



Driving digital destiny

Digital Reinvention in automotive

Executive Report

Automotive

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Reimagining the enterprise

The global automotive industry is at the vanguard of a digital revolution. Digital technologies are altering how people and businesses interact, creating unprecedented levels of industry dislocation and fundamentally changing business economics. Original equipment manufacturers (OEMs) and suppliers alike are reconceiving driving experiences through a prism of anywhere, anytime mobility. But this is only the beginning. Automotive firms need to rethink their organizations from the ground up. As the birthplace of traditional production chains, the automotive industry is transitioning from a vehicle-centric view to a state of deep, sustained customer centricity. It is doing this through a process we call Digital Reinvention™ – which requires automotive organizations to establish new focus, new expertise and new ways of working.

Everyone-to-everyone economy

The pace of change in automotive is accelerating. Markets have evolved from a state of organizational centricity, in which manufacturers and service providers largely define what types of vehicles to produce and market to customers, into entirely new forms focused on experience. Consumers, clients and colleagues are becoming active participants rather than passive recipients.

A paradigm in which consumers define their identities by the types of cars they drive is rapidly ceding to one in which the underlying objective of vehicle ownership is being questioned. Making mobility choices based on lifestyle preferences is becoming the new norm for today's consumers.

This emerging environment can be defined within what we call the everyone-to-everyone (E2E) economy. The E2E economy has four distinct elements: It is *orchestrated*, based on business ecosystems that are both collaborative and seamless. It is *contextual*, in that customer and partner experiences are calibrated and relevant to their specific actions and needs. It is *symbiotic*, in that everyone and everything, including customers and businesses, are interdependent. And it is *cognitive*, characterized by data-enabled self-supported learning and predictive capabilities (see Figure 1).



73 percent of OEM executives rated mobility services as a significant area for co-creation with consumers¹



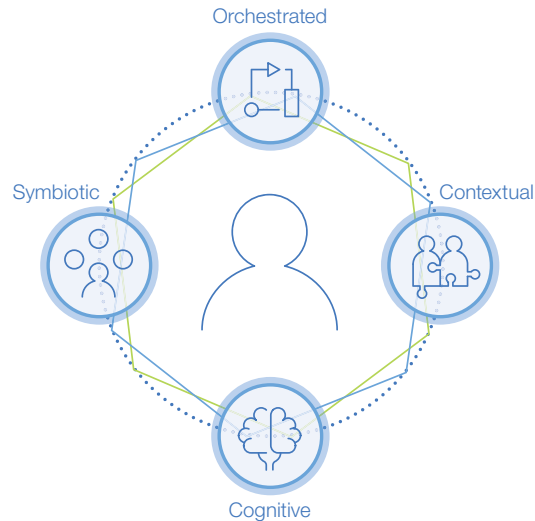
75 percent of automotive industry executives expect non-traditional industry participants to have a key role in the automotive ecosystem by 2025²



73 percent of automotive executives rated collaboration with other industries as the best opportunity for industry growth through 2025³

Figure 1

The everyone-to-everyone economy consists of four elements



Source: IBM Institute for Business Value analysis.

Like other end-consumer-centered sectors, such as retail, consumer electronics and healthcare, the automotive industry finds itself on the frontlines of the E2E transformation. Digital technologies, such as 3D printing, the Internet of Things (IoT), adaptive robotics and cognitive automation, continue to redefine traditional automotive manufacturing processes.

At the same time, on the consumer side, a traditional business model based on vehicle sales is being threatened by one based on personal mobility. As the use of sophisticated market-making ride-sharing technologies grows, many consumers are shifting away from traditional vehicle ownership. For OEMs and automotive suppliers, long-term implications are profound. With fewer people wishing to own cars, demand for cars is set to decline, perhaps precipitously. OEMs that can define new business and operating models founded on new types of automotive economics will be positioned for success. Rather than fight the trend, they can actively encourage, support and enable it.

Technological disruption of automotive

Digital technologies have been redefining manufacturing in the automotive industry since the first robots were introduced on factory floors during the early 1960s.⁴ By the 1980s, sophisticated robotics were pervasive in Japan, the United States, Germany and elsewhere.⁵ Following the expanded globalization of the 1990s, the 2000s saw broad application of internet-based technologies that could provide the infrastructure to support widening and more highly integrated automotive supply chains cutting across countries and continents.⁶ These global manufacturing networks have seen the emergence of new technologies that blur physical and digital worlds and provide increasingly human-like capabilities in and around automated processes.

For example, US-headquartered Local Motors has embraced augmented intelligence with Olli, a self-driving electric vehicle. Using cognitive computing and artificial intelligence (AI) technologies, Olli can help improve the rider experience by supporting seamless interactions between the vehicle and its passengers using natural language.⁷

Automotive companies are also pursuing augmented reality (AR) solutions, as well as 3-D printing technology. Germany's BMW, for example, is researching AR glasses for automotive technicians. With the help of digital elements overlain on physical objects, technicians can look at an engine, identify the parts to be replaced and follow step-by-step instructions on how to remediate and repair.⁸ And Japan's Nissan plans to use 3-D printing to personalize cars by offering a myriad of design and equipment options to customers.⁹

These and other technologies are converging to create four major impacts or disruptions within the global automotive industry. First, as described earlier, traditional customers are beginning to shift away from ownership models and toward mobility expectations across multiple modes of transportation. Second, in the automotive industry and elsewhere, consumers are beginning to expect and demand extreme personalization across any and all types of interactions between consumers, companies, and their products and services.

Third, sometimes referred to as the fourth industrial revolution, Industry 4.0 is driving innovations in digital manufacturing, with increased automation and data exchange helping to improve processes and reveal new opportunities.¹⁰ Automotive companies need to build mobility platforms to support these emerging business opportunities and monetization models. And finally, automotive companies are being compelled to look beyond their own capabilities to build new types of coalitions and partnerships with specialists outside traditional conceptions of the automotive industry. Across industries, loose associations of businesses are coalescing into groupings sometimes referred to as business ecosystems to provide the comprehensive range of capabilities and customer experiences required.¹¹

While all this is happening, industry titans are increasingly threatened by non-traditional entrants that, with the help of innovative new technologies, are actively undermining traditional value chains in search of lucrative profit pools. US-based technology company Nvidia Corporation, for example, is working to launch an almost entirely automated self-driving car by 2020.¹²

Another example is car-sharing company Zipcar, which has created a platform that enables its members to access a variety of vehicles rather than buying one.¹³ And in competition with what can sometimes be expensive maintenance contracts, companies like Aperia Technologies and ClickMechanic are disrupting the industry: US-based Aperia offers self-inflating tires for commercial trucks that pump air whenever pressure drops, while UK-based ClickMechanic offers an online marketplace for car mechanics.¹⁴

It is unsurprising, therefore, that a recent IBM survey of automotive executives from around the world, including OEMs and suppliers, revealed that 73 percent of OEM leaders surveyed rated mobility services as a significant area for co-creation with consumers. Seventy-five percent of all executives surveyed expect non-traditional industry participants to have a key role in the automotive ecosystem by 2025. And 73 percent of all executives surveyed rated collaboration with other industries as the best opportunity for industry growth through 2025.¹⁵

Digital Reinvention in the age of E2E

Successful automotive businesses will embrace new technologies not only to innovate production, but also create the compelling customer experiences necessary to meet the needs and aspirations of emergent mobility-oriented customers. Instead of – or perhaps in addition to – owning a vehicle, consumers will increasingly participate in experiences with specific characteristics, potentially oriented around specific brands. They might opt for a Mercedes experience, for example, or a BMW experience... or a Tesla experience... or a Ford experience. Experience will not be limited to the vehicle, but will extend into other aspects of customers' lives, such as the home or a personal event or holiday.

Because orchestrating deep, holistic customer experiences differs significantly from manufacturing and distributing vehicles, it requires different capabilities. Automotive companies need to rethink how they strategize, organize and go to market. To do so, they need to develop a new focus, new capabilities and expertise, and new ways of working. In short, to prepare for this future, automotive companies need to digitally reinvent their enterprises.

Defining Digital Reinvention

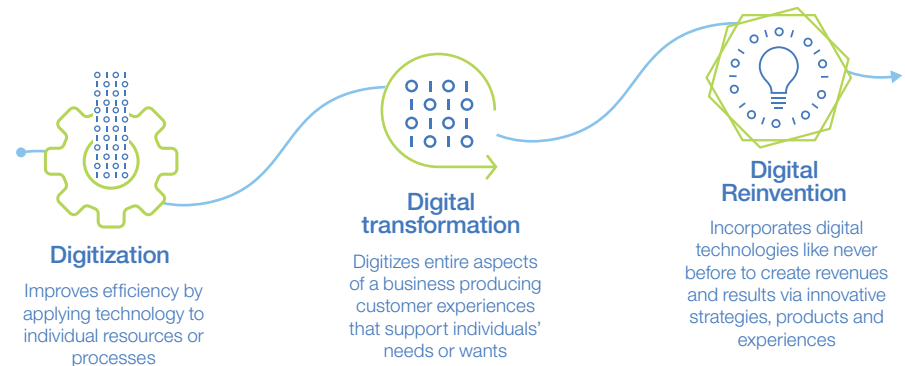
Digital Reinvention combines multiple digital technologies – including cloud, AI, cognitive, mobile and IoT – to reconceive customer and partner engagement models and relationships. Successful digitally reinvented businesses establish platforms of engagement for their customers, acting as enablers, orchestrators and partners, particularly in the automotive industry.¹⁶

Digital Reinvention differs in concept from both digitization of individual capabilities or functions and the process of digitally transforming major business processes or activities (see Figure 2).

Digital Reinvention goes much further than either digitization or digital transformation. It involves fundamentally reimagining the way a business operates and engages with its stakeholders. It relies on a range of digital applications and technologies supporting the construction of deep, collaborative relationships through a fully integrated ecosystem – one in which customers and partners participate at will. Within that context, Digital Reinvention is not fragmented or specific. It requires rethinking how organizations operate and how they engage with partners, customers and the marketplace in general.

Figure 2

Digital Reinvention follows a path that starts with digitization and progresses through digital transformation



Source: IBM Institute for Business Value analysis.

The digital advantage

Digitally conceived organizations are often advantaged in the Digital Reinvention race. Untethered by a legacy organization, they frequently already possess Digital Reinvention attributes. And many digitally born startups are already establishing footholds in traditional markets, putting new competitive pressures on traditional industry leaders. This is certainly the case in and around the automotive industry.

For example, HomeLink is one of the most widely used vehicle-based wireless home control systems. It allows drivers to control a range of home functions, such as opening security gates and garage doors, illuminating exterior and interior lighting, activating appliances, and arming and disarming home security systems.¹⁷ Offering broad interoperability with numerous door and gate systems, as well other radio-frequency controlled devices, HomeLink integrates with a growing list of vehicles and products.¹⁸

Another example is Australian startup Car Next Door, which has created a peer-to-peer car-sharing platform. With a business model similar to Zipcar but based on peer-to-peer foundations, the company connects participating individuals who want to rent a car – on an hourly or daily basis – with car owners who have listed their vehicles.¹⁹ Launched in 2012, the company now has more than 1,000 cars listed and nearly 20,000 borrowers.²⁰

In addition, Ontario-based Sober Steering has developed technology designed to prevent drunk driving.²¹ The Zero Tolerance System (ZTS) uses biosensors in a vehicle's steering wheel to detect a driver's blood alcohol content through tactile hand contact. If a driver is over the legal limit, the ZTS disables the vehicle and, if desired, notifies authorities or other individuals. Unlike standard breathalyzer devices, Sober Steering's sensors monitor blood alcohol content continuously and can be used while a vehicle is actually moving.²²

And Switzerland-based startup WayRay is using AR technology to develop a sophisticated new holographic navigation system for use in cars. WayRay's Navion system projects a holographic digital route onto a car's windshield – enabling the driver to keep his or her eyes on the road. And unlike most AR devices, no additional eyewear or headgear is required to see the image.²³

Readying for reinvention

For successful Digital Reinvention, organizations need to pursue a new strategic focus, build new expertise and establish new ways of working (see Figure 3). In addition, Digital Reinvention requires a focus on cost reduction and efficiency to enable a self-funding approach, as well as a commitment to continually build digital proficiency. As part of this, companies need to leverage the strengths of ecosystem partners.

Pursue a new focus

Automotive businesses need to develop new ways of realizing and monetizing value. As demonstrated by the innovative early movers cited previously, initiatives might include spawning new business models; tapping new forms of financing; and developing better, more holistic ways of conducting risk assessments. Automotive leaders also need to create strategies and execution plans to deliver deep, contextual experiences for end consumers.

Build new expertise

Automotive firms need to digitize products, services and processes that help redefine customer experiences. They need to augment these steps with predictive analytics, AI and cognitive computing, along with IoT and new forms of automation, to create fully integrated, flexible and agile operating environments.

Establish new ways of working

Automotive businesses also need to identify, retain and build the talent necessary to create and sustain a highly digital organization. The most successful will create and perpetuate innovation-infused cultures incorporating design thinking, agile working and fearless experimentation. They also will need to contextualize organizational priorities within business ecosystems, seeking new forms of partnering and new ways to build value within overall systems of engagement.

Figure 3

The Digital Reinvention operating environment revolves around new experiences



Source: IBM Institute for Business Value analysis.

Ford becomes a mobility services provider²⁴

Ford Motor Company is reinventing its business, evolving from a traditional automotive manufacturing company into a mobility services provider. Ford is building new expertise around vehicle connectivity, mobility, autonomous vehicles and big data. The company has formed a global ecosystem of startups and developers to build innovative solutions under its Innovate Mobility Challenge Program. In addition, Ford is reimagining the customer experience through new products such as FordPass, an app that lets users perform a variety of tasks – from remotely starting their cars to finding and paying for parking.

Adopt a self-funding approach

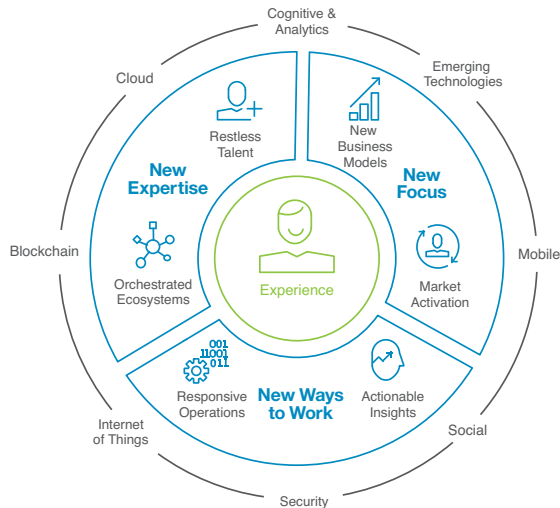
Automotive firms need to deploy new technologies quickly to drive optimization and support scalable growth and market share. They can use digital tools to optimize existing operations and processes, increasing earnings before interest, tax, depreciation and amortization (EBITDA), which in turn can be used to fund further innovation and growth. Some have termed this approach “radical cost reduction and efficiency.” Leaders will pursue a growth agenda of revenue enhancement and new market penetration through product extensions and new market opportunities enabled by digital capabilities.

Embrace digital drivers

Automotive businesses need to become ever-more proficient in digital technologies. In many respects, they will need to become digital leaders. Technologies will inevitably underpin creation of new organizations that can further enhance the deep experiences required. Rather than incrementalism, Digital Reinvention provides a path for visionary firms to adopt an experience-first approach to planning, employing the strengths of ecosystem partners to create truly unique, deeply integrated mobility experiences (see Figure 4).

Figure 4

The Digital Reinvention framework combines the strengths of ecosystem partners



Source: IBM Institute for Business Value analysis.

Daimler reinvents processes – and vehicles²⁵

Daimler is shifting from traditional truck manufacturing to building digitally connected smart commercial vehicles designed to make trucking more efficient and cost effective.

Building new expertise around IoT, AI, cognitive automation, big data, telematics and hybrid systems, Daimler is creating new services and digital solutions. It is also rapidly evolving its manufacturing processes, as it reinvents the end-user experience across the commercial vehicle segment.

Surfing the digital wave

To help guide automotive industry leaders on the path toward Digital Reinvention, we recommend four initial steps: Envision possibilities, create pilots, deepen capabilities and orchestrate environments.

Step 1: Envision possibilities

Conduct envisioning sessions based on design thinking to produce a definitive reinvention blueprint. For example, through deep conversations and in-depth marketing analysis, develop a better understanding of customer needs, aspirations and desires; brainstorm new ideas to enhance engagement; and visualize unexpected customer scenarios. Incorporate external stakeholders in these sessions, including customers, to encourage thinking that goes beyond business-as-usual.

Step 2: Create pilots

Develop prototypes using agile development, test them with customers and get them to market quickly to promote feedback and iteration. Establish communities of interest to create safe environments to beta test innovations, and incorporate them as a central part of design and development processes.

Step 3: Deepen capabilities

Augment digital capabilities with strategic initiatives, and continue to build and deploy necessary applications aligned to the target Digital Reinvention operating model and ecosystem strategy. As pilots evolve, impediments around development will emerge, highlighting limitations in existing capabilities. Adopt a continuous, iterative strategy to address these limitations by building new or extending existing capabilities.

Step 4: Orchestrate ecosystems

Embrace a strategy based on holistic reinvention rather than a series of point solutions, maintaining a clear focus on deep needs, aspirations or desires of customers, clients (such as partners) and colleagues (such as service providers). Focus on ecosystems to expand and align a broader set of capabilities and help create and deliver on customer promises.

Komatsu redefines business processes through IoT²⁶

Japan-headquartered Komatsu is developing a range of state-of-the-art smart construction equipment to better address customer pain points. Combining deep expertise in construction with new digital capabilities, Komatsu has successfully deployed a cloud-based software service, called KomConnect, that connects an array of autonomous robotic devices including bulldozers, excavators and drones. Enabled by advanced digital technologies including AI, Komatsu is able to quickly map worksites in real time, improving precision and accelerating construction.

Related reports

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Key questions

- How can you make your digital strategy more ambitious to face disruption head on?
- In what ways can your organization become more agile so it is better equipped to respond to unexpected challenges and opportunities?
- What steps can you take to make your workforce more open and flexible?
- How can you help your leadership become more visionary, conceiving what customers want before they know it themselves?

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