and drive innovation within the ecosystem.

- **Europe**: Here, OEMs remain the dominant players in the value chain. While suppliers are gradually improving their software capabilities, they still largely depend on OEMs for direction.

- **Regulatory environment**:
  - **China**: The regulatory framework is quite collaborative, with the government actively supporting SDV technologies through policies and financial incentives to encourage industrial upgrades.
  - **Europe**: The regulatory landscape is more fragmented, focusing on promoting decarbonization and protecting data privacy, with cybersecurity being a key requirement for any new technology.

What is Neusoft's strategic positioning and core competence in the SDV field?

Strategic positioning

In the context of SDVs, Neusoft serves as an innovation partner for OEMs and partners within the industrial chain, providing a range of platforms, products, total solutions and services. Our key focus areas include next-generation automotive software platforms, vehicle operating systems, intelligent cockpits, intelligent driving systems, EV powertrain systems, vehicle-cloud integration, intelligent communication, information security, and big data.

Core competitiveness

Neusoft focuses on its software capabilities, leveraging over 30 years of experience with global customers. This experience helps us understand the trends and technical demands related to SDVs. In a market with rapid changes and innovation, Neusoft can respond effectively and adapt our offerings to meet customer needs. Our primary goal is to drive software innovation and improve consumer experience to assist our customers in their transformation efforts.

- **Continuous innovation capabilities**:
  - **Product and technology innovation**: Neusoft drives software innovation by analyzing consumer needs and industry trends. For example, our One Sight in-vehicle augmented reality (AR) software system enhances driving safety and user experience by integrating virtual images with real-world scenarios.
  - **AI application innovation**: We work with OEMs and leading model providers to develop integrated AI solutions. Our AI middle platform supports business process restructuring and software production. For instance, our AI intelligent testing platform has reduced testing costs by 55%, shortened testing cycles by 50%, and increased scenario coverage by 90%.
  - **Leadership in standards**: Neusoft participates in the development of over 60 international and national industrial standards, contributing to technological R&D and promoting standardized practices in the industry.
- **Comprehensive product portfolio**:
  - Our product range for intelligent vehicles includes IVI (in-vehicle infotainment) systems, smart cockpit controllers, integrated cockpit and driving/parking platforms, T-Box (4G/5G V2X Box), full LCD instrument clusters, OneCoreGo global mobility solutions, and

AR-HUD (augmented reality head-up display) systems. The NAGIC cockpit software platform allows flexible configurations to meet regional market needs, ensuring efficient product delivery.

- **Global network**:
  - Neusoft has a global R&D and delivery network with hubs in China, Germany, the United States, Japan and Malaysia.
- **Extensive ecological cooperation**:
  - Our automotive products are used in over 1,800 vehicle models across more than 110 countries, serving over 50 OEMs. We have partnerships with various ecological partners, including chip manufacturers and AI model providers, to deliver optimized solutions that enhance our clients' product competitiveness.

Which are Neusoft's main automotive partners for SDV projects in China?

Currently, Neusoft is collaborating with numerous OEMs on domestic SDV projects, including Geely, Changan, Chery, FAW and Great Wall, as well as several joint-venture OEMs and new-energy vehicle (NEV) startups.

In these collaborations, what technical or platform support does Neusoft provide? Does this include E/E architecture, operating systems, middleware, hypervisor, OTA or cybersecurity?

In our collaborations, Neusoft focuses on designing and building operating systems and software platforms, developing middleware and applications, creating OTA platforms, and establishing cybersecurity architectures. We also participate in discussions about electronic and electrical architectures, providing insights from a software perspective. These capabilities help us support the development of SDVs.

Neusoft's role goes beyond that of a standard technology supplier. We provide OEMs with comprehensive software solutions and services that cover everything from foundational architectures to upper-layer applications, including technical implementation, safety and compliance.

In China, in-vehicle software mainly focuses on application-layer software such as ADAS, smart cockpit/connected services, and AI, while Europe emphasizes foundational software and underlying architecture. How does Neusoft serve different regional markets based on these distinct customer needs?

Neusoft has a software development and delivery team with full-stack technical capabilities and global experience, enabling us to meet the diverse needs of different markets. Our independently developed in-vehicle software platform serves as a unified technical foundation, allowing us to provide customized, high-quality delivery services by flexibly allocating global resources. This approach helps us respond to the rapid iteration and innovation demands of the Chinese market while also meeting the strict standards for functional safety, information security and development processes required in Europe.

Europe is a key international market for Neusoft. After nearly 20 years of focused development, we have established a European R&D system based in Hamburg, Germany, supported by an R&D center in Romania. Neusoft is committed to providing comprehensive innovation support for European clients, covering user experience, technology R&D, and business model innovation to assist in their transformation in the SDV era.

Many automakers are currently promoting full-stack in-house development. From the perspective of a software partner, how do you view the evolving trend between automakers' in-house development and external sourcing?

In the future, OEMs and suppliers will move towards a cooperation model focused on "software specialization, collaborative innovation, and ecosystem co-construction." The traditional "hardware + software" black-box delivery model will decline, making way for cooperation based on software-as-a-product (SaaP) and Engineering and Integration Services (EIS).

Software suppliers need to shift from being just "suppliers" to becoming "enablers and co-creators" of OEMs' SDV innovations. This transition requires improving software capabilities, upgrading cooperation models, enhancing customization, and fostering ecosystem collaboration while investing in new technologies. By working closely with OEMs to define and develop products, and building relationships based on "complementary capabilities, risk sharing and value co-creation," software suppliers can maintain a competitive advantage during this industrial transformation.

From the perspective of a software provider, how are the costs of SDVs typically calculated? Is it based on software BOM cost, total cost of ownership (TCO) over the vehicle life cycle, or licensing fees?

From the perspective of software suppliers, the cost of SDVs is typically calculated based on the total cost of ownership (TCO) over the entire life cycle. For components that have independent intellectual property rights — whether developed in-house or procured externally — costs are either listed separately based on licensing fees or accounted for independently according to the number of licenses.

What organizational or operational changes and innovations do you think automakers need to implement to successfully launch SDV products?

Building software capabilities is a systematic project that requires ongoing investment. OEMs need to make comprehensive changes, including reshaping corporate culture, adjusting organizational structures, optimizing management models and strengthening ecological cooperation. These steps are crucial for creating an efficient development system that meets new requirements, supports agile development and rapid iteration, and allows decision-making processes to respond quickly to market demands.

- **Clarify strategic direction**: Developing software capabilities is an enterprise-level initiative that requires clear strategic planning and a commitment to long-term investment to ensure consistency and sustainability.
- **Reshape culture and organizational structure**: OEMs should create a culture focused on software. This means breaking down inter-departmental barriers, promoting collaboration among strategy, R&D, product, and supply chain teams, and integrating experts in areas like electronic and electrical architectures, hardware, basic software and application layers.
- **Strengthen ecological cooperation**: OEMs should work to build an open and collaborative industrial ecosystem by forming strong partnerships with software suppliers, chip manufacturers and technology companies. They should implement differentiated cooperation models for different partners and promote joint technology R&D and innovation to maximize ecosystem value.
- **Optimize the development system**: As hardware and software development become more decoupled, the software iteration cycle shortens significantly. OEMs need to create an agile and efficient development system to support the ongoing evolution of software functions and

quickly respond to user needs, enhancing the vehicle's digital experience.

How does Neusoft view the development trends of SDV over the next 5-10 years?

The automotive industry is moving quickly from function realization to experience-driven development. This shift will restructure the automotive value chain and enhance ecological cooperation. Profit and value creation will increasingly focus on software development, application ecosystems, and customer operations, moving away from traditional hardware manufacturing and sales. The distinction between tier 1 and tier 2 suppliers will blur, leading to cross-industry collaborations and new partnerships. Consequently, business models will evolve toward "software subscriptions + ongoing services," making it essential to maximize full life cycle value for profitability.

The SDV sector is currently entering a complex phase, with enterprises facing significant challenges related to agility and resilience. Future competition will focus on balancing innovation, speed and cost. For all stakeholders in the global automotive industry, it is vital to integrate complementary resources and strengths to build rational and mutually beneficial collaborative relationships.

Chinese technology providers have emerged as pioneers in the SDV space, thriving in a competitive market. Through extensive trial and error, they have gained valuable experience and developed strong competitiveness. As a result, they are poised to become significant contributors to the global transformation of SDVs in the future.

What specific initiatives has Neusoft undertaken to build the SDV ecosystem in China and Europe, respectively? For example, collaborations with automakers, chip vendors and software developers, as well as practices related to software ecosystem platforms, OTA updates and data services.

As SDVs gain prominence, Neusoft is enhancing its strategic initiatives to build an open, collaborative and mutually beneficial industrial ecosystem. We see SDV not just as a technological shift but as a change in the industrial paradigm, using software to connect the value chain among OEMs, ecological partners and users. Neusoft integrates its software expertise and innovative practices from the Chinese market into its global business strategy, supporting global OEMs and industrial partners.

With regional headquarters in Hamburg, Germany, and an R&D center in Romania, Neusoft has been established in Europe for nearly 20 years. We also leverage R&D bases in Shenyang, Dalian and Wuhan to create a comprehensive onshore-nearshore-offshore R&D, innovation, and delivery network that helps European clients advance software-driven cooperation models and improve their competitiveness.

- **Ecosystem Development for OneCoreGo Global In-Vehicle Intelligent Mobility Solution 6.0**: Neusoft actively promotes cross-regional and multilevel ecological cooperation:
    - We collaborate with leading global map and location service providers to offer navigation and mobility services in multiple regions and languages.
    - We partner with content ecosystem providers to create immersive in-vehicle digital experiences.
    - At the hardware integration level, we work with domestic HUD optical engine manufacturers to develop AR-HUD solutions that integrate virtual information with real driving scenarios, enhancing safety and human-machine interaction.

        - In data and services, we leverage our connected vehicle and big data capabilities to build a closed-loop data processing system from the vehicle to the cloud. This helps OEMs deepen data value mining, create user profiles, and innovate scenario-based services, shifting business models from "function delivery" to "software + services" and unlocking the core value of SDVs.
    - **Software services**: Neusoft has delivery teams with full-stack software capabilities in both China and Europe. These teams provide end-to-end engineering services tailored to clients' needs, including operating system design, middleware and application development, OTA platform construction, and cybersecurity architecture design and certification. Through collaborative models, such as Offshore Development Centers (ODCs) with customers, Neusoft plays a tier 0.5 role in certain projects, assisting OEMs with demand integration, supplier product verification, integration management, and final system delivery. We also strengthen partnerships with key players, including chip manufacturers and AI model providers, to offer integrated hardware-software and system-optimized solutions that enhance product competitiveness.
    - **Future commitment**: Neusoft will continue to invest in foundational software platforms, ecological system coconstruction and data-driven services. Our goal is to work closely with global OEMs and partners to build an open, sustainable and evolving automotive software ecosystem.

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