Industry Vision: Digitalizing Engagements
Evolve the Automotive Industry Toward Mobility

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Digital value chains created through frameworks such as Industrie 4.0 empower business transformation from automotive platforms toward mobility concepts. CIOs will learn that competitive disruption will come from service entrants and new industries that link mobility data to user experience.

Key Findings

- The mobility industry is being transformed by building comprehensive data value streams from various sources in the vehicle, as well as from the driving environment and business models.
- Mobility assumes there are applications that can provide the optimized and most satisfactory way to obtain the experience of the location, from different modes of transportation all the way to virtual reality, with services being the mode of trading and navigation.
- Insights from data in vehicles and the environment have lowered market entry barriers for nontraditional service companies, as the industry business model moves from physical objects, the vehicle and the transportation device to an information and service-level-based mobility portfolio.
- Mobility and the connected car as a data marketplace have been leading Google and Apple to invest heavily in technology to leverage those data flows for efficiency in their service creation.

Recommendations

- Create a new business culture in which IT leverages data to understand new market models and builds new applications and service ecosystems to engage or compete with adjacent service entrants.
- Build new data marketplaces using standard data methodologies in order to leverage data from the environment, service partners and customer segments to create competitive experiences.
Leverage predictive analytics and sensors to create a continuous stream of performance data that, linked to market data, will empower innovation and variances of design on hardware and software closer to market demands.

Invest in social media and crowdsourcing technology to gain faster access to market dynamics and customer communications.

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Analysis

CIOs expect that 37% of enterprise revenue will come from digital business by 2020, more than double the 16% it was in late 2015, according to Gartner’s 2015 CIO survey. To hit this level, CIOs will need to help their organizations change the basis of competition, create new markets and cross industry boundaries by creating an industry vision for digital business (see "Create an Industry Vision for Digital Business"). This approach enables the enterprise to tilt the fundamentals of competition in its favor without limiting digital business to narrow sequences of events and committing the enterprise to a vast building project. One possible industry vision is turning your business into a platform.
An Industry Vision Changes Everything

An industry vision proposes nothing less than the complete redefinition of the enterprise, as well as the industry. It is one vision of many that could be possible for any given industry. The purpose of an industry vision is to stretch thinking about what is possible. An industry vision should make all but the luminaries feel uncomfortable, because it is a total rethink of how value is created and delivered.

Mobility: Driving New Service Models and Industrial Transformation

Mobility is a game changer for the transportation and vehicle industry and therefore a good example of an Industrie 4.0 leading industry vision (see Appendix section for the definition of Industrie 4.0). Transportation and logistics are focused on delivering goods and people to different locations, with the automotive sector developing the vehicles that transport them to those locations. Key metrics for transportation are distance traveled and volume delivered. In comparison, mobility describes the convergence of requirements for objects and people to have access to places and locations and the physical and virtual means for getting there (see Figure 1). Mobility assumes there are applications that can provide the optimized and most satisfactory way to obtain the experience of the location, through different modes of transportation — all the way to virtual reality — with services being the mode of trading and navigation.

Figure 1. Competitive Thrust Through Mobility

The traditional transportation industry sector is extremely competitive, and so far, differentiation is based mainly on hardware. However, many automotive companies have started to create systematic strategies to expand differentiation based on the diagnosis and telematics of the hardware. They are also generating service businesses that include electric mobility, along with adjacent service models such as car sharing and new mobility concepts that change the ownership
of vehicles altogether. That transformation has become necessary, as mandates toward CO₂ reductions and changes in end-user markets toward car ownership have had a big impact on innovation management and business strategy in OEMs such as BMW, Mercedes and Audi.

In commercial OEMs such as Scania and MAN, the hardware is managed based on capacity, efficiency in distance, tolls, insurance and idle time. The transformation of the industry is expedited through data streams from various sources in the vehicle, as well as the driving environment, which includes street furniture. Insights from the data augment decisions based on analytics on drivers, roadways, traffic patterns and fleet logistics requirements. Social factors, including environmental behavior, electric mobility and an emerging sharing economy are all influencing the automotive industry’s business decisions. In addition, market entry barriers have been lowered for nontraditional service organizations to enter the mobility market, as the new business model moves from physical objects, like the vehicle and the transportation device, to an information- and service-level-based mobility portfolio.

For existing market players in the hardware or vehicle industry, this means a full transformation of business culture to engage or compete with adjacent service entrants. For market entrants such as insurance companies, mobility service brokers, and fleet or logistics service organizations, this demands customer satisfaction and experience levels with different service-level agreements for reliability, timeliness and cleanliness, as well as for life style factors.

The current technology advances around autonomous driving will open a new dimension of use case scenarios for fleet and driving services. In addition, telematics and in-car navigation systems will provide an interactive data stream that will deliver the fuel for different services and marketplaces.

The information culture, as well as large ecosystems from production to customer and car ownership, will all be disrupted as the utilization of mobility services increases. Software development location and geospatial mapping and the Internet of People will lead to new organizational structures, more focus on service and markets through customer segmentation, and new service ecosystems.

In addition, the thought leaders in this industry vision for mobility must modify the market focus based on the degree of information and contextualized service delivery within the urban management and smart city mobility objectives. Since urban management will follow the requirements of the specific city and industry environment, those alignments mean additional competitive differentiators and could cause disruptions in service delivery for different regions. Business moments such as accident mitigation (see “Business Moment: Two Scenarios of a Car Crash Highlight Digital Business Opportunities”) will develop new dynamic value chains that become service enablers for a new mobility ecosystem.

Driving the Industrie 4.0 Transformation Through — or With — Mobility

The generation of digital value chains in mobility will manifest itself in three different scenarios:

- Transformation within the business domains of the automotive industry leading to mobility as a data platform
Mobility as a Data Platform

In the automotive industry, vehicles have increasingly been equipped with sensors, Internet of Things (IoT) devices and telematics systems to collect information for performance data in the maintenance or repair cycle. This "connected car" data is currently being distributed among automobile companies and their supply chains — as well as with subcomponent manufacturers such as Continental — for their onboard data of systems and parts. In addition, the data is being used for assistance services delivered through the OEM when the vehicle has an emergency, offering remote diagnosis and teleservices such as BMW’s ConnectedDrive, a value-added service focusing on customer assistance. Through the advances in driver-assist systems, sensors in the vehicles also directly communicate with the driver about the surrounding driving environment through examples such as distance control or park assistance.

The analytics of metadata such as driving performance, the distance traveled and remote assessment of the parts provide the foundation for the automobile as a data platform for the OEM, as well as for the entire supply chain. The interaction within the supply chain not only enables suppliers to analyze the conditions of parts linked to the performance statistics of the vehicles, but now also allows data sharing of those affiliations in a data marketplace environment. This data can be shared to shorten innovation and design cycles, as well as to create software for updates and virtual spare parts that can be tested. OEMs can utilize this marketplaces for proactive customer service engagements through a digital garage or dealership model. Because parts have wear and tear based on a variety of factors such as driving behavior, climate zone and city versus cross-country travel, maintenance becomes an interactive relationship with the customer. The service environment transitions from a static relationship to an interactive, contextualized one that could include vehicle uptime as an SLA. For example, vehicles that drive predominantly in mountainous areas could schedule the change to snow tires at the convenience of the customer based on the weather forecast.

Increasingly, customers who are buying vehicles no longer consider the car dealership as their primary source of information. The industrial transformation in car sales is coming from a crowdsourced environment in which cars or drivers gather and present in different social venues. Those venues are contextualized based on the customer’s prime requirements for the car and increasingly include adjacent services such as the ability to transfer mobility requirements like parking, car to bike, convenience in operations or entertainment. Customers will source this data from various places and will make decisions in a more user-specific, and often emotional, context. Therefore, car dealerships need to virtualize information and build experiences that can be linked from dealership to virtual stores and communities via augmented reality.

For logistics and fleet management, remote diagnosis of vehicle uptime can prevent disruptions in the operation of the business. Linking customer operations data to fleet data provides a base for more remote management of customized fleet maintenance, fuel and route efficiency, and even capacity optimization. Embedded sensors engage operators of vehicles with their surroundings.
Mobility and the connected car as a data marketplace have been leading Google and Apple to invest heavily in technology to leverage those data flows efficiently. In April 2016, Apple’s business advances to BMW and Daimler to build the iCar fell through because the ownership of the data generated in the vehicle and with the driver would have been uploaded into the iCloud. Volkswagen, in turn, has been investing with its Digital:Lab in software development with Pivotal, which is designing customer experience services based on mobility data. Ford is also building new mobility applications through its subsidiary Ford Smart Mobility, with a mobility application that is assisting drivers with parking places, car sharing and remote access to vehicle functionality.

Mobility as an Application Platform

In addition to embedded technology, mobility is opening new service environments that can be linked to the hardware but could also remain independent of it. The industry transformation of mobility as an application includes the data available for the assets and the environment in which the assets are moving, as well as customer and market information and context. For the automobile industry, mobility services provide a new service environment and innovation room, as well as a disruption to the existing business. Many car-sharing services such as car2go by Daimler, DriveNow by BMW or Greenwheels by Volkswagen are moving the industry strategy away from owning the asset to building access to mobility into the portfolio. They are competing with car- or ride-sharing companies like flinc. All of these companies offer their customers mobility service with a variety of options for getting places. They manage their assets through the transparency of their service offering, and put more choice in the hands of customers.

In addition, electric mobility provides a new way of connecting the driver through value-added services of the OEM. BMW and partner ChargePoint, for instance, have built ChargeNow, an electric charging network, in which availability of electric charging is embedded in the BMW ConnectedDrive application in the navigation system. BMW is responsible for the payment process as well, offering a ChargeNow card, which works as a credit card for charging services, with different tariffs based on frequency, voltage served and roaming agreements. With Light and Charge, the company will actually move the charging station into streetlights, potentially combining services from intelligent streets, the driver’s context, and vehicle data for new data and mobility services. In comparison, Daimler established its mobility application platform Charge&Pay, which, in addition to identifying public charging station locations and payment includes mobility services such as free Mercedes rental vehicles for a limited time for owners of B-class Electric Vehicles, as well as car2go and other services. Digitalization of a new value stream — from searching for optimized location to demand-based charging availability in order to provide optimized mobility services for the individual — is a disruptive change in the way vehicles and cars have been designed and built as platforms. For the entire automotive sector, this means integrated value chains across organizational boundaries, including new ecosystem partners for transactions and customer experiences.

Mobility as a Service-Level Agreement

Mobility as a service-level agreement is a fully disruptive service program of a vehicle or platform for an OEM, as it guarantees the experience of getting to places at the agreed reliability and experience level, rather than owning the platform. As an Industrie 4.0 value chain, it transforms the physical
process of driving a vehicle into an SLA. For existing automotive OEMs, the market opens up to new competition and service providers through a broad ecosystem or competitive landscape of insurance companies, component manufacturers, public transportation systems, shared and last-mile services, and private companies like Uber, as well as entire support systems such as automobile consortia like AAA and ADAC that provide emergency services and travel support.

The SLA can be through any service provider that maintains trust with the user about understanding the user journey and can orchestrate context-driven mobility requirements into a service environment.

Service levels can be defined by use cases such as commute, recreation, leisure and contextualized ingenuity or by user scenarios such as fitness, doctor’s visit or status pickup. In business scenarios, this could be delivery related by time, value or uptime. These services are transformative for the automotive industry, as the key benchmark is not the automotive platform but availability, reliability, security and the ability to customize the mobility experience for the use case. For many fleets and organizations, mobility as an SLA provides an opportunity to optimize spare capacity in the fleet and transfer excess capacity to a mobility exchange. The impact for logistic providers such as DB Schenker and Kuehne + Nagel or for postal and parcel services such as UPS and FedEx Express can be immense, as spare capacity can be provided on the open market. On the other hand, their competitiveness can be expanded if they become full-service providers by attaching themselves closer to their customers’ mobility or logistics requirements.

SLAs can be developed for alternative modes such as e-bikes, crowdsourced car- and ride-sharing services, as well as new last-mile services like Uber, Lyft or Convoy and context-specific mobility solutions for people with disabilities. In case of an accident, vehicles owners do not need insurance for their car, but now are offered a mobility availability service. This service either detects issues with the vehicle through predictive analytics and ensures a solution is being mapped, or starts to trigger an assessment of the severity of an outage and offers a sequence of resolutions, while continuing to keep the mobility agreement. The assessment will include imminent remedy solutions that may be suggested through crowdsourcing or on-the-spot resolution through additive manufacturing and 3D printing.

All three mobility scenarios have in common disruption that requires a transformation in which existing automotive leaders are assessing their addressable market. Software competencies and more IoT data for new services will not solve the speed to market and customer experience challenges if market agility and changes in customer requirements are not embedded in the business decisions. Industrie 4.0 provides a framework for creating innovative decisions in platform design and ecosystem development.

Appendix

Industrie 4.0: Digitalization of Value Chains

Industrie 4.0 (I.40) is a strategic initiative established by the German government to create and enhance the digital skills and competitiveness of German industry. At its core, Industrie 4.0 describes the convergence of digital technologies with business processes and the respective
alignment with the core competencies of an enterprise. For many enterprises, this convergence represents a digital transformation that will enable and standardize value chains between different enterprise and organizational functions, from innovation to life cycle management within their operations, as well as across the supply chain, sourcing or customer base.

This is executed through a carefully orchestrated virtual or physical digital platform architecture that manages various operational or business processes by enriching those with data and information from the industrial Internet of Things. The platform coordinates the acquisition, management and analysis of data from IT systems and the operational technologies in the organization across different enterprise segments, departments and locations. The internet is used as a communication channel. Figure 2 summarizes the critical technology and business relationship that Industrie 4.0 converges:
A standardized communications, data and analytics framework drives interactions of business processes and value chains in real time to enable decisions impacting adaptive and agile process and business management. In comparison to custom-made and independent systems and processes that will lead to silo efficiencies, Industrie 4.0 offers a framework for standardized data and process sharing across different stakeholders.

Real-time situational awareness is generated through the Internet of Things or cyber-physical systems. It delivers the information and data streams in real time. It is linking the assets (things) or processes in an organization to operations management and its business outcome in automated
manufacturing, supply chain transparency, value-added service development or more customer engagement. Sensors in tools and workbenches allow machine parks to identify microdeviations in real time that could severely impact product quality. On the other hand, tool vendors can identify potential changes in the performance of the tool before the deviation occurs, and provide maintenance to the system before the fault becomes apparent to the customer. This Internet of Services provides small, but tangible, value that organizations, whether they are technology service providers or end users, can scale and build on.

Industrie 4.0 is all about driving value chains through digitalization and creating more agile and market-focused competencies. With the acceleration of business life cycles in global markets and the ability to streamline horizontal enterprise processes such as quality, governance, innovation management and labor productivity, supply chain management will become essential. Digitalization will deliver the speed to interact and collaborate within the organization and also enable new engagement models with external partners and customers, including value-added differentiation. Therefore, Industrie 4.0 will be submerged in the transformation toward new agile and competitive company strategies that are not only based on efficient manufacturing technology, but also combine those functions and silos in the organization with others.

Data and information exchange in Industrie 4.0 is the vital lifeline for new industry business models, as well as for business moments (see "Digital Businesses Will Compete and Seek Opportunity in the Span of a Moment"). The question becomes how this exchange of data across the industry will be facilitated. Too often, available data is being considered as the core competence of the individual enterprise, and disclosure of data, especially within the same industry, could hypothetically threaten the core competitive competencies. Data in itself does not present the value; it will come from applying the right links, algorithms and analytics in the business context that it will be applied to. Therefore the Industrial Dataspace started to develop a framework on data valuation and exchange based on the governance of data ownership. This reference architecture is yet another step in building business models for Industrie 4.0 that leverage data and insights across diversified business models. It will provide more customer and service focus and will empower an understanding of market dynamics that is driving a variety of different ecosystems. It also will be building additional ecosystems through a new way of approaching customers in their existing environments. Organizations that are in the mobility business are examples of this.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"Digital Businesses Will Compete and Seek Opportunity in the Span of a Moment"

"Business Moment: Two Scenarios of a Car Crash Highlight Digital Business Opportunities"

Evidence

1 "BMW, Daimler Reject Cooperation With Apple over 'iCar,'" Handelsblatt, 17 May 2016.

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- Industry Visions for Digital Business Set the Terms of Competition
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