Developing an Intelligent Mobility Ecosystem

Micro yet Mighty – Innovations Power the Future of Mobility
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Swiss innovation powerhouse Rinspeed AG recently introduced the microSNAP, a smaller version of its original SNAP concept car. The foundation of the SNAP family of vehicles is a skateboard-style chassis, which includes the hardware and software that powers autonomous driving. A separate pod can be added to the chassis and used for a dedicated purpose, such as passenger transport, last-mile delivery, or services related to retail, entertainment, or energy. Pods can be interchanged based on demand. The SNAP vehicle family represents a flexible, effective, and sustainable approach to address the challenges of new mobility.
Emerging technologies, changing consumer preferences, unsustainable vehicle use, and sector convergence are forcing players across the automotive and transportation value chain to transform the way they operate. Established players, new market entrants, startups, and technology companies are redefining transportation as they work to deliver integrated, on-demand, personalized, and autonomous mobility.

With this evolution, the motorized vehicle may change more in the next decade than it has in the last century.
Connected, autonomous, shared, and electric – the CASE attributes – transform the way cars are designed, developed, manufactured, and deployed. And these changes will extend far beyond vehicles. A new ecosystem of connectedness and capability will drive simpler logistics, cleaner propulsion, and smarter cities.

Yet these opportunities come with incredible challenges. How do we collaborate effectively to provide a seamless mobility experience for consumers? Who will own and operate mobility assets? How will organizations collect and integrate the data generated by connected vehicles, manage payments for services, and incorporate data-driven insights into those services? What is the best way to orchestrate intelligent and sustainable last-mile delivery in urban areas?

In the digital economy, no company can address these challenges alone. The SNAP project uniquely demonstrates how multiple partners can cooperate and co-innovate to deliver mobility on a global scale. The 2019 microSNAP project uses intelligent software solutions from SAP – including mobility, transportation, and supply chain management – which are optimized by technologies such as the Internet of Things, blockchain, machine learning, and artificial intelligence.

The family of SNAP concept vehicles has become a proving ground for a new mobility ecosystem. And SAP stands ready to empower business leaders to connect, automate, and innovate while developing the next generation of mobility solutions.

Read on to learn how you might use our tools – and our partnership – to reimagine mobility and develop your strategy for the future. Find information and guidance on using SAP® solutions so that together we can seize the opportunities ahead.

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The Role of Intelligent Mobility in Smart Cities

In 1990, there were 10 cities with 10 million inhabitants or more; by 2014, the number of “megacities” had reached 28. By 2050, nearly two-thirds of humanity will call a city home.¹ Cities are centers of innovation and economic progress. However, cities are also where many of our greatest challenges – including traffic congestion, aging infrastructure, pollution, and access to safe and convenient mobility for all – can negatively impact quality of life.

Rising to these challenges, the public and private sectors are turning to powerful technology to make cities smarter. These cities will leverage data, connectivity, and live analysis

to bring together livability and prosperity. Smart mobility solutions will offer residents, visitors, logistics companies, and mobility planners an ease of experience that preemptively addresses their transport needs, desires, and requirements.

One way that smart cities can improve urban living is to support shared mobility. To simplify lives and increase flexibility in urban areas, cities can deploy intelligent mobility solutions. In addition to flexible carsharing, these solutions can support connected logistics that optimize traffic volumes generated by increased goods delivery and other on-demand, mobility-related offerings such as medical services. End-to-end mobility-as-a-service (MaaS) solutions provide the functionality that allows citizens to plan, book, and pay for these offerings.

The microSNAP vehicle is designed to be a vital component of smart cities. Given its modular design and high degree of connectivity and integration into an urban data ecosystem, a fleet of microSNAP vehicles can provide everything from mobility services to new approaches in medical services, energy management, and entertainment.

Enterprises that embrace the smart mobility revolution will empower city planners, public transportation companies, logistic providers, and many other stakeholders across the city’s ecosystem to realize the benefits of CASE.
Mobility is not solely about vehicles. Instead, it extends to any moving asset and involves the hardware, software, connectivity, processes, and services that meld the physical and digital. As mobility technologies and applications evolve, enhanced efficiencies and new business models will develop. Collaborative transportation models such as ridesharing and carsharing, mobility as a service, multi-modal mobility, crowdsourced traffic information, and sensor-enabled traffic monitoring and management are just the beginning.
The maturing mobility ecosystem will rely on complex and highly interconnected value networks to create sustainable mobility strategies. These networks include physical and digital platforms that will be operated and used by a multitude of players from various industries.

Data and digitalization reside at the core of mobility. In 2017, automotive executives identified connectivity and digitalization as the year’s second-most-important trend, just behind battery-powered electric vehicles. And 84% believe that creating value from vehicle and consumer Big Data is the foundation for future business models.²

As the mobility market matures, industry boundaries will increasingly blur through collaboration between players from multiple industries. SAP provides solutions that animate and sustain these complex business models. For example, intelligent SAP® technologies can help extend digital capabilities throughout the mobility ecosystem – optimizing fleet management, logistics, infrastructure, and smart city management.

In addition, our platform strategy helps enable and optimize next-generation mobility efficiencies and business models. This comprehensive approach empowers companies to complement physical products with digital solutions – while maintaining smooth process flows and implementing new business scenarios quickly and flexibly.

The microSNAP concept is a powerful example of what is possible when stakeholders such as Rinspeed, SAP, and others join forces. With interchangeable, snap-together components that can be customized to meet any mobility need, microSNAP vehicles can move people, transport packages, or deliver services in an instant. Powered by data, shaped by design, and brought to life by business, the SNAP family of vehicles illustrates the true potential of mobility.

The automotive industry has long functioned across an ecosystem of designers, manufacturers, suppliers, and component makers. But an emerging mobility ecosystem is integrating startups, established players, and new entrants from other industries.

From Internet of Things (IoT) sensors to ubiquitous connectivity and from mobile apps to machine learning, an ecosystem of mobility will underpin every aspect of automotive products, services, processes, and business models. In fact, 82% of automotive executives absolutely or partly agree that a car now requires its very own ecosystem or operating system.
And 85% say the digital ecosystem will generate higher revenues than the hardware of the car itself.³

The microSNAP project exemplifies this mobility ecosystem by connecting vehicles to services and consumers to businesses in real time. The result will be personalized offerings that deliver unparalleled functionality, efficiency, safety, and convenience.

What’s more, the mobility ecosystem will offer quantifiable benefits to business and society. Advantages include reduced traffic, faster commutes, less pollution, decreased transportation costs, and a more resilient logistics infrastructure.

Transit time will become personal or productive time, providing people the opportunity to access personalized services from shopping to health monitoring. In a world of autonomous vehicles, connected fleets will become more efficient and will also support new business models.

Such advances are made possible by applications and technologies for intelligent enterprises. Complementary to the core capabilities of SAP S/4HANA®, innovative SAP solutions integrate future-facing technologies and capabilities – such as the IoT, machine learning, blockchain, and advanced analytics – that enable companies to quickly and flexibly innovate, integrate, and scale.

Market-leading companies must possess an intimate knowledge of every customer touch point. They will augment that knowledge with social, demographic, and external data (either situational or contextual) to understand customer preferences. Using artificial intelligence (AI), chatbots, and augmented reality, enterprises will be able to significantly enhance their customer interactions. Well-designed and well-executed services will allow companies to interact with their customers constantly and seamlessly using multiple channels. By leveraging data...
from all connected devices, organizations can develop a 360-degree view of each customer, including all channel interactions and communications. Based on this data, companies can provide a personal, tailored, and seamless mobility experience to their customers.

With the consent of the consumer, ecosystem partners will exchange vehicle and customer data, creating mutual benefit. New partnerships will form across industry boundaries, encouraging collaboration among companies in the automotive, retail, utilities, finance and insurance, and healthcare industries, to name a few. By improving customer interaction, every provider – from fleet operators and mobility service providers to ridesharing services and subscription providers – will maximize revenue and profits while providing a premium consumer experience.

The SAP Customer Experience portfolio can help companies realize their customer service and mobility goals. By offering a scalable platform that customers can use to access automotive services, our solutions help provide a unified experience of your brand.

SAP Customer Experience solutions include the cloud-based technology needed to build services that connect your business to the future – whether you want to provide a new driver portal, take payment for mobility services in the car, or develop an account framework for subscription-based vehicle services. Using the intelligent solutions offered with SAP Customer Experience, you can cultivate customers for life and become a trusted partner of your customers.
In the connected future, users and vehicles will generate vast quantities of valuable data. Monetization of this information through new e-commerce models can unlock significant revenue streams for both vehicle manufacturers and service providers.

By taking advantage of SAP solutions and technologies, companies can create an open mobility-data platform that manages and orchestrates data from consumers, vehicle manufacturers, and service providers. The platform...
enables the rapid development of new products and services at low cost through common components. It also supports top-line growth by allowing new revenue streams to integrate quickly into the e-commerce model.

Ecosystem members can use an open, scalable mobility business network from SAP. Based on our technical and business expertise, our network enables partners to seamlessly interact and transact business in a trusted marketplace.

Building on our deep, long-standing relationships with service providers across industry verticals, SAP can help enterprises transform the automobile from a simple instrument of motion into a portal that unlocks radically new consumer experiences. Our tailored, comprehensive solutions help ecosystem members reap the rewards of mobility without an extensive investment in platforms or networks.

By subscribing to a scalable mobility network, service providers gain access to a substantial customer base without the hassle of negotiating hundreds of separate agreements with dozens of automotive OEMs or fleet operators. Through the mobility platform and business network, SAP offers partners the solutions that help them deliver the mobility services customers value most.
As consumers increasingly turn to e-commerce for all their shopping needs, speedy fulfillment isn’t just a “nice to have” — it’s the expectation for every online shopping experience. As a result, businesses are developing new technologies and intelligent supply chain models to increase parcel volume, expedite deliveries, and delight customers.

Achieving sustainable and convenient delivery models requires intelligent supply chain solutions that revolutionize last-mile delivery in urban areas. Innovative organizations are developing delivery and distribution hubs in strategic locations and connecting these hubs using automated supply chain routes.
For example, in 2013, various retailers, logistics organizations, and technology companies founded an association called Cargo Sous Terrain (CST) to create an automated, digitalized logistics system for Switzerland. The system will include underground, intercity freight transportation; urban last-mile distribution; and an integrated IT solution to manage, operate, and maintain the overall network.

Freight transportation can be moved underground into a tunnel system that connects all major hubs in the region. Supply chain execution solutions from SAP can support seamless transportation operations, and transportation management offerings can enable maximum logistics efficiencies.

Instead of transporting goods in large, multiton truckloads, companies could support continuous transport flow of smaller units of up to two pallets. These compact units could be delivered to their final destination using microSNAP vehicles, drones, or bicycle couriers. Reducing the delivery size would significantly increase the flexibility of last-mile delivery while shrinking planning cycles.

As a shareholder of CST and a key player in the urban logistics project, SAP enables the initiative with line-of-business solutions extended by intelligent technologies, such as IoT services for real-time monitoring of tunnel vehicles, machine learning for demand forecasting, and blockchain for automated negotiation of transportation contracts.
Artificial Intelligence and data science play a major role in redefining the automotive value chain and the associated mobility trends. These technologies enable real-time, reliable, and consistent learning that helps automotive companies address trends such as autonomous driving, vehicle-to-vehicle and vehicle-to-infrastructure connectivity and communication, and electrification and shared mobility.

The asset-intensive automotive industry is one of the faster adopters of AI. The data created by vehicles and their associated functions provides numerous opportunities to reduce
costs and improve operations. This data enables automotive companies to pursue new business models and increase overall revenue.

Our data science platform provides a holistic environment for data scientists to create, train, operationalize, and scale machine learning models and incorporate them in business applications. This foundation helps our customers advance their digitalization journey and enable process automation.

This data science foundation provides:
- Data-based insights and data-driven value, creating cost- and time-efficient processes
- AI-based process automation that reduces the need for manual labor and eliminates mundane tasks
- Deeper and tighter integration to front- and back-office IT systems in cloud, on-premise, or hybrid environments, thus infusing machine learning into the digital enterprise

**Automotive Industry Use Cases**

A data science platform supports various lines of business, helping organizations manage AI at scale. Common use cases include:

- **Predictive analytics and maintenance** – Identify potential maintenance issues and schedule proactive service for vehicles or fleets based on data received from sensors

- **Autonomous driving** – Recognize patterns in traffic, road conditions, and driver behavior through machine learning to increase safety and reduce human error, thus providing a state-of-the-art driving experience
As the number of electric vehicles grows, the ability to effectively manage energy assets becomes a priority for companies, cities and municipalities, and consumers. Any organization with a fleet of vehicles needs to gain insight into how that fleet is managed, the way each asset consumes energy, the capability of the charging infrastructure to meet demand, and the value of participating in energy trading. Fleets can include a variety of vehicles, including automobiles, buses, trucks, shop-floor robotics, and cargo transporters.
With intelligent charging management, electric vehicles are available and ready to go when people need them; for example, when employees are ready to drive home from work or when orders need to be delivered. But intelligent management goes well beyond charging activities. Organizations need to address issues such as energy optimization, which considers the health of assets and cost concerns. Billing solutions for electric vehicles and mobility services can help electric mobility to become self-sustaining. Security solutions are needed to protect data assets and user privacy. And trading functionality can enable participation in energy markets.

To date, there has been little cooperation or collaboration among industries that share an interest in electric mobility. Utilities, automotive manufacturers, and high-tech companies have each been focused on building their own solutions to the challenges of energy asset management.

SAP has the technological capabilities to support collaboration among these players and deliver the solutions needed to support various intelligence management disciplines. We also have cross-industry expertise and insights that allow us to connect representatives from numerous industries, creating a holistic approach to electric mobility. Using artificial intelligence, machine learning, and sophisticated algorithms, our solutions can help organizations deploy renewable, carbon-neutral energy assets that meet the need for smart energy management. And, ultimately, contribute to making our world more sustainable.
The microSNAP concept gives us a peek at the possibilities for the mobility of tomorrow. But the mobility revolution will extend far beyond vehicles. It will inspire new ways of consuming transport. New kinds of connectivity will drive simpler logistics, cleaner energy, smarter cities, and a higher quality of life. Through this innovation, our world will experience a mobility ecosystem of connectedness and capability.
With the mass adoption of cloud, Big Data, and mobile technologies over the last 20 years, enterprises are generating an overwhelming volume of data. But most of them are unable to leverage this data effectively. To make sense of all the noise, draw meaningful insights from their data, and dynamically allocate resources, our customers must become intelligent enterprises.

Intelligent enterprises operate with visibility, focus, and agility to achieve game-changing outcomes. They redefine the end-to-end customer experience. They deliver a step change in productivity. They transform workforce engagement. Members of the mobility ecosystem must bring intelligence to their vehicles, products, services, and infrastructure.

At SAP, our vision is to deliver the Intelligent Enterprise for our customers so they can achieve their desired outcomes and make the world run better. With SAP’s comprehensive portfolio of products and technology innovations, we can deliver on this vision through a new generation of intelligent business processes and business models that support the future of mobility.

Learn More
For more information about mobility challenges and solutions, visit us at www.sap.com/industries/automotive.