

Defining a Standardized SDV Maturity Framework

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In partnership with:



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An industry-neutral SDV roadmap

The automotive industry has reached three critical realizations about software-defined vehicles (SDVs). **First**, the transformation is inherently incremental rather than revolutionary. **Second**, companies find themselves at vastly different stages of this evolution. **Third**, without a clear understanding of their current position and the full scope of the journey ahead, organizations struggle to develop effective SDV strategies or prioritize their investments.

The SDV transition is fundamentally reshaping the automotive landscape. Yet, it is occurring unevenly and without a shared understanding of progress, creating an urgent need for a framework that clearly delineates different phases of SDV maturity.

Previous attempts to establish such frameworks have encountered two major limitations: they were typically influenced by vendor-specific biases that restricted broader applicability or were tailored primarily to European or Western market conditions, neglecting the diverse technological, regulatory, and consumer environments present in global markets.

Recognizing these limitations, Omdia conducted a global industry survey to establish a framework for SDV maturity assessment that strives to be as objective and universally applicable as possible.

The resulting framework provides the automotive industry with a credible common language for discussing SDV development—one that resonates across different

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segments, organizations and geographies. This research-backed approach offers organizations the clarity needed to assess their current position, understand the path forward, and make informed strategic decisions in their SDV journey.

The SDV maturity framework

The SDV maturity framework comprises four phases that evolve in terms of capability maturity and sophistication: **Connected**, **Augmented**, **Adaptive**, and **Agentic**.

Phase 1: connected

In the **Connected** phase, vehicles function as connected devices capable of receiving over-the-air (OTA) firmware updates only. The user experience remains static with no new functions added post-purchase. All other elements operate within the legacy automotive business model, and the OEM functions as a hardware manufacturer.

Example: A vehicle with embedded navigation capable of live traffic information. At this phase, the car offers less capability than a smartphone, leading many users to prefer phone mirroring solutions.

Phase 2: augmented

In the **Augmented** phase, vehicles become capable of adding functions after leaving the dealership. These functions are primarily restricted to infotainment domains, as this represents one of the easiest areas to begin software updates. The OEM initiates its software transformation, increases involvement in software development, defines software requirements for Tier 1 suppliers, and operates as a more significant hardware and software integrator.

Example: A vehicle with connected navigation featuring a voice assistant with controlled vocabulary that is later upgraded to natural language processing via OTA update. At this phase, the vehicle becomes more capable, although the user experience still does not surpass that of smartphones.

Phase 3: adaptive

Phase three, **Adaptive**, marks a significant milestone in which the Electrical/Electronic (E/E) architecture enables cross-domain functions, allowing the vehicle to become adaptive. This means the car can understand the user, context, and environment to make intelligent decisions.

Example: When a driver enters the car, the vehicle analyzes the user's data patterns and predicts that the driver is heading to the airport. Using information from the driver monitoring camera, it identifies that the driver is fatigued and suggests activating

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autopilot mode. Due to the detected tiredness, the vehicle enhances the sensitivity of its monitoring systems and ensures that hazard warnings are displayed clearly, with high-contrast visuals and audio alerts.

Additionally, the driving experience can continuously evolve through the remote activation of new capabilities, such as suspension tuning, enhanced acceleration modes, and specialized off-road configurations.

In this phase, the OEM operates as a software company, making strategic decisions based on the longevity of software and opportunities for value creation, rather than focusing solely on traditional material costs. The vehicle offers a superior, contextually aware user experience that eliminates the need for phone mirroring.

Phase 4: agentic

The fourth phase, **Agentic**, concentrates the user experience on intelligent agents rather than the car itself, with all connected devices seamlessly integrated, including phones and vehicles. The OEM operates as a mobility services provider, benefiting from cross-industry use cases.

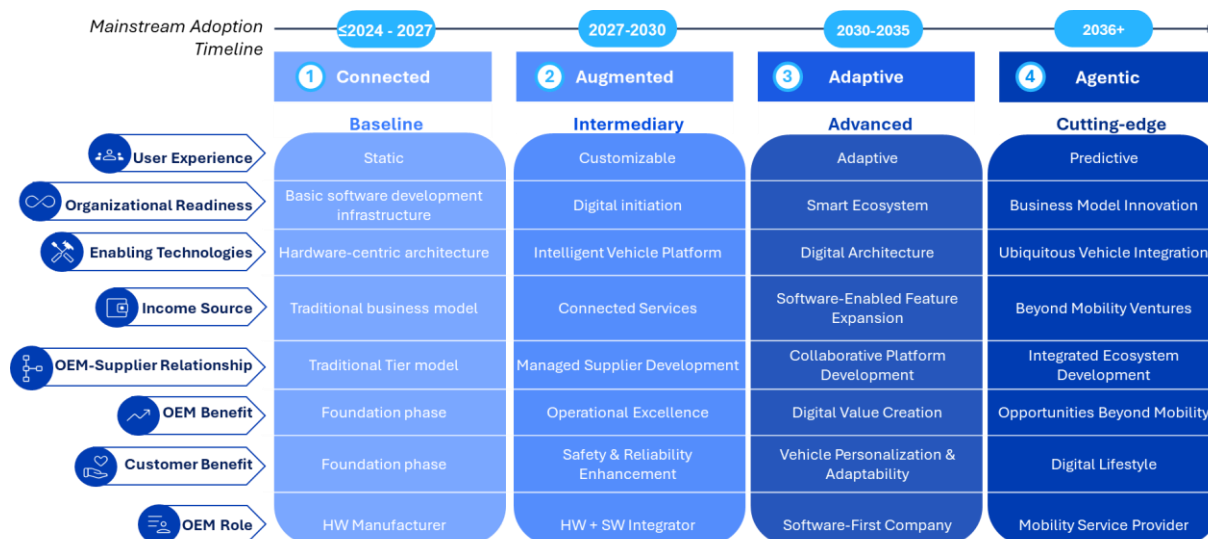
Example: Building on the previous scenario, the vehicle connects to the driver's smart ring, confirms fatigue levels, and activates SAE L4 autonomy. The car accesses the driver's calendar to identify the airline and flight details. By accessing real-time airport information, it is determined that the destination terminal is extremely busy, and based on up-to-date ETA calculations, it predicts that the driver will likely miss their flight. The car then verifies whether the driver has fast-track security access with their airline and, if not, proactively books fast-track security clearance. OEMs could also become fleet managers of robotaxis.

In this phase, value creation and business model opportunities are virtually limitless, enabling OEMs to define their competitive positioning and service offerings. Moreover, phase 4 represents complete ecosystem dependency, where success requires orchestrated collaboration across multiple industries, technology providers, and service platforms.

Naturally, the realization of this phase will depend on open and shared standards and data sharing between different entities, as well as careful attention to data privacy, which varies regionally. These foundational requirements will be critical enablers for the cross-platform integration and ecosystem participation that define the Agentic phase.

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Figure 1: SDV Maturity Framework



Note: n=647

Source: Omdia

Key dimensions and indicators

User experience

The user experience fundamentally transforms as vehicles progress through the four SDV maturity phases, representing a paradigm shift from traditional automotive interactions to sophisticated, context-aware digital experiences.

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Table 1: User Experience Features and Capabilities by SDV Phase

SDV Phases	UX	Features	Description
1. Connected	Static	OTA Updates	Infotainment systems receive OTA updates that fix security issues and ensure existing features remain operational throughout the vehicle's lifecycle. No new functionality is added beyond what was available at the time of purchase.
2. Augmented	Customizable	ADAS Maintenance	Systems receive OTA updates for security fixes and operational stability, maintaining original safety features without adding new capabilities.
		Infotainment Enhancement	Digital interfaces receive updates that add new features and improve functionality, continuously enhancing the user experience beyond the feature set available at vehicle purchase.
3. Adaptive	Contextually Aware & Adaptive	Driving Capability Expansion	Vehicles receive OTA updates that progressively enhance driver assistance and autonomous features, advancing safety and automation beyond initial purchase capabilities.
		Software Evolution	Manufacturers deliver consistent upgrades across all vehicle systems regardless of model year, creating a unified platform that evolves throughout ownership.
4. Agentic	Predictive & Proactive	Connected Ecosystem Integration	Vehicles establish seamless communication with city infrastructure, IoT networks, and personal devices while maintaining an open architecture that enables third-party.

Source: Omdia

Phase 1: Connected - Static Hardware Platform Experience

In the Connected phase, the user experience remains static, offering no enhancement beyond the original purchase configuration. The hardware-centric organizational and technological focus limits innovation to basic connectivity features, resulting in vehicles that function primarily as hardware platforms with minimal software capabilities. Users often find smartphones more capable and continue relying on phone mirroring for advanced functionality.

Phase 2: Augmented - Customizable Integration Experience

The Augmented phase introduces a customizable experience as OEMs evolve into hardware and software integrators. Organizations begin developing internal software capabilities, enabling vehicles to add new functions post-purchase, particularly in infotainment domains. This phase marks the introduction of L2+ automation, where vehicles begin offering enhanced driver assistance features.

However, the dual focus on hardware and software integration limits the scope of innovation. While this marks the beginning of software-driven value creation, the user experience still does not surpass smartphone functionality, representing incremental

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improvement driven by the OEM's emerging software competencies rather than transformational user value.

Phase 3: Adaptive - Contextually Aware and Adaptive Experience

A significant advancement occurs in the Adaptive phase, where OEMs transition to become software-first companies, with software capabilities driving product differentiation.

Universal software upgrades achieve the highest survey ratings (39%) in this phase, indicating that Phase 3 represents a crucial "iPhone moment" for the automotive industry. That means that OEMs provide consistent OTA updates across nearly all vehicle models, regardless of hardware variations or manufacturing years. However, there are practical limitations to this concept, as vehicle support eventually ceases for older models due to insufficient hardware capacity, outdated sensors, and inadequate computing infrastructure.

User experience becomes contextually aware and adaptive, as vehicles gain the intelligence to understand users, location, environmental contexts, and situational needs, allowing them to make decisions that enhance convenience and safety. In this phase, the incorporation of OTA autonomous driving features garners the highest survey ratings (40%), with the introduction of L2++ and L2+++ automation, which are continuously enhanced throughout the vehicle's lifetime.

Overall, the software-first mindset enables OEMs to create superior, integrated experiences that surpass the functionality of smartphones. At this stage, users begin to think less about their phones, marking a critical transition from phone-centric to vehicle-centric interactions. This shift represents a fundamental change in the automotive user experience paradigm.

Phase 4: Agentic - Predictive and Proactive Service Experience

The Agentic phase delivers a predictive and proactive user experience as OEMs complete their transformation into mobility service providers. Connected ecosystem integration shows the highest survey result in this phase (38%), validating the significant integration capabilities required in the agentic phase.

The service-oriented organizational model enables intelligent agents to orchestrate seamless interactions across connected devices and services, not only within the mobility realm but also across various industries. Vehicles achieve L4 automation capabilities, where the car handles most driving scenarios autonomously, fundamentally transforming the user experience from active driving to passive mobility consumption.

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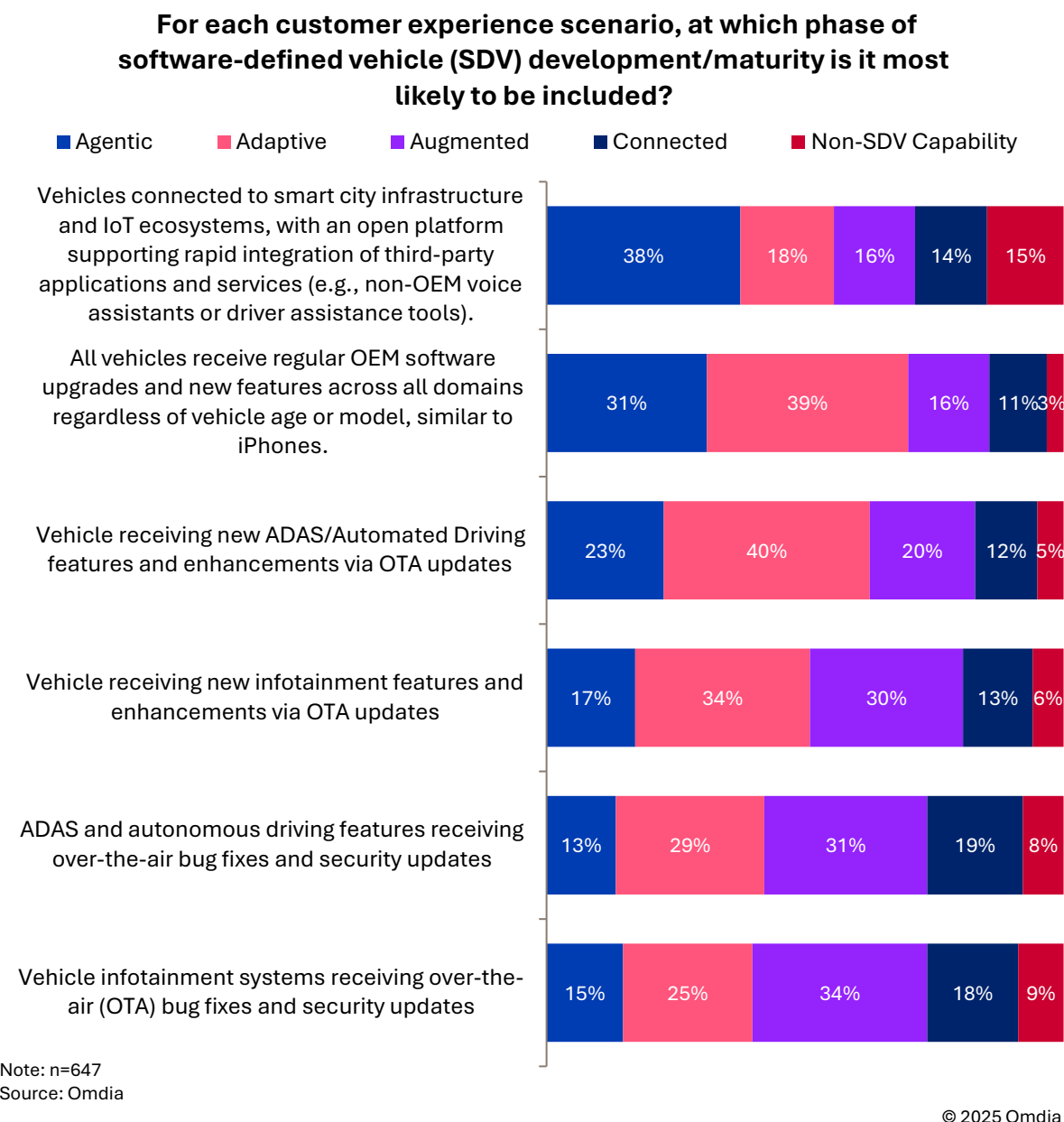
The vehicle anticipates user needs, makes decisions, and takes actions on their behalf, creating an ecosystem where the car becomes a mobility service platform rather than just a transportation device. This represents the ultimate realization of user experience transformation, where vehicles become an integral part of the overall mobility ecosystem and can also serve as intelligent lifestyle companions.

Survey results

The survey results demonstrate that while basic maintenance functions, such as bug fixes and security updates, are distributed across multiple phases, advanced capabilities, such as remote addition of autonomous driving features, universal updates, and cross-industry ecosystem integration, are predominantly associated with higher maturity phases.

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Figure 2: User Experience Classification by Maturity Phase



Organizational readiness

Many industry leaders have underestimated the critical role of organizational transformation in the development of SDVs. However, as many companies have discovered, Conway's Law applies: altering a vehicle's E/E architecture necessitates a fundamental change in how companies are structured, how teams collaborate internally, and how they engage with partners across the broader ecosystem.

It is now clear that organizational transformation is essential for the success of SDVs, requiring automotive companies to transition from traditional, manufacturing-focused structures to agile, software-centric organizations. This shift represents a complex

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change that demands a complete overhaul of business models, operational processes, technological capabilities, and cultural mindsets.

The challenge is compounded by the need for organizational adaptation. Employees accustomed to established workflows will require time and support to embrace new methodologies, while existing supplier relationships may need realignment to support a software-first approach.

Consequently, organizational readiness emerges as a multifaceted challenge that requires transformation not only within OEMs but across the entire ecosystem, as many suppliers who adjusted their operations to serve traditional OEM models are now facing similar organizational challenges.

Industry experts frequently observe that while the technology is ready, organizations are not—making organizational readiness one of the primary bottlenecks to achieving success with SDVs.

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Table 2: Organizational Readiness (O.R.) Features by SDV Phase

SDV Phases	Strategy	Structure	O.R.	O.R. Features	Description
1. Connected	Tech-Centric	Hierarchical	Basic software development infrastructure	-	CI/CD pipelines, DevOps practices, and automated testing frameworks
2. Augmented			Digital initiation	Data-Driven Decision Making	Customer-centric feedback loops to guide product improvements
				Ecosystem Partnership Development	Strategic collaborations with technology providers, content developers, and service partners to expand vehicle capabilities
				Digital Engineering Environments	Simulation platforms, virtual validation, and digital prototyping capabilities
3. Adaptive	UX-centric	Agile	Smart Ecosystem	Agile Organizational Structure	Cross-functional teams, flattened hierarchies, and collaborative methodologies.
				AI and Machine Learning Integration	Automated processes, predictive analytics, and intelligent decision support systems across business functions
				Digital Twin	Virtual representations for optimization and predictive analysis
4. Agentic			Business Model Innovation	-	Subscription services, feature-on-demand offerings, data monetization strategies, and TCO-based design approaches.

Source: Omdia

Phase 1: Connected - Hardware Manufacturing Foundation

In the Connected phase, OEMs primarily focus on hardware manufacturing while developing a basic software infrastructure. During this phase, they establish the foundational technology necessary for OTA update capabilities. This includes setting up continuous integration and continuous deployment (CI/CD) pipelines, implementing DevOps practices, and creating automated testing frameworks.

Organizational structures within traditional automotive companies remain essentially unchanged in this phase, with software viewed as a supporting element rather than a core competency.

Phase 2: Augmented - Digital Integration Initiation

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The Augmented phase marks digital initiation, where OEMs evolve into hardware and software integrators. Organizations start implementing data-driven decision-making processes through customer-centric feedback loops utilizing telemetry and usage analytics, while investing in digital engineering tools.

This phase also marks the beginning of ecosystem partnership development, where OEMs initiate strategic collaborations with technology providers, content developers, and service partners to expand vehicle capabilities. These partnerships represent the first steps toward recognizing that SDV success requires external collaboration beyond traditional supplier relationships.

Moreover, AI and machine learning integration shows significant representation at 36% in this phase, as companies begin adopting these technologies in a fragmented, experimental manner across isolated use cases.

The Augmented phase represents the first significant shift toward software-oriented thinking and processes while managing complex integration challenges between traditional hardware and emerging software competencies.

Phase 3: Adaptive - Software-First Transformation

A transformational leap occurs in the Adaptive phase, where OEMs transition to become software-first companies with software capabilities driving product differentiation and competitive advantage.

AI and machine learning integration achieves its strongest representation at 39% in this phase, with adoption becoming mainstream and strategically integrated, allowing organizations to unlock its full potential through enterprise-wide implementation. This demonstrates the critical importance of intelligent systems as organizations advance through the maturity framework.

Organizations also develop innovative ecosystem management capabilities through agile, rather than hierarchical, structures with cross-functional teams, strategic ecosystem partnerships, and digital twin technologies for comprehensive optimization. This phase requires substantial cultural change, marking the critical shift from tech-centric to user-centric organizations where customer experience becomes the primary driver of innovation.

Lastly, organizations begin thinking about Total Cost of Ownership (TCO) instead of Bill of Materials (BOM), recognizing processing power, sensor-set, and memory as opportunities rather than costs. This TCO thinking emerges naturally as OEMs transform into software companies, understanding that software-driven value creation extends far beyond the initial purchase and fundamentally changes how value is created and measured.

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Phase 4: Agentic - Complete Business Model Innovation

The Agentic phase signifies complete innovation in business models, transforming OEMs into mobility service providers. This phase shows the strongest survey results for business model innovation, at 45%, confirming the necessary fundamental transformation to operate as service-oriented technology companies.

In this phase, organizations implement subscription services, feature-on-demand offerings, sophisticated data monetization strategies, and TCO-based design approaches that create entirely new revenue streams and customer relationships.

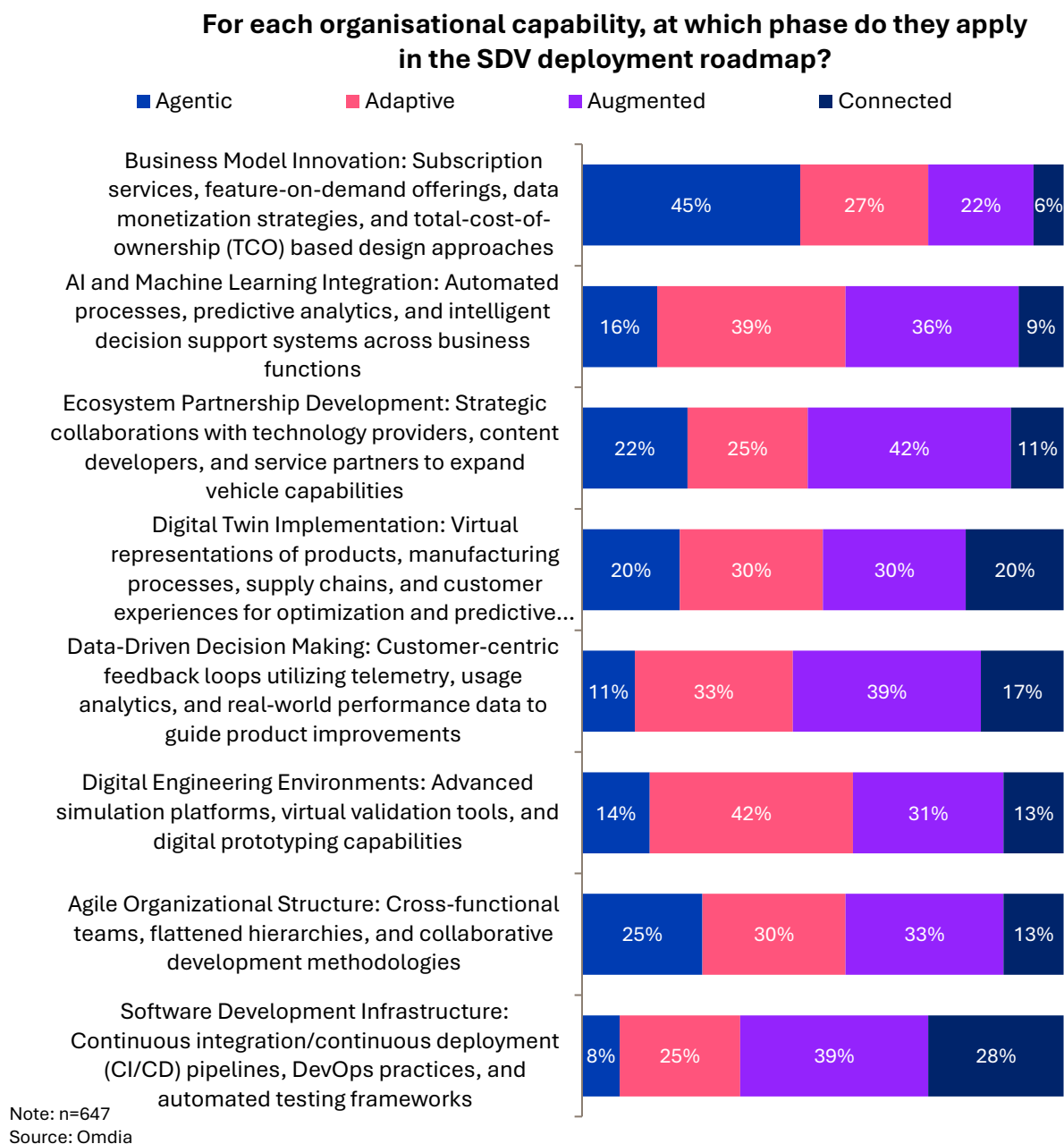
Success requires a fundamental reimagining of value creation and competitive positioning, with organizations mastering the balance between initial investments and long-term value through TCO-based designs, fully embracing their identity as service-oriented technology companies.

Survey results

The survey results reveal that foundational capabilities, such as software development infrastructure, are distributed across multiple phases, whereas advanced capabilities, including business model innovation, are predominantly concentrated in higher maturity phases. Moreover, the data clearly demonstrate a progressive complexity pattern, where elementary organizational changes enable more sophisticated transformations in subsequent phases.

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Figure 3: Organizational Readiness Classification by Maturity Phase



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Enabling technologies

The technological foundation of SDVs undergoes significant evolution across four maturity phases and is intrinsically linked to organizational transformation, directly enhancing user experiences throughout the SDV journey.

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Table 3: Enabling Technologies by SDV Phase

SDV Phases	Enabling Technologies	Description
1. Connected	Hardware-centric architecture	Specialized software (e.g., maps) for different vehicle functions: for example, one map for traffic, one for navigation, one for ADAS, and one for autonomy.
		Hybrid domain E/E architectures.
2. Augmented	Intelligent Vehicle Platform	Separate software (e.g., maps) per domain.
		Hybrid domain E/E architectures with higher consolidation.
3. Adaptive	Digital Architecture	Digital twins for lifecycle management.
		Digital twins for simulation and testing.
		Hybrid Zonal E/E architecture or Centralized Domain-based E/E architecture.
		Edge AI capabilities.
		Processing and memory headroom.
		Hardware and software abstraction (Automotive OS).
		High-speed in-vehicle network backbone.
		One software (e.g., map) layer across all vehicle domains.
4. Agentic	Ubiquitous Vehicle Integration	Integration with the IoT ecosystem and smart city infrastructure.
		One software (e.g., map) across mobility & digital life.
		Zonal E/E architecture with central compute.

Source: Omdia

Phase 1: Connected - Hardware-Centric Foundation

In the Connected phase, vehicles feature distributed E/E architectures beginning their evolution toward domain consolidation, typically starting with the cockpit domain. OEMs continue to operate with specialized software solutions tailored to individual electronic control units (ECUs), for example, using separate maps for traffic management, navigation, advanced driver assistance systems (ADAS), and autonomous functions. This technical fragmentation reflects the departmental structures that have historically defined automotive organizations.

During this phase, the E/E architecture and emerging software development capabilities limit innovation primarily to basic OTA update functionality, creating a largely static user experience with minimal dynamic adaptation.

Phase 2: Augmented - Intelligent Platform Integration

In the Augmented phase, OEMs evolve into hardware and software integrators, advancing ECU consolidation into hybrid domain E/E architectures with higher levels of integration.

This evolution typically expands beyond cockpit domains to encompass ADAS & Autonomous Driving (AV) domains. Reflecting this consolidation trend, 32% of survey

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respondents identify centralized domain-based E/E architectures as applicable to Phase 2, representing the second-highest response after Phase 3 (36%). Hence, fully centralized domain E/E architectures are not achieved until the subsequent phase.

Consequently, software architecture shifts from function-specific applications to domain-centric solutions. This architectural change enables OEMs to achieve deeper integration between functions within domains and deploy new capabilities OTA, particularly in cockpit applications.

This technological progression reflects enhanced software integration capabilities, enabling customizable user experiences that can expand functionality post-purchase while providing improved access to vehicle data and insights. However, the dual focus on hardware and software integration constrains innovation scope, typically yielding incremental improvements rather than transformational breakthroughs.

Phase 3: Adaptive - Digital Architecture Sophistication

The survey results identify the Adaptive phase as the primary stage of technology advancement, characterized by the highest concentration of sophisticated capabilities across multiple categories. This phase represents a significant technological leap where OEMs transition to become software-first companies.

This phase marks the evolution from digital engineering environments to digital twins for simulation and testing, achieving the highest response at 41%, alongside lifecycle management applications (35%). Digital twins demonstrate their critical importance for advanced virtual development capabilities and the shift-left process, which significantly reduces time to market.

Hardware and software abstraction (automotive OS) and domain-specific software solutions (e.g., maps) both achieve strong adoption at 40%, supporting the implementation of centralized domain E/E architectures (36%). Simultaneously, hybrid zonal E/E architectures gain significant traction (36%), enabling unified software layers across vehicles (36%) and high-speed in-vehicle network backbone implementation (35%).

Edge AI capabilities and processing/memory headroom show robust representation at 34% and 37% respectively, highlighting the essential role of intelligent processing and the need to deliver continuous value throughout the vehicle lifecycle. This represents a fundamental paradigm shift in automotive as organizations advance their software-first competencies.

This sophisticated technological foundation enables contextually aware and adaptive user experiences, where vehicles develop intelligence to understand both users and environmental context. The software-first organizational mindset drives technological

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choices toward flexibility, scalability, and continuous improvement capabilities, fundamentally transforming automotive technology conception and implementation.

Phase 4: Agentic - Ubiquitous Ecosystem Integration

The Agentic phase delivers ubiquitous vehicle integration technologies as OEMs complete their transformation into mobility service providers. Integration with the IoT ecosystem and smart city infrastructure shows the strongest classification at 34% in this phase, validating the critical importance of cross-industry connectivity, interoperability and collaboration.

The survey data reveal progressive consolidation of software architectures, with unified software solutions concentrating heavily in advanced phases (31% Agentic, 36% Adaptive). In the Agentic phase, vehicles integrate software layers across the entire mobility ecosystem—for example, a single map layer serving mobility applications (e.g., vehicles, public transport, two-wheelers) and digital life domains (e.g., smart rings, PCs, smartphones).

OEMs deploy zonal E/E architectures with central compute capabilities, enabling predictive and proactive user experiences where intelligent agents orchestrate seamless interactions across all connected devices and services. This reflects the organizational and technological evolution required to manage complex software integration systems, which remain challenging today.

The service-provider organizational model drives technological investments toward ecosystem integration, data analytics, and autonomous decision-making capabilities that support highly automated or fully autonomous mobility services.

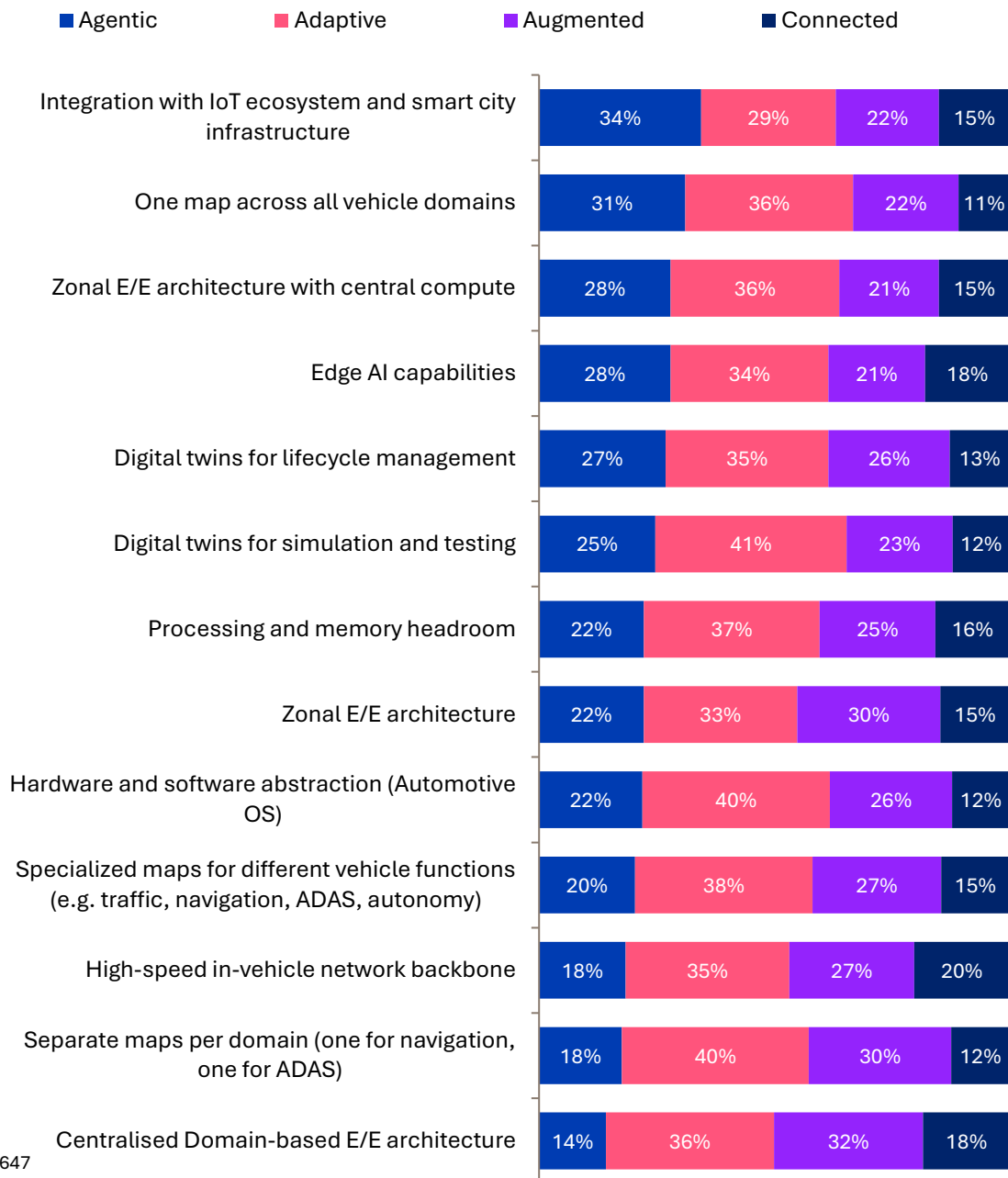
Survey results

The allocation of enabling technologies across SDV phases demonstrates a progressive complexity pattern, with foundational technologies distributed across multiple phases while advanced capabilities concentrate in higher maturity phases.

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Figure 4: Enabling Technology Classification by Maturity Phase

For each enabling technology, at which phase do they apply in the SDV deployment roadmap?



Note: n=647
Source: Omdia

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Customer benefit

The progression of SDVs reflects technological advancements and a fundamental shift in user interactions with vehicles as OEMs evolve in SDV maturity.

Table 4: Customer Benefit by SDV Phase

SDV Phases	Customer Benefit	Description
1. Connected	Foundation phase	Transitional milestone establishing technical groundwork.
2. Augmented	Safety & Reliability Enhancement	ADAS and autonomous driving features. For example, automated parking and highway assistance. Improved vehicle quality, safety, and longevity. For example, real-time diagnostics, fewer recalls, extended lifespan, and enhanced resale value.
3. Adaptive	Vehicle Personalization & Adaptability	Add and upgrade vehicle features throughout the lifecycle. For example, add features as a second or third owner. Personalization and customization. For example, profile settings, adaptive ambient lighting, and interior environment controls). Performance optimization. For example, adaptive suspension, performance tuning, and ride customization.
4. Agentic	Digital Lifestyle	Advanced in-vehicle entertainment ecosystem: for example, gaming, premium audio, and an app store with leading applications. Enhanced connectivity with personal digital ecosystem. For example, smartphone, smart home.

Source: Omdia

Phase 1: Connected - Foundation Investment Phase

In the Connected phase, user benefits remain limited as this represents a foundational stage focused on establishing technical infrastructure rather than delivering transformative value. As a transitional milestone, users experience minimal immediate benefits, with vehicles functioning primarily as connected hardware platforms rather than intelligent systems.

From the user perspective, this phase often feels like paying for potential rather than realized value. Promised connectivity benefits remain largely unrealized due to organizational and technological constraints inherent in hardware-focused business models, resulting in a gap between marketing promises and the actual user experience.

Phase 2: Augmented - Safety and Quality Enhancement

The Augmented phase delivers the first substantial user benefits through ADAS and AV features (up to L2+) that provide immediate safety and convenience improvements. Vehicle data analytics further enhance safety while delivering improved reliability and longevity through real-time diagnostics, reduced recalls, and new infotainment functionalities; all of which contribute to higher resale values.

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From the user perspective, this phase represents the first clear return on investment in SDV technology. Safety features and quality improvements directly impact daily driving experiences, while reducing long-term ownership costs and creating tangible value that users can experience and measure.

Phase 3: Adaptive - Performance Optimization and Lifetime Customization

A transformational shift occurs in the Adaptive phase as users gain the ability to add and upgrade vehicle features throughout the lifecycle, including as second or third owners, fundamentally changing the traditional automotive ownership model. These features span the entire vehicle rather than being limited to infotainment and ADAS, enabling an adaptive, driver-centric experience that encompasses core vehicle systems.

This translates into improved battery power estimation and whole vehicle energy management, enhanced cybersecurity, more accurate predictive maintenance across integrated systems, and the introduction of agentic AI that makes the vehicle feel smarter and delivers a more seamless user experience.

Enhanced connectivity with personal digital ecosystems demonstrates significant representation at 34% in this phase, indicating progressive development of integration capabilities. This enables comprehensive personalization through profile settings, adaptive ambient lighting, and interior environment controls, while performance optimization capabilities, such as adaptive suspension, performance tuning, and ride customization, provide continuous driving experience enhancement.

From the user perspective, this phase transforms the vehicle from a depreciating asset into an evolving platform that improves and adapts over time, creating unprecedented value retention and personalization opportunities that extend far beyond traditional automotive ownership models.

Phase 4: Agentic - Comprehensive Digital Lifestyle Integration

The Agentic phase represents the ultimate realization of user benefits, delivering comprehensive digital lifestyle integration and autonomy. Advanced in-vehicle entertainment ecosystems show the strongest classification at 42% in this phase, validating the unique nature of entertainment capabilities compared to earlier implementations.

While Adaptive phase entertainment focuses on personalization within the vehicle context, Agentic phase entertainment features seamless continuity across all digital touchpoints. Users can transition gaming sessions from home to vehicle, maintain consistent media experiences across devices, and access premium applications that leverage the vehicle's unique capabilities, such as spatial audio systems and high-

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resolution displays. The entertainment ecosystem becomes predictive and contextual, automatically adjusting content based on journey duration, passenger preferences, and destination activities.

This aligns with vehicle automation expected to reach Level 4 in this phase, eliminating the need for driver attention. Alternatively, dual-mode concepts are proposed, where drivers can choose between manual driving and autonomous operation based on their preferences and needs, as seen in companies like Tensor Robocar.

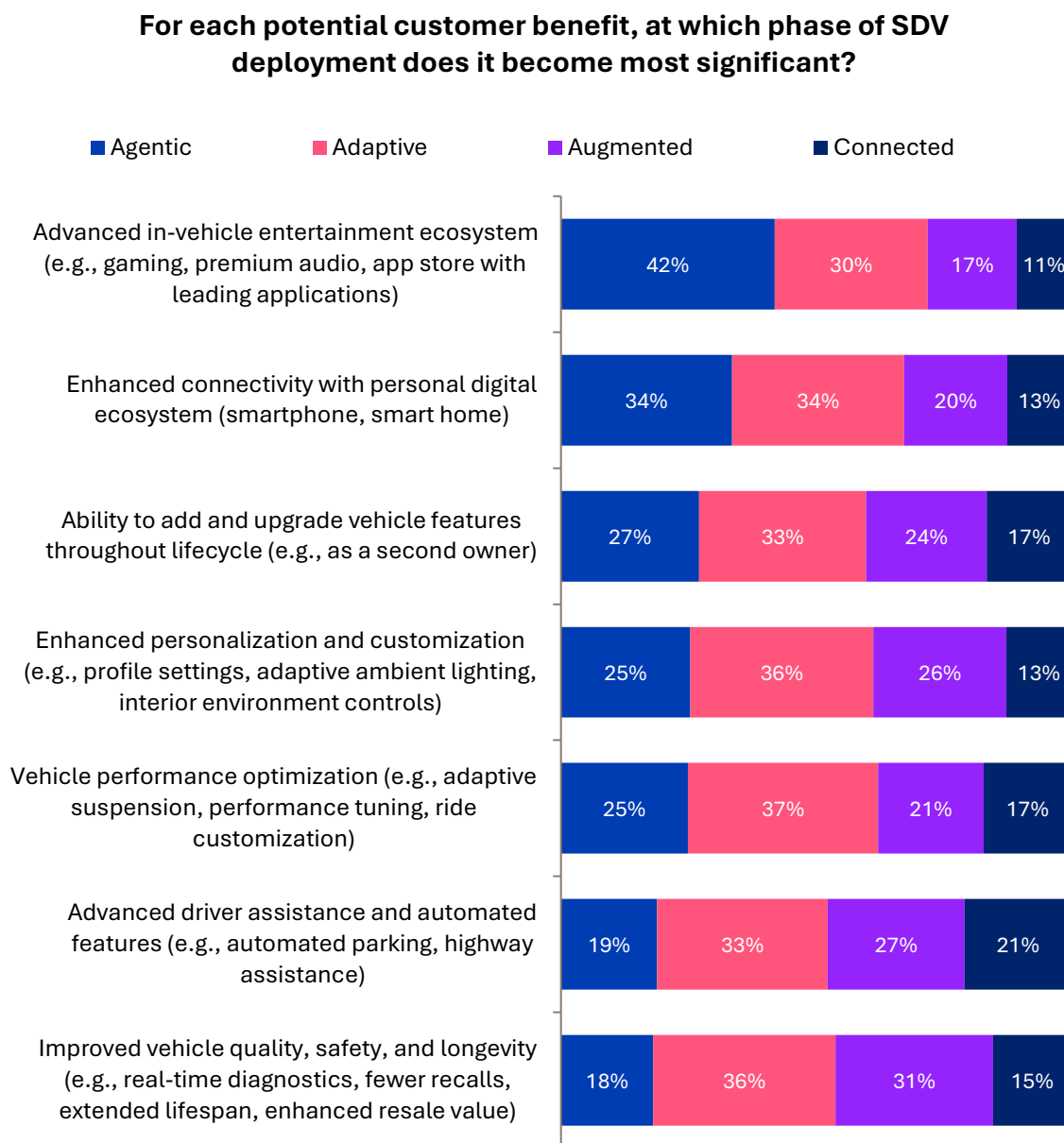
Enhanced connectivity with personal digital ecosystems maintains balanced representation at 34%, demonstrating the continued evolution of integration capabilities that transcend traditional automotive boundaries. From the user perspective, this phase eliminates boundaries between vehicle, home, and mobile experiences, creating a unified digital ecosystem where the car becomes an extension of personal digital identity rather than merely a transportation device.

Survey results

The results reveal that foundational benefits, such as safety and quality improvements, show a broader distribution across phases, while advanced lifestyle integration capabilities concentrate heavily in higher maturity phases.

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Figure 5: Customer Benefit Classification by Maturity Phase



Note: n=647
Source: Omdia

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OEM benefit

The strategic value proposition for OEMs evolves dramatically across the four SDV maturity phases, demonstrating that SDV represents a fundamental business model transformation rather than just a technological advancement. As organizations progress through the maturity phases, the value proposition shifts from operational efficiency to strategic differentiation, ultimately enabling entirely new business opportunities that extend far beyond traditional automotive industry boundaries.

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Table 5: OEM Benefit by SDV Phase

SDV Phases	OEM Benefit	Description
1. Connected	Foundation phase	Transitional milestone establishing technical groundwork.
2. Augmented	Operational Excellence	Better vehicle quality and safety (e.g., real-time diagnostics, fewer recalls). Lower development and production costs. Faster development and innovation cycles. Reduced BOM.
3. Adaptive	Digital Value Creation	Enhanced, personalized, and user-friendly UX. Increased long-term vehicle value: for example, continuous upgrades and higher residual value. New revenue streams from software and digital services. Vehicle data collection and monetization. Enhanced customer loyalty and engagement. Faster time-to-market for innovations and features.
4. Agentic	Opportunities Beyond Mobility	Unexplored frontier with transformative potential beyond current industry understanding.

Source: Omdia

Phase 1: Connected - Foundation Investment Phase

In the Connected phase, benefits remain limited as this represents a foundation phase focused on establishing technical groundwork rather than delivering immediate business value. The transitional milestone nature requires significant upfront investment in connectivity infrastructure and basic software capabilities, with little to no substantial short-term returns. From the OEM perspective, this phase represents necessary but costly preparation for future value creation, requiring organizational commitment to long-term transformation despite minimal immediate competitive advantage.

Phase 2: Augmented - Operational Excellence Emergence

The Augmented phase provides tangible benefits to OEMs as organizations realize incremental improvements in operations through greater efficiency and reduced costs, assuming proper implementation.

OEMs experience enhanced vehicle quality and safety through real-time diagnostics and reduced recalls (35%), which directly lowers warranty costs and strengthens brand reputation. Development and production costs decrease through improved integration capabilities and early software-driven optimization.

However, the benefits at this phase are still limited and may not provide a clear financial justification for investments in SDVs. Nonetheless, like Phase 1, this phase is essential for progressing to Phase 3, where significant returns are achievable. Notably, many OEMs that believe they are in this phase have not actually experienced these benefits, indicating that they have not fulfilled all elements and requirements of Phase 2.

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Phase 3: Adaptive - Transformational Value Creation Peak

The Adaptive phase unlocks digital value creation capabilities that fundamentally reshape business models and competitive dynamics. The survey data confirms this phase as the primary value creation stage, with the strongest concentration of transformational benefits across multiple categories.

Vehicle data monetization achieves its strongest result at 37%, validating the critical importance of data-driven business models. Enhanced personalized user experience demonstrates significant representation at 36%, indicating a transition from technology-centric pipelines to customer and user experience-centric development. These capabilities enable OEMs to achieve faster development and innovation cycles, reduce their bill of materials through software-driven functionality, and increase long-term vehicle value through continuous upgrades.

This phase also marks a strategic shift from B2B2C to B2C models, where enhanced customer engagement fosters direct relationships that bypass traditional dealer networks, allowing OEMs to capture greater value while responding more effectively to evolving customer needs.

Overall, this phase represents the most critical transformation point for OEMs, representing the shift from cost-based development to value-based differentiation through software capabilities rather than hardware specifications. Moreover, the ability to generate ongoing revenue streams through software and services fundamentally changes automotive business economics, transforming vehicles from one-time sales into platforms for continuous value creation. This is the **critical inflection point** where SDV investments deliver substantial returns and sustainable competitive advantages.

Phase 4: Agentic - Beyond Mobility Frontier

The Agentic phase represents an unexplored frontier with transformative potential as OEMs complete their evolution into mobility service providers, creating opportunities that extend far beyond current industry understanding. Enhanced personalized user experience maintains strong representation at 34% in this phase, demonstrating the progressive development of customer-centric capabilities that transcend traditional automotive boundaries.

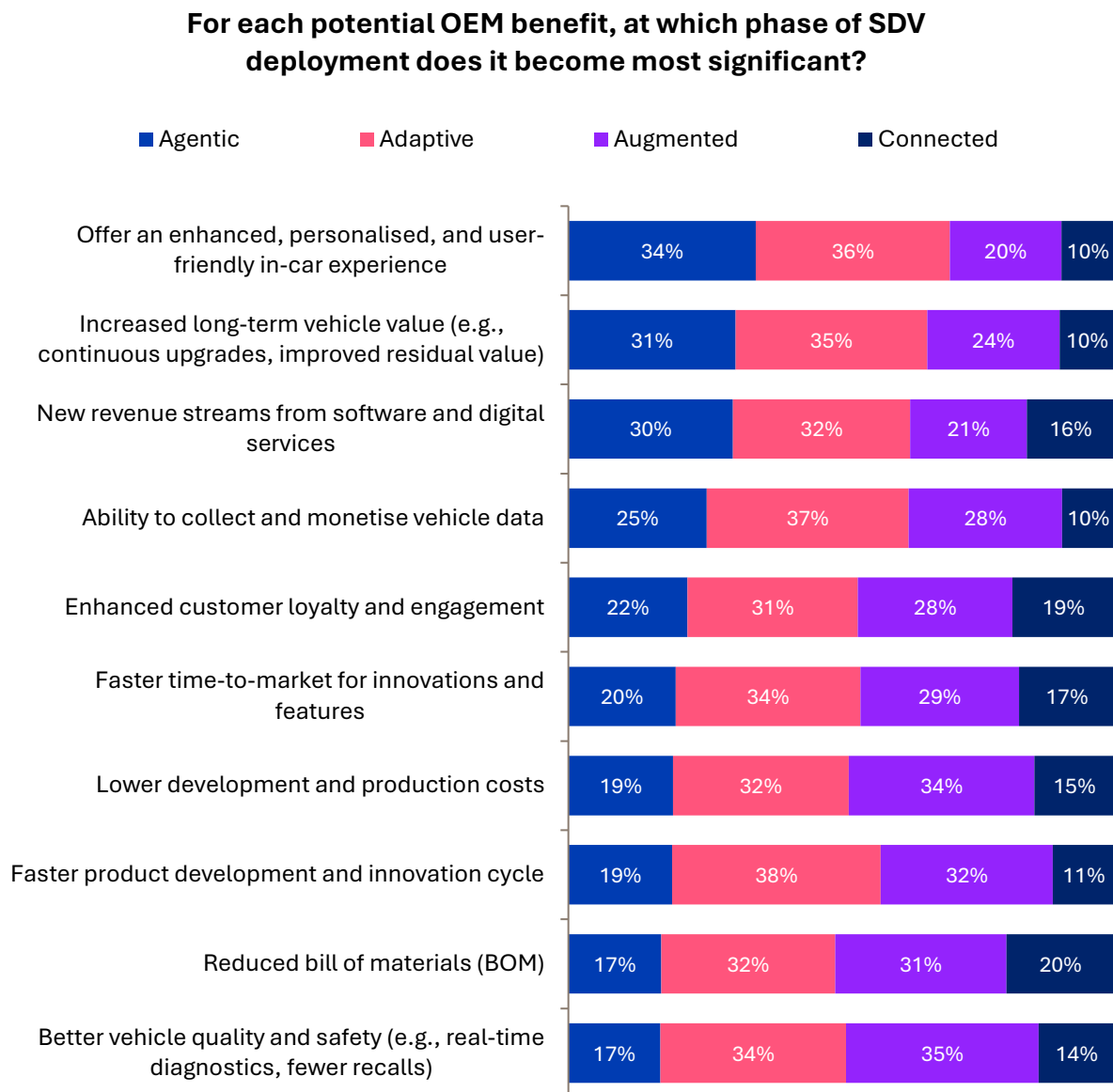
This phase enables OEMs to leverage their mobility platforms for participation in broader digital ecosystems, including smart cities, IoT integration, and comprehensive lifestyle services. It also prepares OEMs for a potential transition in vehicle ownership models from personal vehicles to robotaxis. The service-oriented business model creates recurring revenue opportunities and positions OEMs as technology companies rather than manufacturing entities, thereby fundamentally altering industry dynamics and competitive landscapes.

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Survey results

The survey results reveal that while basic operational improvements can be achieved in earlier phases, the most significant business transformation and competitive advantages concentrate in the Adaptive phase, where software-first organizational capabilities enable comprehensive digital value creation.

Figure 6: OEM Benefit Classification by Maturity Phase



Note: n=647
Source: Omdia

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Income source

This evolution of income sources within the SDV phases demonstrates how OEMs progressively diversify their revenue streams while simultaneously reducing operational costs, creating a compelling value proposition that justifies the substantial investments required for SDV transformation, especially in the early phases where returns are limited.

Table 6: Income Source by SDV Phase

SDV Phases	Income Source	Description
1. Connected	Traditional Business Model	Vehicle sales as primary revenue source; one-time transaction model.
2. Augmented	Connected Services	Fleet management.
3. Adaptive	Software-Enabled Feature Expansion	Selling features already installed in the vehicle that can be unlocked later by the customer, either as a one-time purchase or through a subscription.
		Commission from third-party function providers/payment services.
		Upselling features developed after sales.
		Connected services subscription.
4. Agentic	Beyond Mobility Ventures	Vehicle data monetization.
		New revenue streams beyond mobility, such as transaction fees from ecosystem orchestration services (e.g., renewable charging optimization), premium offerings based on cross-industry applications, and cross-industry revenue sharing models.

Source: Omdia

Phase 1: Connected - Legacy Business Model Foundation

In the Connected phase, vehicle sales are the dominant revenue source for OEMs (37%). This phase relies on a traditional business model where one-time transactions are the main source of income. Connectivity primarily serves as a foundation for future enhancements, rather than generating significant revenue, with limited monetization opportunities beyond the initial sale.

Phase 2: Augmented - Service-Enhanced Transition

The Augmented phase marks a transition from traditional product-centric models to service-enhanced business strategies. During this phase, automakers begin diversifying their revenue streams through fleet management solutions (32%). These solutions encompass fleet leasing programs, fleet replacement cycles, captive financing services, specialized insurance products, warranty extensions, and integrated fleet management platforms.

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This phase establishes the foundational infrastructure for sustainable recurring revenue models, while preserving traditional vehicle sales as a core revenue component. The strategic focus shifts toward building long-term customer relationships and creating predictable income streams that extend beyond the initial vehicle purchase.

However, the financial reality of the Augmented phase presents significant challenges. ROI remains constrained until automakers progress to Phase 3 and beyond, primarily because the value proposition delivered to customers during this transitional period is limited. This value gap restricts monetization opportunities and creates a challenging economic environment for automakers.

Ultimately, the Augmented phase serves as a crucial stepping stone, establishing the technological foundation and market positioning necessary for more profitable service-based models in later stages. Therefore, careful allocation of resources and effective stakeholder management are essential while preparing for future transformations.

Phase 3: Adaptive - Peak Revenue Diversification

The Adaptive phase represents the peak of diversified revenue streams across multiple categories, including software-enabled feature expansion through the sale of pre-installed features that customers can unlock later (38%), vehicle data monetization (34%), and post-sale feature upselling capabilities (33%). Moreover, connected services subscriptions (36%) finally deliver meaningful value to customers in this phase and establish themselves as a significant, recurring revenue source.

Overall, the Adaptive phase marks the critical inflection point where SDV investments begin generating substantial returns. The software-first approach enables continuous value creation that extends far beyond the initial vehicle sale, fundamentally transforming the traditional automotive business model.

Moreover, Phase 3 onwards, OEMs benefit from significant cost reductions, particularly in the TCO. These efficiencies stem from organizational readiness and enabling technologies that accelerate development cycles, enable extensive software reutilization, and optimize resource allocation.

The combination of diversified revenue streams and reduced operational costs creates a decisive economic advantage that validates and justifies earlier SDV investments, establishing a sustainable competitive moat for software-first automotive companies.

Phase 4: Agentic - Beyond Mobility Value Creation

The Agentic phase represents a fundamental shift toward entirely new value propositions. New business models outside traditional mobility show a 54% respondent rate in this phase, validating the ecosystem-centric approach.

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Beyond mobility ventures generate revenue through diverse channels, including transaction fees from ecosystem orchestration services, renewable charging optimization partnerships, premium wellness offerings such as stress-based navigation and health monitoring, and cross-industry partnerships with smart city infrastructure that create revenue-sharing opportunities. Additionally, OEMs can operate as fleet managers for consumer-targeted robocars and as robotaxi service providers.

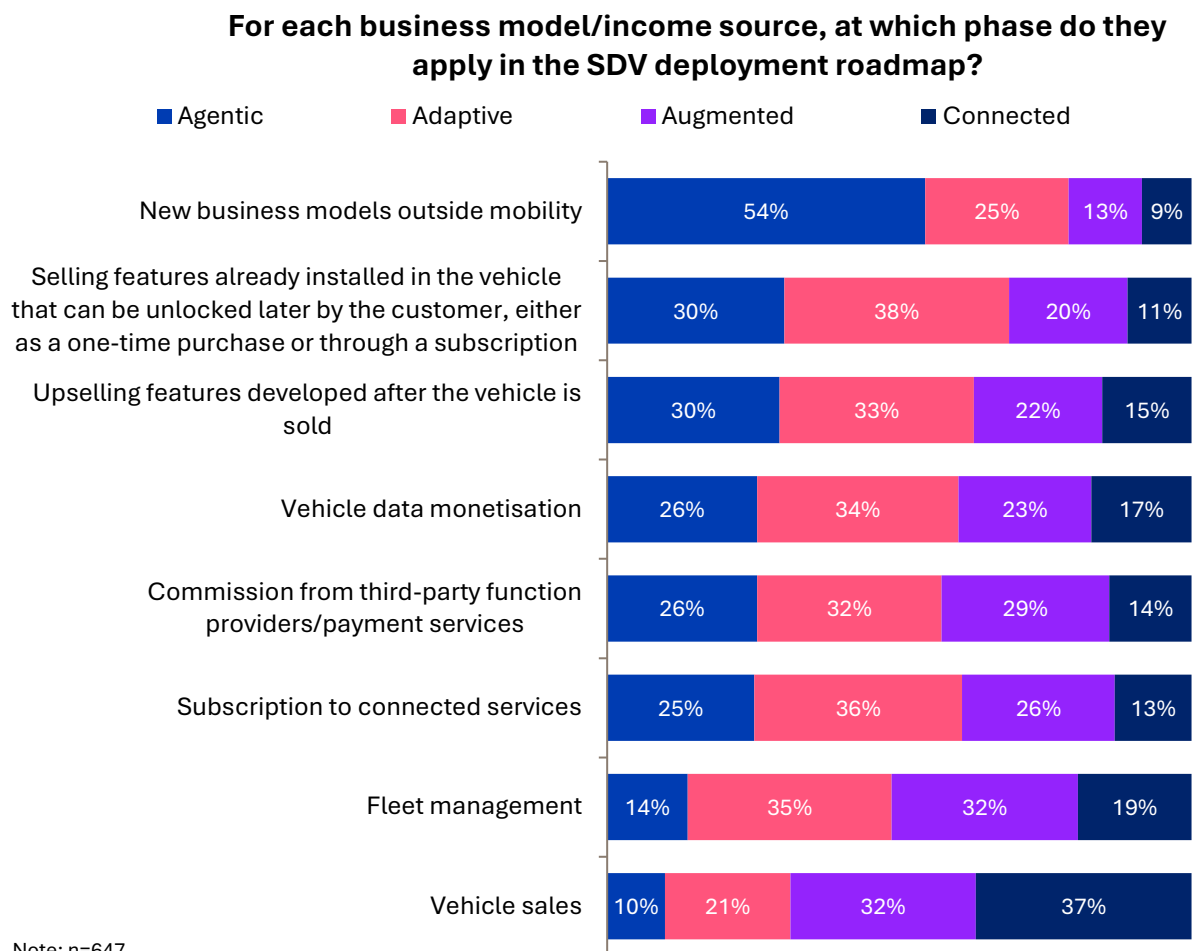
The agentic phase represents the ultimate realization of SDV potential, where vehicles evolve into intelligent, proactive platforms for lifestyle and mobility services that transcend traditional transportation boundaries. OEMs achieve complete business model innovation by leveraging their software-first capabilities to orchestrate complex service ecosystems that create value across multiple industries and customer touchpoints.

Survey results

While traditional vehicle sales maintain relevance across all phases, their relative importance diminishes as OEMs develop software-driven capabilities and service-oriented business models. The most transformative revenue opportunities concentrate in the Adaptive and Agentic phases, where software capabilities enable continuous value creation and ecosystem participation.

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Figure 7: Income Source Classification by Maturity Phase



Note: n=647
Source: Omdia

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OEM-supplier relationship

The transformation of OEMs through SDV phases requires a fundamental restructuring of automotive ecosystem relationships, evolving from traditional tiered supplier hierarchies to collaborative development partnerships and ultimately to orchestrated open ecosystems. This evolution demands OEMs to progressively transform their supplier engagement models while simultaneously building new capabilities for software-centric value creation.

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Table 7: OEM-Supplier Relationship by SDV Phase

SDV Phases	Ecosystem Structure	OEM-Supplier Relationship	Description
1. Connected	Tiered Relationships with Suppliers	Traditional Tier model	OEM manages all software development in-house, with suppliers providing hardware components.
2. Augmented		Managed Supplier Development	OEM defines software requirements while tier-1 suppliers develop and integrate software components.
3. Adaptive	Co-Development Ecosystem with Partners	Collaborative Platform Development	Shift toward partnership-based development models. OEMs and suppliers collaborate through shared development platforms with clear API interfaces.
			Shift toward shared development platforms with standardized interfaces. OEM and suppliers operate with continuous integration/continuous deployment pipelines across organizational boundaries.
4. Agentic		Beyond Mobility Ventures	OEMs and suppliers share real-time data and analytics to enable predictive maintenance and feature optimization. OEM orchestrates an open ecosystem where multiple suppliers contribute software modules through standardized interfaces.

Source: Omdia

Phase 1: Connected - Traditional Tier Model Foundation

According to the survey, the Connected phase is dominated by traditional tiered relationships between OEMs and suppliers, where OEMs manage feature-specific software development in-house while suppliers provide all components and ECUs (34%).

This legacy supplier relationship model reflects the hardware-centric organizational focus characteristic of traditional automotive manufacturers. Software capabilities remain limited and concentrated within the OEM, while suppliers function primarily as component providers rather than strategic technology partners.

This phase maintains familiar relationship structures that minimize organizational disruption while establishing foundational connectivity capabilities. However, the traditional approach has significant limitations: it constrains innovation potential and generates development bottlenecks as software complexity rapidly exceeds internal

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OEM capabilities. Moreover, the siloed structure becomes increasingly inadequate for managing the interdisciplinary collaboration required for advanced SDV development.

Phase 2: Augmented - Managed Supplier Development Transition

The Augmented phase introduces managed supplier development models where OEMs define software requirements while tier-1 suppliers develop and integrate software components (34%).

This transition marks the beginning of supplier involvement in software development while maintaining OEM control over requirements definition and system architecture. Suppliers begin developing software capabilities and integration expertise, but within clearly defined boundaries established by OEM specifications and oversight.

The managed development approach enables OEMs to leverage supplier expertise while maintaining strategic control over software direction. However, this model still reflects hierarchical relationships that limit collaborative innovation and shared risk-taking, which are necessary for advanced SDV capabilities.

Phase 3: Adaptive - Collaborative Platform Development

The Adaptive phase represents a fundamental shift toward co-development ecosystems. The strongest OEM-supplier relationship in this phase involves collaboration through shared development platforms with clear API interfaces (39%). OEMs and suppliers also operate with continuous integration/continuous deployment (CI/CD) pipelines across organizational boundaries (33%).

This transformation reflects the software-first organizational approach where OEMs recognize that mature SDV capabilities require collaborative innovation rather than hierarchical control. Shared development platforms and standardized interfaces established in this phase enable real-time collaboration and modular development approaches that become crucial for Phase 4 success.

The collaborative model creates mutual dependencies that align OEM and supplier incentives toward shared success while enabling faster innovation cycles and more sophisticated capability development than traditional approaches allow. It is here that suppliers evolve into true partners, working together with OEMs to continuously deliver and evolve value throughout the vehicle's lifecycle. As industry leaders now recognize, development begins—rather than ends—when the car leaves the dealership.

Phase 4: Agentic - Beyond Mobility Ecosystem Orchestration

The Agentic phase transforms automakers into ecosystem orchestrators rather than traditional manufacturers. OEMs and suppliers share real-time data and analytics to enable predictive maintenance and feature optimization (45%), representing the peak of

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data-driven partnership models. OEMs orchestrate open ecosystems where multiple suppliers contribute software modules through standardized interfaces (38%), demonstrating the shift toward platform-based ecosystem management.

OEMs evolve into mobility service providers that orchestrate comprehensive ecosystems of technology partners, service providers, and capability contributors. Suppliers transition from component providers to ecosystem participants, sharing responsibility for customer value creation and service delivery.

This ecosystem orchestration model enables unlimited scalability and innovation potential while creating new value streams through cross-industry partnerships and service integration that extends far beyond traditional automotive boundaries.

Building on Phase 3, software competencies reach unprecedented importance in the Agentic phase. Digital-native companies, even those outside the automotive sector, possess inherent advantages over traditional automotive players due to their software-first DNA and experience in ecosystem orchestration. **This creates an urgent imperative for automakers to develop strategic positioning immediately, determining how they will compete in this phase to prevent new entrants and disruptive competitors from capturing their market position.**

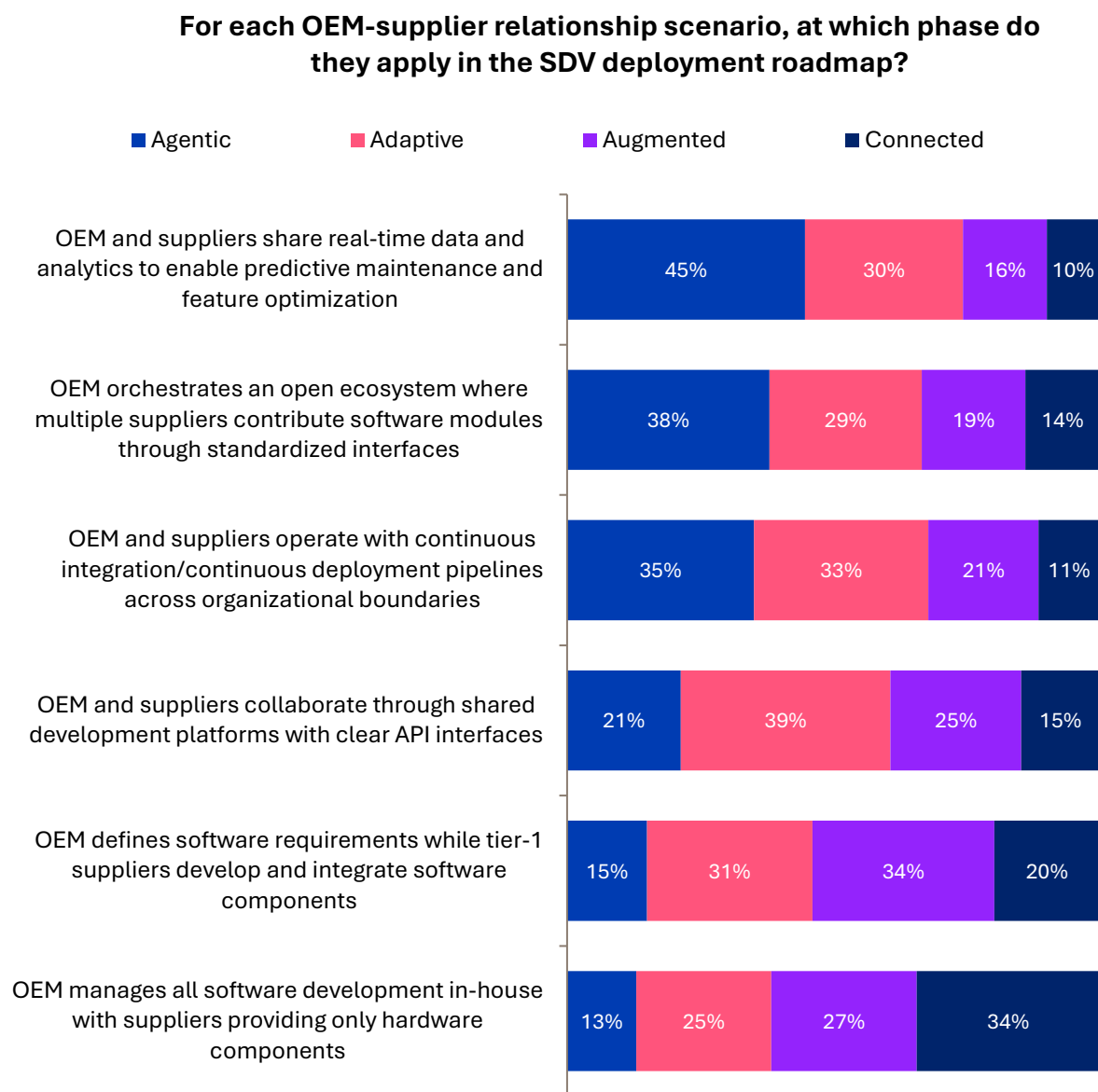
Survey results

Survey results reveal that traditional OEM-supplier relationships concentrate in the Connected and Augmented phases (34% each), demonstrating a gradual transition from legacy models. Collaborative development peaks in the Adaptive phase (39%), while ecosystem orchestration dominates the Agentic phase (45%).

Real-time data and analytics sharing shows the most dramatic progression, from just 10% in the Connected phase to 45% in the Agentic phase. This confirms that advanced SDV capabilities require unprecedented levels of information sharing and collaborative optimization between OEMs and suppliers.

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Figure 8: OEM-Supplier Classification by Maturity Phase



Note: n=647
Source: Omdia

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OEM role

Unlike previous dimensions measured through the survey, Omdia developed the OEM role dimension based on patterns observed across other SDV maturity spectrum dimensions and analysis of their strategic implications.

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Table 8: OEM Role by SDV Phase

SDV Phases	OEM-Role	Description
1. Connected	HW Manufacturer	OEMs function as traditional hardware manufacturers generating revenue primarily through dealership sales in B2B2C distribution models. Competitive differentiation centers on hardware excellence, including build quality, design aesthetics, engineering performance, and manufacturing reliability. Software capabilities remain limited to basic connectivity features that support core hardware functionality without creating independent value streams.
2. Augmented	HW + SW Integrator	OEMs evolve into hybrid organizations, developing initial software capabilities while maintaining hardware sales as the dominant revenue source. Organizations balance dual operational focus on manufacturing excellence and software integration, establishing foundational technology competencies through internal development and strategic partnerships to create enhanced customer experiences.
3. Adaptive	Software-First Company	OEMs complete their transformation into software-centric organizations, adopting software company business models that prioritize total cost of ownership optimization and recurring revenue generation over traditional BOM minimization. Strategic decisions focus on vehicle lifetime value creation through user-centric, data-driven approaches. OEMs leverage supply chain software expertise for non-differentiating technologies while focusing internal resources on software-derived competitive advantages built upon these foundational capabilities. Some OEMs opt for full vertical integration, though this approach remains heavily based on open platforms to ensure ecosystem compatibility.
4. Agentic	Mobility Service Provider	OEMs operate as mobility ecosystem orchestrators, functioning as software experts that integrate vehicles into expansive lifestyle and transportation service networks. Competitive advantages derive from advanced supply chain integration capabilities and ecosystem orchestration expertise, enabling service delivery that extends far beyond traditional transportation through cross-industry partnerships and platform-based business models.

Source: Omdia

The transformation of OEMs through SDV phases represents a fundamental redefinition of organizational identity and strategic positioning, evolving from traditional hardware manufacturers to mobility service providers. This evolution demonstrates how OEMs progressively transform their core business models, value propositions, and competitive advantages as they restructure operational approaches and customer relationships.

Phase 1 - Hardware Manufacturer

OEMs operate as hardware manufacturers, maintaining traditional automotive business models where revenue generation primarily occurs through dealership sales, with minimal direct business-to-consumer engagement. The business model remains fundamentally B2B2C, with dealerships serving as primary customer interface points.

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Competitive value propositions center on hardware attributes, including build quality, design excellence, engineering performance, and manufacturing reliability. Software capabilities remain limited to basic connectivity features that support hardware functionality rather than creating independent value streams.

Phase 2- Hardware and Software Integrator

OEMs evolve into hardware and software integrators, marking the initial transition from pure hardware focus toward software-enhanced value propositions. This transitional role enables the capture of software-driven value while leveraging existing hardware manufacturing strengths, although it creates organizational complexity as companies manage fundamentally different business model requirements simultaneously.

Phase 3 - Software-First Company

OEMs become software-first companies, adopting comprehensive software business models that prioritize TCO optimization over BOM cost minimization. Strategic decisions focus on vehicle lifetime value creation and software-driven revenue opportunities. The software-first approach establishes user experience-centric, B2C, data-driven organizational cultures where competitive advantages derive from software capabilities rather than hardware attributes.

Phase 4 - Mobility Service Provider

OEMs transform into mobility service providers—software experts that integrate vehicles into comprehensive mobility and lifestyle ecosystems. Competitive advantages derive from supply chain integration and ecosystem orchestration expertise, extending beyond transportation through cross-industry partnerships. OEMs function as platform orchestrators enabling seamless interactions between vehicles, infrastructure, services, and user devices.

Key takeaways

- **From Static Hardware to Dynamic Digital Experiences:** The user experience evolution demonstrates that SDV transformation fundamentally redefines the relationship between users and vehicles, progressing from static hardware interactions to dynamic, intelligent service experiences. The strongest capabilities are concentrated in the Adaptive and Agentic phases, particularly in universal software upgrades and connected ecosystem integration, confirming these as critical inflection points where organizational maturity enables transformational user value creation. The progression from phone-centric to vehicle-centric interaction in the Adaptive phase represents a fundamental paradigm shift that validates software-first organizational transformation, while the proactive capabilities of the Agentic phase demonstrate the ultimate potential of mobility services.

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- **Organizational DNA Must Transform, Not Just Technology:** SDV success depends not merely on technological advancement but on fundamental organizational transformation that aligns company structure, culture, and capabilities with software-first thinking and service-oriented business models. The strongest organizational capabilities are again concentrated in the Adaptive and Agentic phases, particularly in AI integration and business model innovation, confirming these as critical inflection points where organizational maturity enables sustainable competitive advantages.

The transformation from hardware manufacturer to mobility service provider represents a complete reimagining of automotive companies' core identity and value proposition, requiring organizations to master the balance between traditional automotive excellence and cutting-edge software capabilities while embracing TCO-based thinking that fundamentally changes how value is created, measured, and delivered.

- **Technology as Strategic Capability, Not Just Implementation:** The technological evolution across SDV phases demonstrates that enabling technologies are strategic organizational capabilities that reflect and allow the fundamental transformation of automotive companies. The most substantial technology advancements are concentrated in the Adaptive phase, supported by comprehensive industry validation, confirming this phase as the critical inflection point where technological sophistication enables sustainable competitive advantages and comprehensive digital value creation.
- **Vehicles Become Platforms for Digital Life Enhancement:** The evolution of user benefits demonstrates that SDVs represent more than technological advancement. They embody a fundamental reimagining of the relationship between users and their mobility solutions. As OEMs progress through organizational transformation, the value proposition shifts from incremental improvements to comprehensive lifestyle integration, ultimately delivering on the promise of vehicles as platforms for digital life enhancement. The Agentic phase demonstrated the strongest user benefits among all phases, particularly in entertainment ecosystem capabilities. This confirms that this phase represents the ultimate realization of SDV potential, where vehicles go beyond mere transportation to become integral components of users' digital lifestyles.
- **Business Model Revolution Beyond Automotive Boundaries:** The evolution of OEM benefits demonstrates that SDVs require a significant business model transformation rather than merely technological advancement. As organizations progress through maturity phases, the value proposition shifts from operational efficiency to strategic differentiation, ultimately enabling entirely new business opportunities that extend far beyond traditional automotive boundaries. The Adaptive phase represents the critical inflection point where SDV investments deliver substantial returns and sustainable competitive advantages, supported by strong survey validation across multiple benefit categories.

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- From Manufacturing Revenue to Service-Centric Value Creation:** The progression through SDV phases demonstrates a clear evolution from single-source revenue dependence to diversified income portfolios. The most transformative revenue opportunities are concentrated in the Adaptive and Agentic phases, where software capabilities enable continuous value creation and ecosystem participation. **The combination of new revenue streams and significant cost reductions from Phase 3 onwards creates a compelling business case for SDV transformation.** This revenue evolution reflects the fundamental shift from manufacturing-centric to service-centric value propositions, positioning successful OEMs as technology companies that happen to manufacture vehicles rather than traditional automotive manufacturers attempting to add software capabilities.



Critical implementation principles

Timeline interpretation and market entry strategy

- Mainstream Adoption Versus Market Availability Distinction:** Phase timeline references represent mainstream market adoption rather than initial technology availability. Leading OEMs currently operate across Phases 2 and 3, with mainstream adoption following several years after the initial market introduction. This temporal gap creates strategic opportunities for early adopters while establishing realistic expectations for transformation timelines.
- Early Investment Imperative:** Organizations must initiate SDV transformation investments prior to mainstream adoption to maintain competitive positioning. SDV transformation requires substantial time investment for organizational change, technological infrastructure development, and cultural evolution. Delayed initiation results in competitive disadvantages that become increasingly difficult to overcome as market maturity advances.

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Market entry pathway differentiation

- **Incumbent OEMs:** Established manufacturers and brownfield operations typically initiate transformation in Phase 1, building upon existing infrastructure while managing legacy system constraints and organizational inertia. This pathway requires comprehensive change management, but it leverages the existing market position and customer relationships.
- **Greenfield Market Entry:** New market entrants and disruptive organizations can bypass early phases entirely, implementing advanced capabilities without legacy constraints. This approach requires substantial upfront investment and risk tolerance but enables competitive advantages through superior initial positioning.

Strategic destination flexibility and competitive positioning

- **Optimal Endpoint Determination:** Organizations must align SDV transformation objectives with brand positioning, target customer segments, and competitive differentiation strategies. For example, Phase 4 achievement is not universally required for success; strategic value creation depends on matching capabilities with market positioning rather than pursuing maximum technological sophistication.
- **Future Evolution Considerations:** Phase 4 represents current technological and business model vision limits. Additional phases may emerge as SDV concepts mature and breakthrough technologies enable unforeseen capabilities. Strategic planning must incorporate flexibility for future developments while maintaining focus on current transformation requirements.

Sequential progression requirements

- **Multi-Dimensional Advancement Requirements:** Phase progression requires simultaneous achievement across all framework dimensions: organizational readiness, enabling technologies, supplier relationship evolution, user experience enhancement, and strategic role transformation. Partial advancement across selected dimensions does not constitute phase completion and creates implementation vulnerabilities. For example, deploying sophisticated SDV platforms (Phase 3) while maintaining a hardware manufacturer's organizational culture indicates a Phase 2 positioning, regardless of technological capabilities.
- **Implementation Risk Factors:** Incomplete phase progression results in organizational misalignment with technological capabilities, customer experience inconsistencies, increased development costs and timeline delays, and competitive disadvantages due to incomplete value propositions.
- **Phase-Skipping Prohibition:** Attempting to bypass intermediate phases without completing foundational requirements creates exponentially complex implementation challenges and cost escalation. Each phase establishes critical

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capabilities required for subsequent advancement, making sequential progression essential for sustainable transformation success.

Implementation discipline

- **Honest Self-Assessment Foundation:** Successful SDV transformation begins with an objective evaluation of current organizational capabilities, technological infrastructure, and market positioning. Organizations must resist the temptation to overestimate their current maturity levels and instead focus on building solid foundations for sustainable growth and advancement. Organizations must conduct objective assessments of current capabilities across all framework dimensions rather than relying on aspirational positioning. Critical evaluation questions include: Are organizational stakeholders and customers experiencing expected benefits from the assumed maturity phase? If expected benefits are not being realized, actual phase positioning requires reassessment.
- **Multi-Stakeholder Validation:** Successful implementation requires validation from multiple perspectives, including internal organizational assessment, customer experience feedback, supplier relationship evaluation, and competitive positioning analysis. Discrepancies between internal assessment and external validation indicate implementation gaps requiring attention.
- **Sequential Progression Commitment:** Organizations should commit to thorough completion of each phase's requirements rather than rushing toward advanced capabilities. Sustainable competitive advantage emerges from comprehensive transformation rather than superficial technological implementation.
- **Flexibility Within Structure:** While maintaining disciplined sequential progression, organizations must build flexibility into strategic planning to accommodate future technological developments and market evolution beyond the current Phase 4 vision.
- **Resource Allocation and Timeline Management:** SDV transformation requires substantial resource commitment across extended timeframes. Organizations must establish realistic timelines, allocate sufficient resources, and maintain transformation momentum despite inevitable implementation challenges and market pressures.

Conclusions

The SDV Maturity Framework provides a comprehensive roadmap for automotive industry transformation; however, successful implementation requires an understanding that this journey represents a fundamental business model evolution rather than incremental technological advancement. Organizations must commit to sequential progression, comprehensive transformation across all framework dimensions, and continuous honest assessment of transformation progress.

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The key to sustainable success lies not in accelerating toward advanced phases, but in thoroughly completing each phase's comprehensive requirements while building organizational capabilities necessary for long-term competitive advantage in the software-defined mobility ecosystem. Organizations that adopt this disciplined approach will be well-positioned to capture the substantial value creation opportunities that SDV transformation enables, while those that attempt shortcuts or incomplete implementations will face escalating challenges and competitive disadvantages.

Success in SDV transformation ultimately depends on organizational commitment to fundamental change, strategic patience for comprehensive development, and disciplined execution of transformation requirements across all framework dimensions. The framework provides the roadmap; organizational discipline and strategic commitment determine implementation success.

Appendix

Methodology

Sample composition

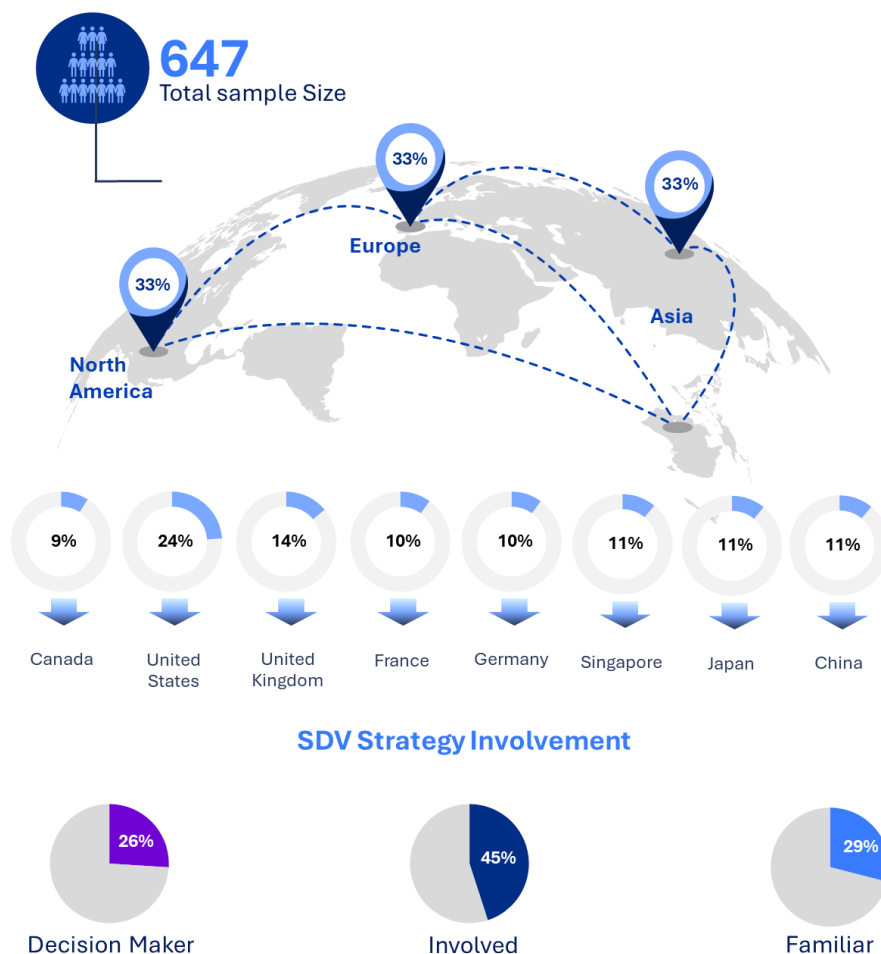
Omdia conducted a comprehensive survey of 647 industry experts across eight countries spanning North America, Europe, and Asia in July 2025. The research followed rigorous quality control measures to ensure data integrity, resulting in the elimination of 11 responses that did not meet quality standards.

All respondents possess at a minimum familiarity with their company's SDV strategy, with 45% actively involved in or contributing to their organization's SDV strategic development.

Moreover, this research adheres to established market research standards and practices, with a sample size sufficient to deliver statistically significant insights across geographic regions and company types within the automotive value chain.

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Figure 9: Survey Sample



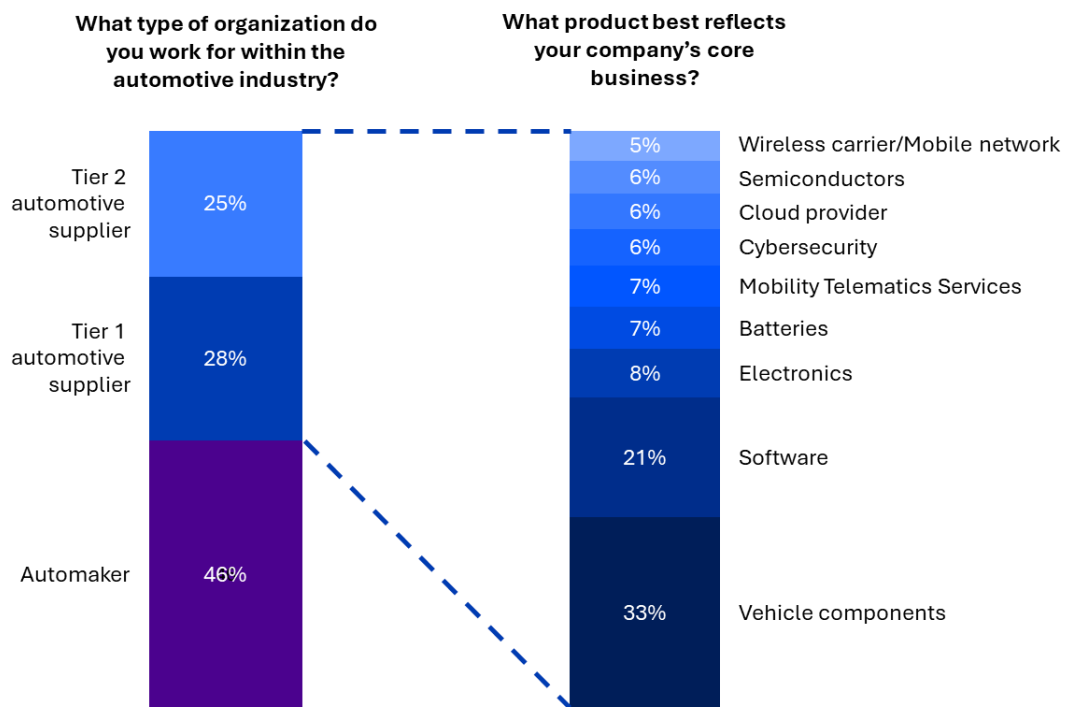
Source: Omdia

The study strives to represent the automotive ecosystem broadly, including OEMs and Tier 1 and Tier 2 suppliers, with 33% of supplier respondents specializing in components and 21% in software development. The research is further enriched by insights from semiconductor manufacturers, cloud providers, wireless carriers, and other critical enablers of SDV transformation.

This diverse respondent profile ensures the framework integrates both traditional automotive expertise and emerging technology perspectives essential for successful SDV implementation, providing a comprehensive foundation for industry-wide applicability.

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Figure 10: Respondent Profile



Source: Omdia

Data analysis

Respondents evaluated different scenarios and elements across seven key dimensions: user experience (UX), organizational readiness, enabling technology, income source, OEM-supplier relationship, OEM benefit, and customer benefit. They classified these elements within appropriate SDV development phases based on their industry experience and organizational context.

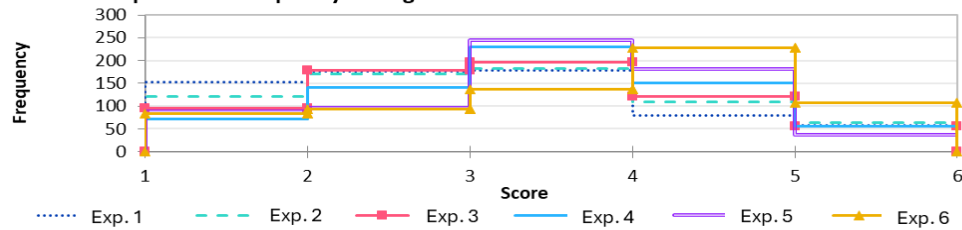
Comprehensive statistical analysis, including K-sample tests, T-tests, and frequency comparisons, revealed:

- Distinct frequency distributions across response categories, confirming the existence of different SDV maturity phases
- Conclusive evidence supporting four distinct SDV development phases (Figure 11 demonstrates the results for SDV user experience)

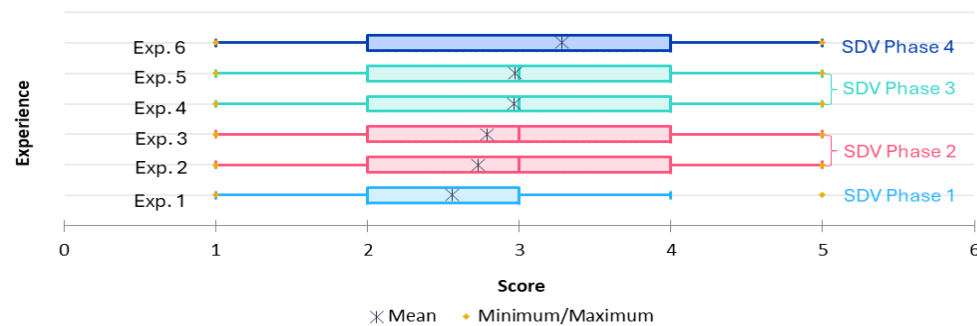
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Figure 11: Data Analysis

Vehicle User Experience: Frequency Histograms



Vehicle User Experience: Box Plots



Note: n=647
Source: Omdia

Based on how the four phases differed from each other across the seven elements, Omdia leveraged its industry knowledge and conducted expert consultations to define specific OEM roles within each phase. The role of the OEM then became the eighth element of each phase, completing the framework structure.

This data-driven approach validates theoretical concepts against real-world industry conditions, establishing a robust and broadly applicable SDV maturity framework grounded in empirical evidence.

Further reading

[At IAA Mobility 2025, a picture of the automotive industry's digital transformation comes into focus](#) (September 2025)

[Software-Defined Vehicle Survey 2025](#) (May 2025)

[SDV Market Tracker – 2024 Analysis](#) (December 2024)



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