



# The innovation dilemma of distributed ledger technology

How automakers can break through the legacy barrier and realize the full value of DLT

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# Executive summary

**Interest in distributed ledger technology (DLT) has never been higher. Most people know it from its Blockchain cryptocurrency manifestation, but DLT is much broader—and so are the opportunities for industrial companies. In particular, DLT's transparency and security creates a wealth of new possibilities for automakers and their suppliers.**

The catch? The disruptive nature of DLT creates an innovation dilemma for many automakers. The technology is not well suited to incremental innovation or inward-looking initiatives. Its value comes from an open, outward-looking strategy that emphasizes broad ecosystem collaboration. But automakers' existing systems, processes and organizations typically create a legacy frontier that hinders this kind of approach. And without a clear sense of the potential returns, many have been reluctant to commit to the radical transformation required.

To help the automotive industry clarify the future DLT opportunity, this paper introduces Accenture's DLT Automotive Framework. It's a comprehensive overview of 24 of the most important DLT use cases for automotive, categorized by their applicability to enterprise operations, new products and services, and customer engagement.

Complemented with multiple in-depth expert interviews, we consulted a panel of 53 DLT experts to understand the present maturity level and potential business impact of each of these use cases.

Our findings? Four key insights stood out:

- Mature DLT initiatives today are inward-looking and enterprise-focused, reflecting a lack of industry standards and collaboration to date.
- The real value for automotive lies in emerging vehicle-related DLT use cases, such as V2V and V2X communication, digital vehicle passports, and parts provenance ledgers.
- Electric vehicles represent an ideal greenfield opportunity for exploring DLT use cases like open charging and smart grid.
- Collaboration is the key to unlocking DLT's value, especially in enabling ecosystem plays like shared mobility.

To break past the legacy frontier and open up the opportunities DLT offers, this paper recommends automakers develop a dual strategy towards DLT:

- Drive forward with the identification, prioritization, iteration, and scaling up of key automotive use cases, leveraging start-up flexibility where appropriate.
- Lay a foundation for the future widespread adoption of DLT, including acquiring the right talent, establishing the right organization, and working with emerging industry DLT ecosystems.

By taking action today, automakers can resolve the innovation dilemma that has so far held DLT back in their industry. It won't be easy, of course. But the potential rewards are huge.





# 01

## Distributed ledgers: The next big disruptive technology?

**Surging cryptocurrency prices have once again brought distributed ledger technology (DLT) to public attention. But is this renewed interest anything more than hype? As the technology matures, next-level use cases are now being explored and adopted. And DLT has become a target for venture capital as well as corporate investment, both through a fear of missing out on the “next big thing” and a serious belief in the potential value of the technology.**

In fact, the market is booming. Consider that a third of companies in the consumer goods and manufacturing industries have already implemented Blockchain (perhaps the best-known example of DLT).<sup>1</sup> At the same time, new DLT-focused start-ups have been entering the market to improve the applicability of the technology. Blockchain investment across industries is expected to reach USD 19 billion by 2024.<sup>2</sup> And the global Blockchain market is set to explode, growing from USD 5 billion in 2021 to almost USD 67 billion in 2026 (a compound annual growth rate of 68%).<sup>3</sup>

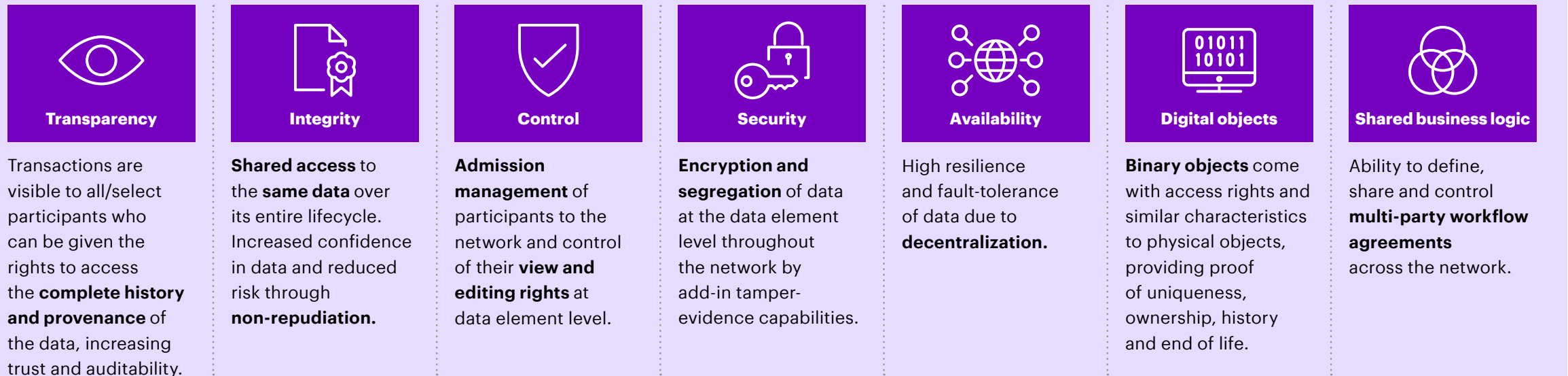
What are the reasons for this burgeoning interest in DLT? Accenture distinguishes seven key features that together characterize the technology and explain its unique benefits (see Figure 1).

Of course, DLT is not a catch-all solution. For many use cases, there will be simpler and more mature technologies that provide faster and more scalable solutions. However, DLT is unique in its ability

to enable decentralized, replicated, shared, and cryptographically secured operations that are validated by mass collaboration. In a distributed ledger, all participants have access to a single central data set, which brings significant efficiency improvements. It also allows for collaborative systems that connect and create value for multiple organizations within an ecosystem through shared data platforms.

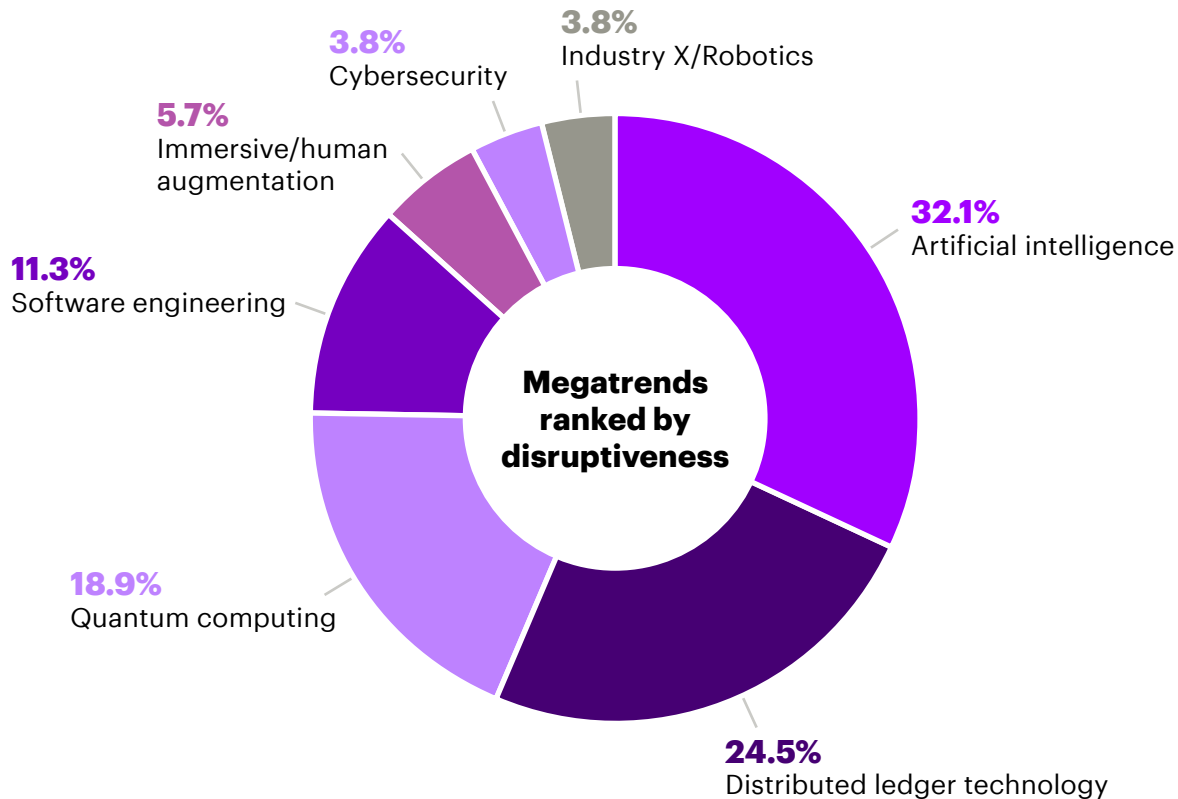
Supply chain tracking is a good example. Traditionally, track and trace is owned by only one player in the value chain and its database is prone to cyber-attacks. DLT, in contrast, allows for greater transparency (“one source of truth”), providing a secure shared record of ownership and location of parts and products in real time. What’s more, due to its audit reliability and open interfaces, DLT enables further automation of services across the value chain.

**Figure 1: Overview of DLT features**



For this reason, 25% of the experts consulted for the purposes of this paper regarded DLT as the most disruptive technological megatrend today, placing it second overall, just behind artificial intelligence (see Figure 2).

**Figure 2:** Most disruptive megatrends (assessed by the Accenture DLT Expert Panel)



**Accenture DLT Expert Panel in cooperation with the Blockchain Research Institute Europe and Blockwall.**

- 53 Blockchain experts with DLT-related industry, technology, investment or consulting professional background.
- Detailed online survey with questions on distributed ledger technology, the status quo in automotive, adoption barriers and future potential, enhanced with the detailed evaluation of specific automotive use cases with regards to their current maturity level and potential business impact.
- Validation and specification of key findings based on 8 selected, in-depth interviews with leading DLT automotive experts.

# DLT automotive experts panel



**Hartmut Müller**  
CTO/VP IT Technology  
Daimler AG



**Sophia Rödiger**  
Founder and CEO  
bloXmove



**Peter Busch**  
Product Owner DLT Mobility  
Bosch



**Harry Behrens**  
Founder and CTO  
bloXmove



**Chris Ballinger**  
CEO  
Mobility Open Blockchain Initiative  
(MOBI)



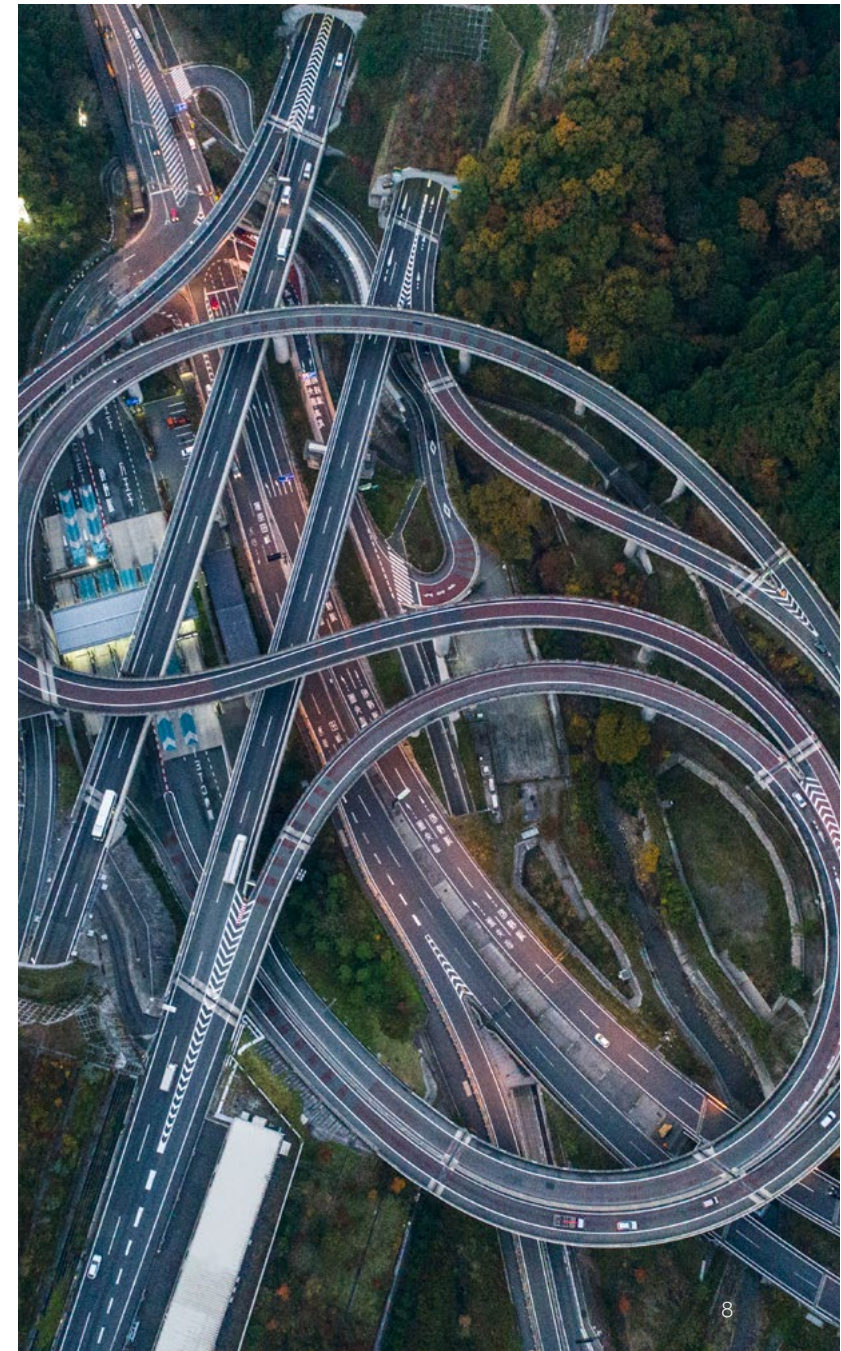
**Dominic Briggs**  
Co-Founder, Blockwall & Blockchain  
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**Prof. Dr. Wolfgang Prinz**  
Vice Chair  
Fraunhofer Institute for Applied  
Information Technology (FIT)



**Richard T. Meszaros**  
Blockchain & Multi-party Systems  
Lead for North America, Accenture





# 02

## DLT and automotive: Natural fit or innovation dilemma?

On the face of it, automotive is a natural fit for DLT. The industry is characterized by the interaction of large numbers of actors across and along the value chain, from customers, dealers, and suppliers to government agencies and cross-industry business partners, as well as automakers and their regional and national sales companies. DLT is well suited to this kind of multi-party collaboration. Indeed, our study shows that 81% of experts emphasize DLT's immediate value-add in revolutionizing how parties collaborate.



“The automotive industry and distributed ledger technology are a perfect fit. It is a highly fragmented environment in which DLT can enable innovative and scalable solutions that foster collaboration across stakeholders to drive new services, consumer experiences and revenue streams.”



**Richard T. Meszaros**

Accenture Blockchain & Multi-party Systems Lead  
North America

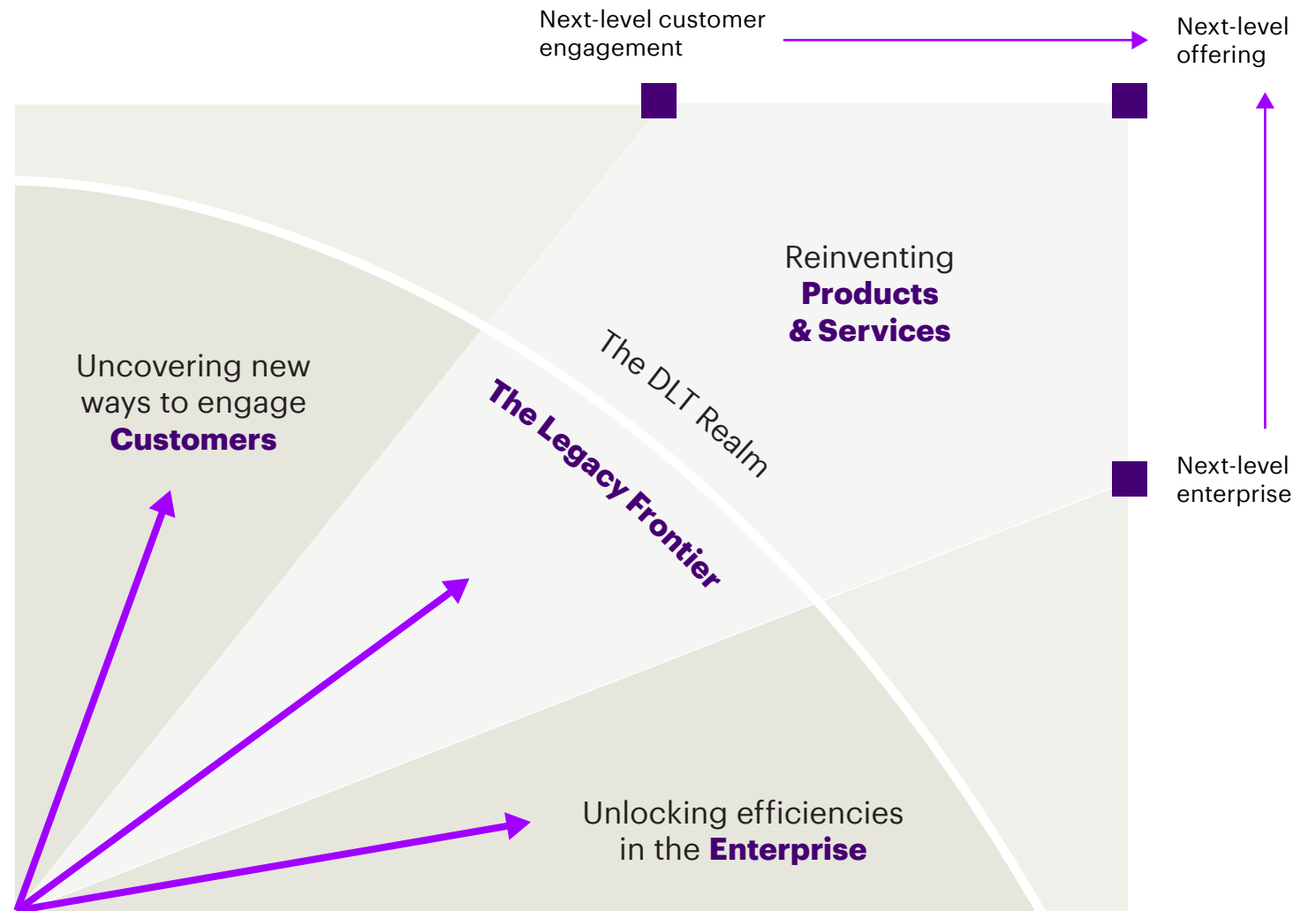
In practice, however, there are hurdles to overcome. First among these is what we call the legacy frontier within automotive manufacturing organizations. This is an invisible barrier comprising the legacy organization, processes and systems that hinder innovation and prevent a business truly transforming its enterprise operations, product and service offerings, and customer engagement (see Figure 3).

This legacy frontier creates a substantial innovation dilemma. It leads manufacturers to focus on incremental innovation within the existing environment at the expense of more radical transformations. But attempting to use DLT selectively to solve narrow problems in this way is fraught with difficulty and likely to fail—something many automakers know all too well from past experience.

**83%**

Of experts consulted for our study regard change resistance and legacy as major barriers to innovation.

**Figure 3: Overcoming the legacy frontier with DLT**



To unlock the full scalability and efficiency potential of DLT, manufacturers need to start with a “clean slate”. That means being willing to cannibalize existing structures and processes to establish new DLT-enabled use cases and business models. The catch? Companies that operate high-performance legacy systems will have little incentive to make the necessary investment in DLT. This is the “DLT Dilemma”.

This is both a business challenge and a mindset challenge. Entering new DLT terrain can be risky and costly for manufacturers. It goes against existing leadership incentives, not least because expected returns will initially be well below current core business revenues. Manufacturers have therefore often taken what they perceive to be the safe option: Evolving the existing systems and structures rather than funding the innovation that might jeopardize them.

This is understandable. Committing to substantial investments in DLT is not an easy undertaking. However, if utilized correctly, DLT can help manufacturers break through the legacy frontier and unlock new possibilities in enterprise operations, product and service innovation, and customer engagement.

“Blockchain, DID (Decentralized Identifiers) and DLT provide solutions which are fundamentally different from existing IT and processes. The lesson learned is to mix these disruptive technologies with legacy systems and especially with legacy business processes. OEMs are best served when they use the technologies outside and separate from their legacy solutions.”



**Harry Behrens**

Founder and CTO of bloXmove



# Consider the following examples:

## Enterprise

As electric vehicle start-ups with leaner operations (including direct sales models) enter the market, incumbent automakers must increase efficiency and reduce costs. They must also adapt to new government policies on carbon emissions and supply chain transparency. By enabling tracking across value chains without intermediaries, DLT can address these challenges while freeing up funds for investment in customer experience and reinventing products and services.

## Products and services

As the industry accelerates its pivot to CASE (connected, autonomous, shared, electric) mobility, the amount of vehicle data generated is exploding. Rather than having to build ever-larger data centers to accommodate this data, DLT enables scalable solutions to monetize it in multi-party systems.

For example, DLT-based sharing services increase transaction transparency and security for all involved parties, and coin-based payment options can further reduce costs for sharing providers. Accordingly, 77% of the DLT experts consulted for our study expect that DLT will have a fairly high or very high impact on unlocking further connected car and shared mobility potential.

## Customer

Accustomed to state-of-the-art engagement and interaction with leading digital brands, consumers have increasingly high expectations for automotive customer experiences. DLT can support entirely new ways of engaging with customers, from the creation of loyalty tokens or tradable coins to the seamless exchange of data in an anonymized and transparent way (such as car usage data).

In short, DLT provides unparalleled opportunities for automakers to reinvent their businesses and their offerings. In fact:

**64%**

Of experts consulted for our study believe that DLT will be a core technology affecting all business areas and functions.

**89%**

Believe the impact of this disruptive technology will enable new channels and business models.

**Moreover, we're not talking about the distant future:**

**81%**

Of experts expect DLT to be a source for competitive advantage in the next five years.

**26%**

Say it will happen in the next one to three years.



# 03

## The Accenture DLT Automotive Framework

**For all the talk about its potential for the automotive industry, the discussion around DLT adoption is still in its early stages. To help move the conversation forward, this paper provides a clear and consistent taxonomy of automotive DLT use cases.**

This Accenture DLT Automotive Framework (see Figure 4 on page 14) is designed to help the automotive industry find a way through the jungle of endless opportunities promised by DLT. It's based on our experience of running DLT projects, as well as in-depth research, and has been validated with both internal and external experts.

In total, our framework identifies 24 DLT use cases within the automotive context. These have been categorized into the three core dimensions of enterprise, products and services, and customer. It should be noted that these use cases do not need to be exclusively enabled by DLT, but are most powerful if they make use of the technology.

**Figure 4: Accenture DLT Automotive Framework\***

Dimension	Use case category	Use case
Enterprise	<b>01 Next-level Enterprise</b> Amplifying efficiency, security and transparency in core activities	<b>1</b> Decentralized Sourcing <b>2</b> Raw Material Origin Tracking <b>3</b> Goods Location & Flow Tracking <b>4</b> Carbon Emission Tracking <b>5</b> Recycling Tracking <b>6</b> Automation of Financial Transaction <b>7</b> Decentral B2B Data Platform
Products & Services	<b>02 Vehicle Sales</b> Redefining convenience and transparency in the sales journey	<b>8</b> Direct Leasing & Financing <b>9</b> Digital Vehicle Passport <b>10</b> Digital Me
	<b>03 Vehicle Usage</b> Providing new opportunities in the mobility ecosystem	<b>11</b> Encrypted Vehicle Access <b>12</b> Open Charging <b>13</b> Smart Grid <b>14</b> In-Car Payment (Wallet) <b>15</b> Usage-based Insurance <b>16</b> V2V Communication (ADAS) <b>17</b> V2X Communication
	<b>04 Vehicle Service</b> Increasing convenience and transparency in the aftermarket	<b>18</b> Parts Provenance Ledger <b>19</b> Warranty Management <b>20</b> Recall Management
Customer	<b>05 Customer Engagement</b> Leveraging new, digital products to strengthen brand loyalty	<b>21</b> Asset Tokenization <b>22</b> Brand Coin <b>23</b> Zero-Party Data <b>24</b> Rewarded Driving

\*For detailed use case descriptions, please refer to the appendix.

# 04 How can automotive unlock DLT's full potential?

To better understand the DLT opportunity in automotive, each of the 24 use cases in our framework was rated on its potential business impact and current maturity level by our DLT expert panel. The “business impact” of a use case refers to either its revenue creation or cost reduction once it reaches full scale. Its “maturity level” refers to the progress of initiatives that can be currently observed in the market.

Discover the four key insights that resulted from this research and in-depth expert interviews:

## Insight #1

Most mature DLT initiatives are enterprise-focused.

## Insight #2

Vehicle use cases are a future value driver.

## Insight #3

E-mobility is an important greenfield opportunity.

## Insight #4

Collaboration is the key that unlocks DLT's value.



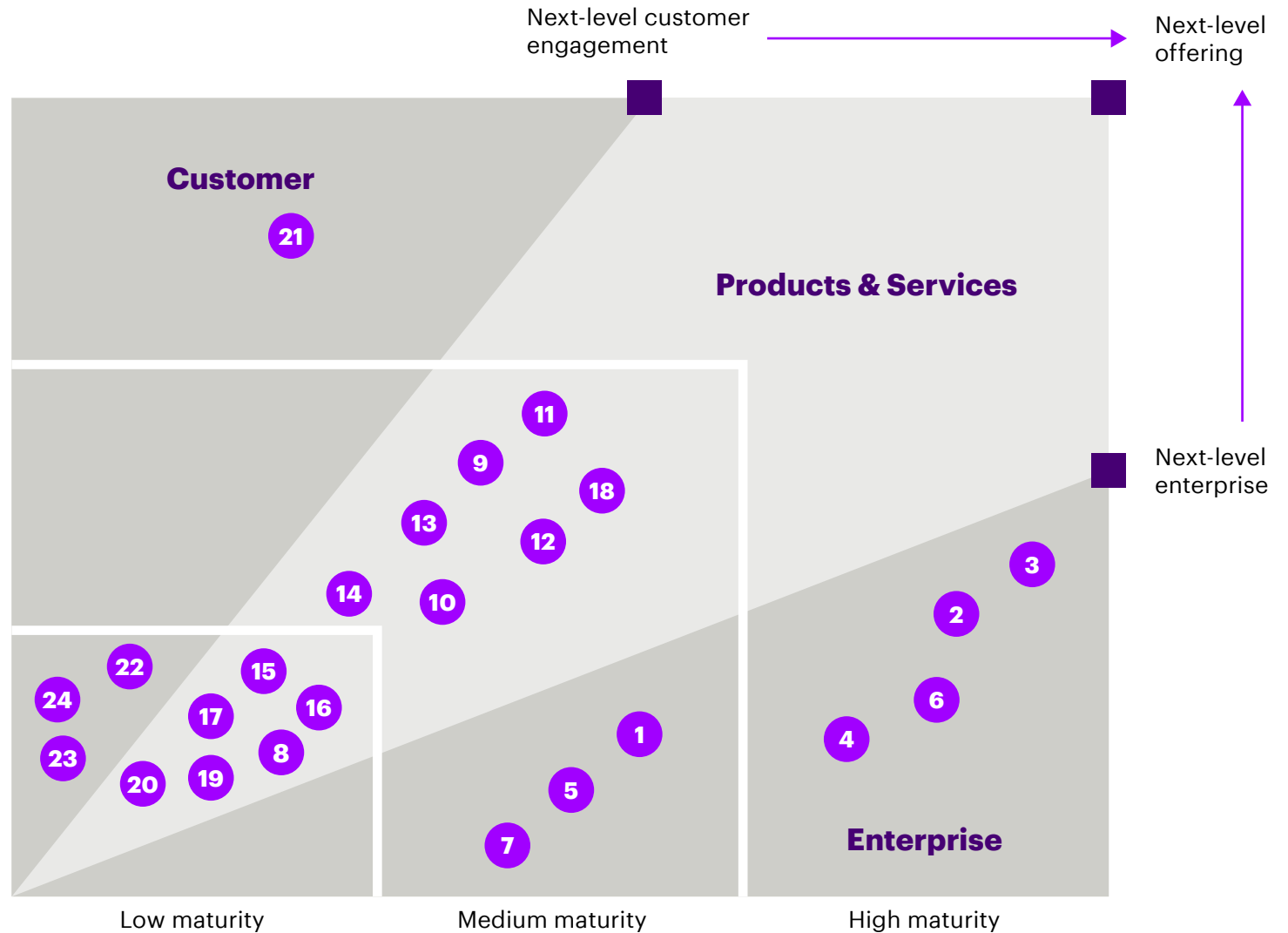
# Insight #1

## Most mature DLT initiatives are enterprise-focused

Automakers are pursuing inward-looking enterprise-related DLT initiatives to optimize internal operations and increase process efficiency. Due to missing industry standards and to minimize risk, DLT initiatives tend to remain internal. This pursuit of “low-hanging fruits” often entails the search for new answers to existing problems.

DLT use cases addressing the efficiency and transparency of enterprise operations are generally more mature than those in other dimensions (see Figure 5). For example, use cases such as raw materials tracking (#2) and carbon emissions tracking (#4) are already being piloted and scaled within the industry, often in collaboration with startups like Xylene.

Figure 5: Maturity<sup>4</sup> per use case across enterprise, products and services, and customer





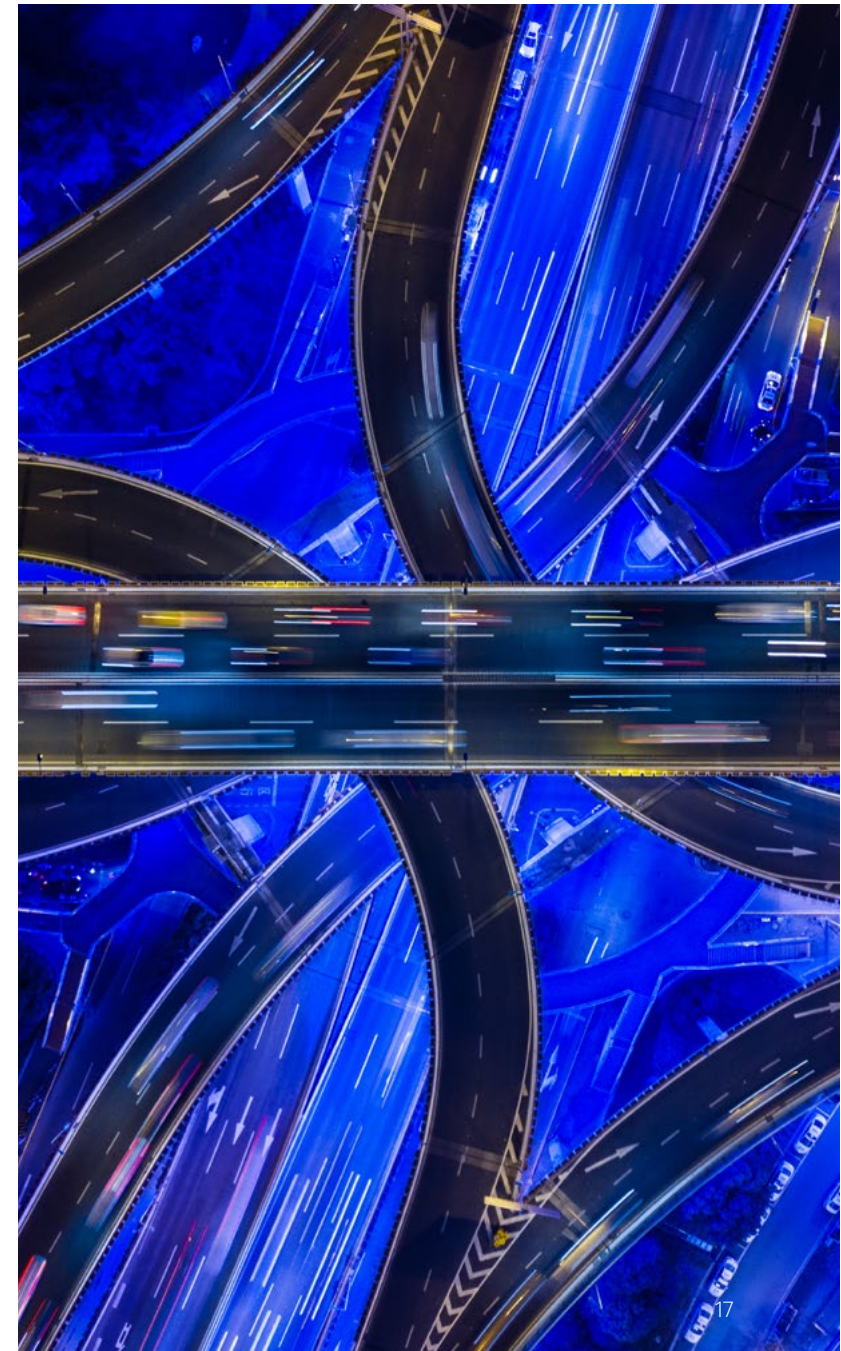
We see two major explanations for this. First, a lack of industry-wide standards has forced automakers to initially focus on enterprise-related use cases, and so they have piloted proofs of concept within their organizational boundaries or within the value chains they dominate. As these use cases mostly relate to internal operations and involve existing (and often long-term) partners, such as suppliers, they are easier to implement, and their value can be better anticipated. They are also lower risk: Failure to implement or scale them will not cause long-term damage to customer relations. Accordingly, risk-averse manufacturers have tended to focus on these “low hanging fruits”.

Second, automakers have historically been efficiency-driven organizations. As they face increasing cost pressure and stricter regulatory requirements, they remain strategically focused on greater efficiency and transparency. And they recognize that DLT can help them unlock new ways to track materials, goods, and emissions across the supply chain. What’s more, because many of the regulatory-related use cases, such as carbon emission tracking, are not yet established at many manufacturers, they can be built with a clean slate—and the DLT Dilemma can be avoided.



### Start-up Radar Highlight: Xylene

Xylene provides producers with an overview of their supply chain, helping them see beyond their direct suppliers, identify risks at an early stage, and prove the origin of raw materials. The start-up enables authentic supply chain transparency for easier fulfilment of compliance and environmental, social, and governance (ESG) targets.



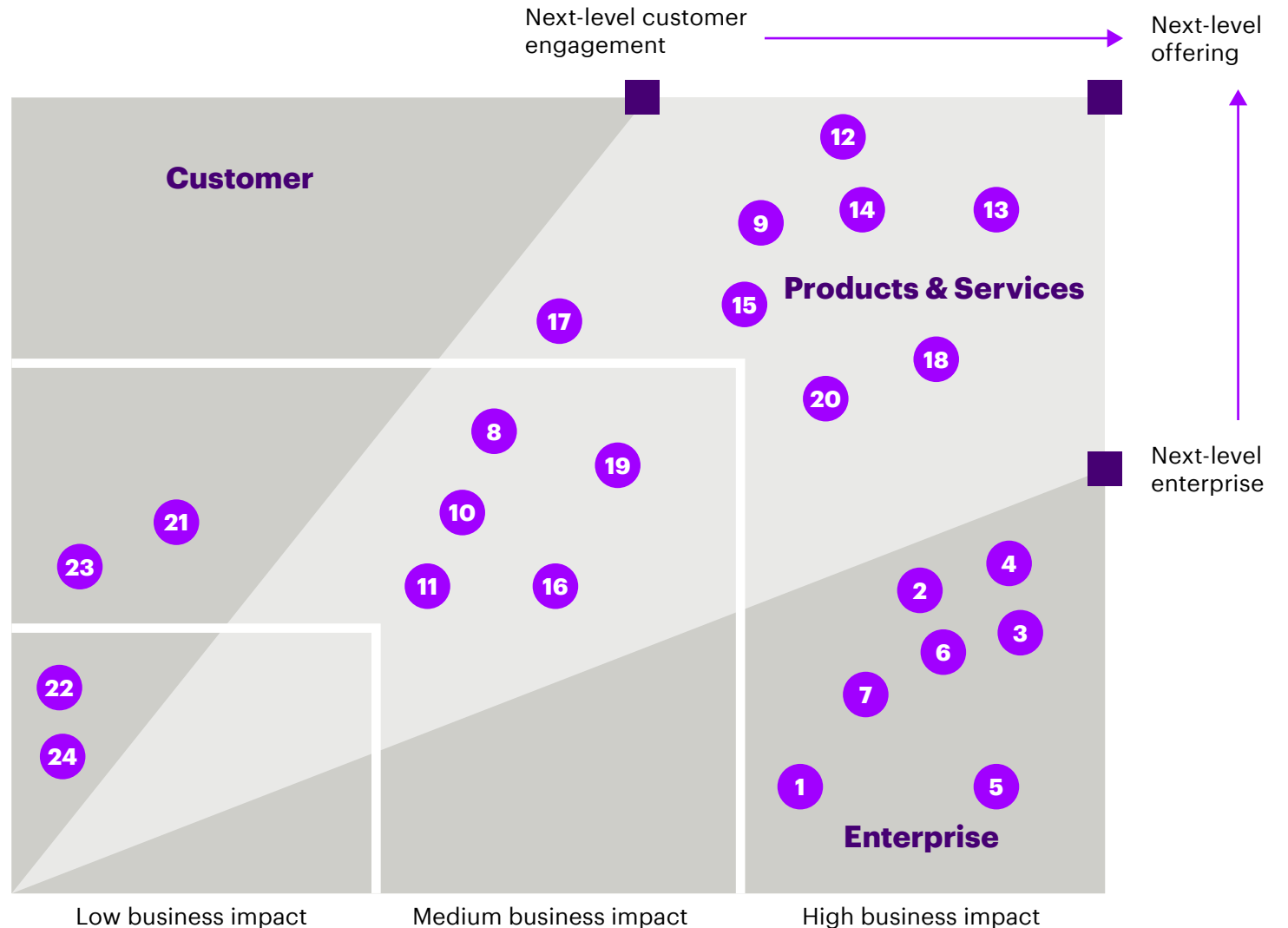
## Insight #2

### Vehicle use cases are a future value driver

Vehicle-related DLT use cases, such as enhanced vehicle features and improved customer products and services, show only low or moderate maturity today. For these, direct monetization potential is either lacking or highly complex right now, and many are instead seen as enablers of future mobility innovation (such as autonomous driving and enhanced shared mobility).

Use cases relating to vehicle sales, vehicle service and vehicle usage are perceived to have higher business impact than maturity. Enhanced vehicle features, such as V2V communication (#16) and V2X communication (#17), and improved customer products and services, such as Digital Vehicle Passport (#9) or Parts Provenance Ledger (#18), show fairly high business impact (see Figure 6) while their maturity is low to medium (see Figure 5 on page 16). The implication? Automakers have realized the potential of these use cases but have been reluctant to put effort into developing and implementing them.

Figure 6: Potential business impact per use case across enterprise, products and services, and customer



Why is this? For a long time automakers had little incentive to invest in any digital vehicle-related products and services because they assumed only limited ownership of the end-to-end vehicle lifecycle. Focusing instead on their core business of manufacturing, selling, servicing and financing vehicles, their investments in digital products and services have been comparatively low and these capabilities therefore lack maturity.

Today's maturity of vehicle-related DLT use cases is also substantially limited by today's legacy frontier. Manufacturers operate within multi-year development cycles, and today's vehicle architectures are not ready for DLT use cases at scale. Regulations also limit the degree to which these architectures can be adapted. Once this readiness is ensured, and the vehicle inhabits a clear digital identity in connected networks, new vehicle-related use cases will be enabled—and these will be a major value driver for manufacturers.

Right now, many of the DLT use cases relating to automotive products and services still lack clear monetization potential. But they are regarded as enablers of future capabilities, such as shared mobility (Encrypted Vehicle Access) and autonomous driving (V2V-Communication and V2X Communication).

In fact, as cars themselves increasingly become commoditized, we predict that vehicle-related DLT use cases will become a key means of capturing long-term competitive advantage and additional revenues. Similarly, with the emergence of direct sales models, raised customer expectations, and the first successful monetization of on-demand or subscription services, manufacturers will increasingly take ownership of the entire vehicle lifecycle. The emphasis will accordingly shift towards digital vehicle offerings.

“The legacy frontier is most evident in today's vehicle architecture. Since OEMs operate in multi-year development cycles, making vehicle architecture DLT-ready remains a major challenge.”



**Hartmut Müller**

CTO and VP IT Technology of Daimler AG

“For OEMs, the open, decentralized concept of distributed ledger might seem to contradict the idea of effectively monetizing products and services. But as soon as we see the first player generating substantial revenues from DLT-based services, this will create an immediate incentive for OEMs to intensify their efforts.”



**Professor Dr. Wolfgang Prinz**

Vice Chair at Fraunhofer Institute for Applied Information Technology (FIT)

## Insight #3

### E-mobility is an important greenfield opportunity

DLT is an enabler of all the CASE (connected, autonomous, shared, electric) vehicle trends. But it's electric mobility where it could play a particularly important role. For example, DLT can enable the collaboration between automakers and infrastructure providers that will be essential in facilitating multi-party transactions for seamless charging use cases, such as Smart Grid and Open Charging.

The novelty of electric mobility is an important factor here. It requires new types of actors, such as energy providers and charging infrastructure providers, to interact through new business models. It is a relatively new field for automakers themselves, who are mostly unencumbered by legacy processes, organizations, and systems—and are thus free of the DLT Dilemma. And it is also strongly influenced by regulatory pressure, especially in areas like charging solutions.

Electric vehicle batteries, for example, are a greenfield opportunity allowing automakers to openly explore new business models and create new ecosystems with new partners. DLT facilitates these multi-party ecosystems by creating trust and enabling automated transactions through smart contracts.

“The increasing decentralization of energy storage and production perfectly harmonizes with the emergence of electric vehicles. Relevant players such as energy providers and OEMs can create new ecosystems from scratch—and they might as well use the best available technology to do so.”



**Chris Ballinger**

CEO of the Mobility Open Blockchain Initiative (MOBI)

# Insight #4

## Collaboration is the key that unlocks DLT's value

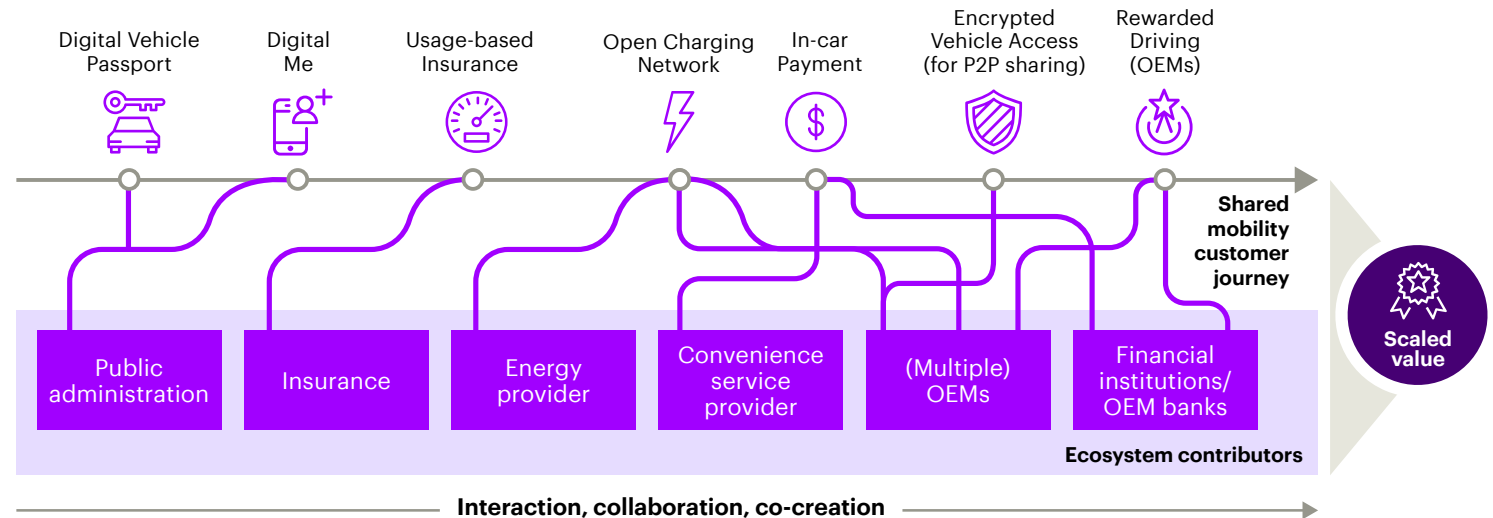
DLT's full business potential will not be unlocked by any one automaker or single use case. The value ultimately lies in combining multiple use cases and bringing multiple parties together in an open network. DLT and multi-party systems are the fuel for transforming today's competitors into tomorrow's strategic partners.

Combining multiple DLT use cases and multiple participants to enable new ways of doing business is known as a "Play". These Plays can be particularly powerful in removing breakpoints in customer journeys and creating truly end-to-end experiences, especially when new and old participants form a tighter network in the ecosystem.

The Shared Mobility Play is a good example (see Figure 7). Multiple DLT use cases are combined across numerous different players, ranging from public administration bodies to mobility providers to financial institutions. For example, the Digital Me use case provides a DLT-based digital representation

of an individual's data, meaning driver's license identification can be automatically shared with mobility providers. An integrated DLT-based wallet allows in-car payments and integrates financial institutions into the ecosystem, allowing customers to conveniently settle payments with any vehicle fleet. And the integration of energy providers in an open charging network increases the availability and accessibility of charging infrastructure. Shared vehicles can be charged at any station and the compensation for the recharge is settled automatically between the energy provider, the mobility provider, and the customer, making new pricing models possible.

Figure 7: Shared Mobility Play



Automakers need to rid themselves of the belief that they should act on DLT use cases alone. Success will not come from single internal initiatives, but from creating entire Play ecosystems. It's not about building a minimum viable product (MVP) but rather a minimum viable ecosystem. Only community-based and collaborative platform approaches will unleash the true potential of DLT.

Opening up systems and interfaces stands in contrast to many automakers' current strategies of producing proprietary offerings (such as their own operating systems). However, high-profile consortia such as MOBI, GAIA-X and Catena-X are driving cross-value chain collaboration to harmonize standards.



### Start-up Radar Highlight: bloXmove

bloXmove, a spin-off from Daimler Mobility AG, provides its Mobility Blockchain Platform, which was incubated and developed within Daimler's Blockchain Factory for three years. It is a Blockchain-based decentralized software platform, built for urban mobility as well as for the convergence of electric mobility and power grid in managing and consuming renewable energy. bloXmove collaborates with mobility partners in Germany, the Netherlands and China (such as Tier, FlixBus, Athlon, Wan Xiang Group, 50Hertz and Energy Web Foundation) and envisions the decentralization of sustainable mobility leading to a new connectivity between industries.

“DLT is not a game for single-players, it's a team sport. To unfold its true potential, it requires players to stop aggregating and to start collaborating. DLT's true value potential is set free only if multiple parties—each with their individual offerings and use cases—join a greater network of trust, held together by shared DLT standards and open protocols.”



**Sophia Rödiger**

Founder and CEO of bloXmove

“Many mobility DLT pilots were completed over the past four years—and, while technically successful, most were commercial flops due to the lack of multi-party collaboration. The most promising development in the last year has been the launch of joint pilots and multi-party projects within the industry using shared DLT standards and infrastructure for business automation.”



**Chris Ballinger**

CEO of the Mobility Open Blockchain Initiative (MOBI)

This is helping all involved develop new vehicle-related use cases with the certainty that they can be scaled in an extensive ecosystem. What's more, moves are now being made to bridge missing standards between multiple players and find new ways of integrating DLT within enterprises. One example are interoperable swarm clouds that are able to connect distributed systems, for instance, to orchestrate deployments for field IoT devices, or to manage containers on cross-company infrastructures.

Decentralized technology and new ecosystems are also fertile ground for industry disruption. And as of now, legacy-handicapped automakers are not always well placed to spearhead DLT innovation. Instead, start-ups or suppliers may be better positioned to establish large-scale platforms and thus enable radical innovation. Indeed, DLT provides new opportunities for automotive suppliers to position themselves as integrators between automakers, platforms, and tech players.



### Start-up Radar Highlight: Staex

Berlin-based Staex provides a standardized and efficient software framework that eases the pain of IT and Blockchain integrations for enterprises while enabling the secure and green infrastructure of the future. Its decentralized platform is used for the management and orchestration of multi-party systems, where a multitude of vendors and edge or cloud instances is involved.

“Due to their positioning in the value chain and their broad understanding of OEMs’ most pressing challenges, Tier 1 suppliers are best positioned to create platform-based DLT offerings.”



**Hartmut Müller**

CTO and VP IT Technology of Daimler AG

“Many OEMs have realized that—instead of creating their own, proprietary solutions—they actively approach suppliers, who are well-positioned to create value through platform models in the automotive industry.”



**Peter Busch**

Product Owner DLT Mobility at Bosch



# 05 Can automakers push past the legacy frontier?

Unlocking the full potential of DLT requires automakers to open up their organizations and break free of their complex legacy structures and systems. This legacy frontier is the source of the DLT Dilemma and is a major barrier to DLT innovation.

To get past it, automakers need to consider establishing dedicated DLT business units or even spin-off businesses. Separating DLT activities from core activities in this way will allow automakers to drive more radical DLT innovation with a clearer focus, undisputed lines of responsibility, and measurable outcomes.



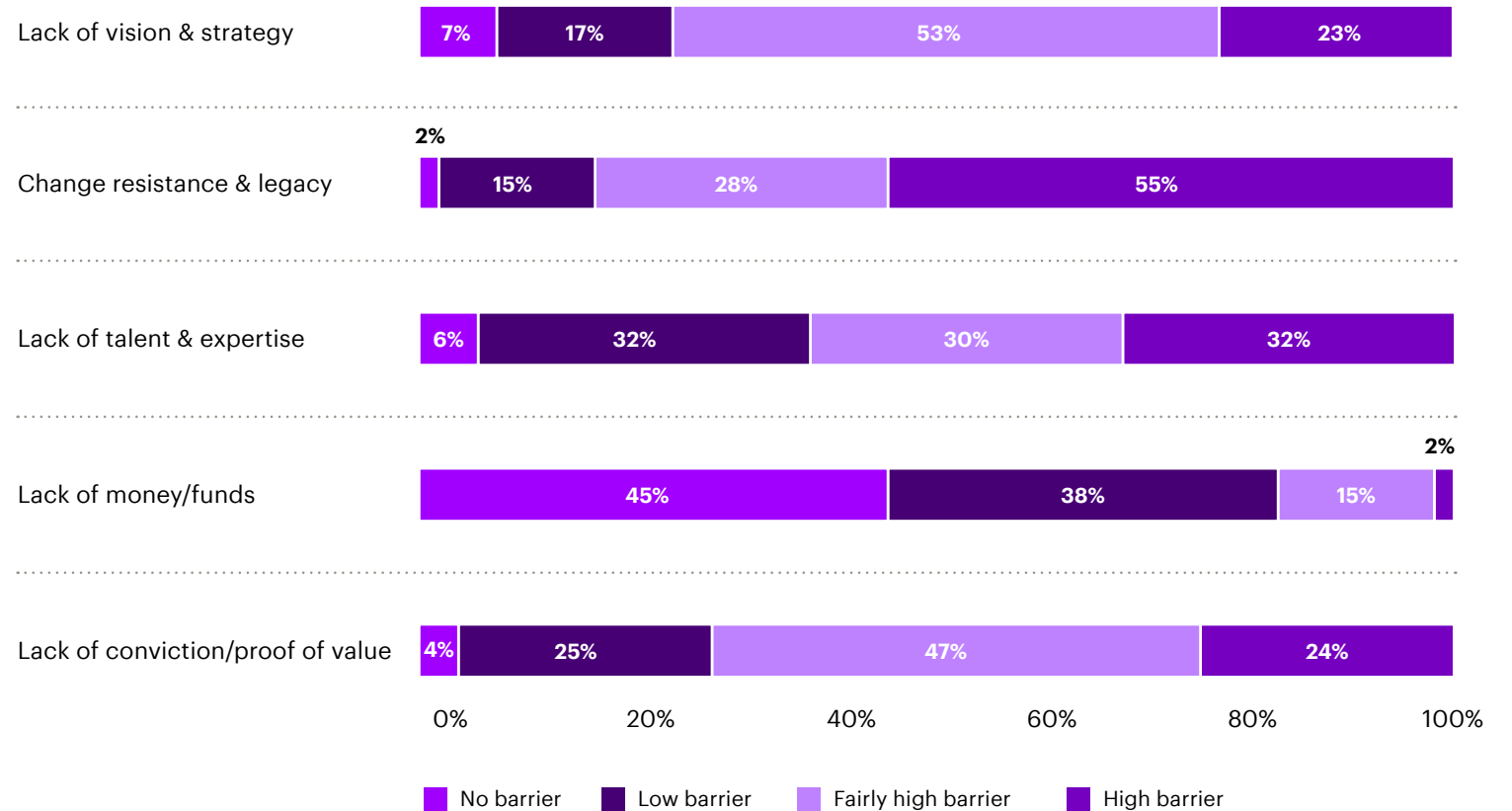
There are also cultural barriers to address (see Figure 8). There is still a notion among automakers that DLT is a technology for the far-distant future which can't yet be applied in the real world. There is also a belief that it lacks benefits compared to conventional technologies, that the use cases are not clear, and that the business impact is unproven.

When comparing first potential DLT revenues with current core business revenues, automakers are reluctant to invest heavily in DLT, or even initiate a spin-off or carve-out.

**72%**

Of experts consulted for our study acknowledge that missing proof of value is a fairly high or high barrier for automakers.

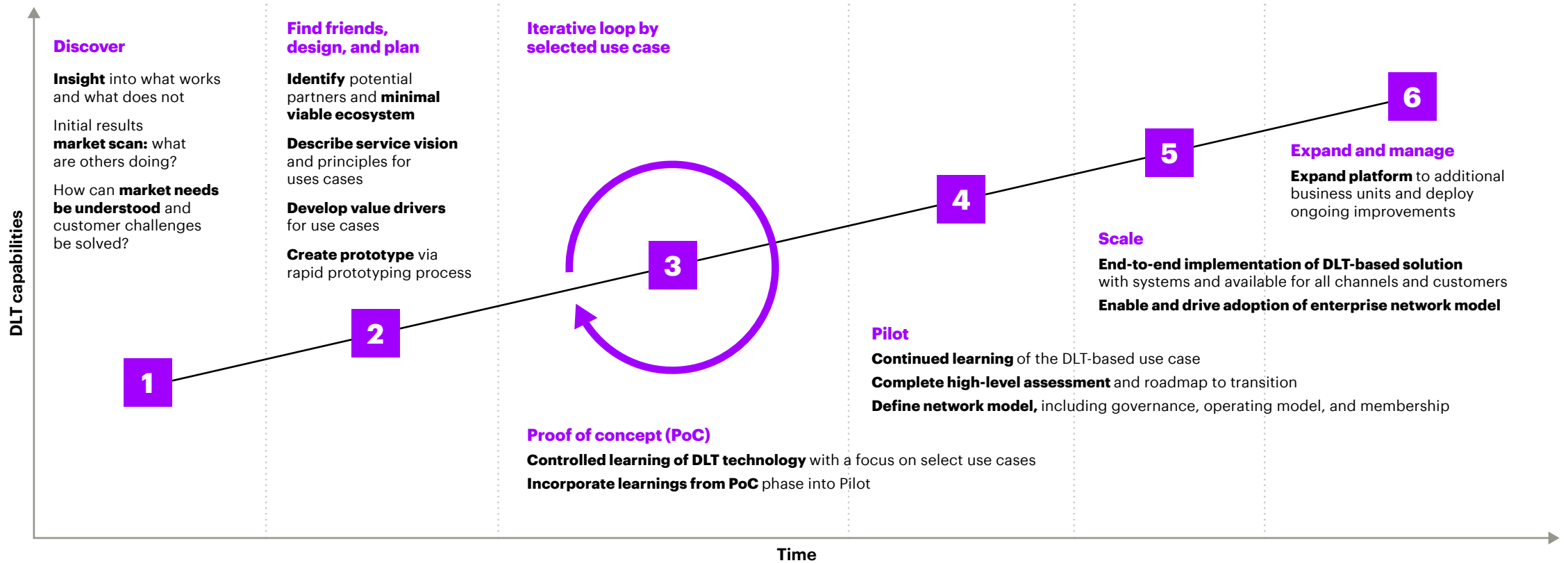
**Figure 8: Automakers' barriers to DLT adoption**



# The solution?

A dual approach to DLT—one that simultaneously goes deep (by iterating and scaling priority use cases) and broad (by establishing the foundation for wider future adoption).

Figure 9: Accenture go-to-market approach



## 1. Identify, prioritize, iterate and scale

To be able to scale up DLT use cases, an organization first needs to understand which to prioritize. One way to do this is to use technology scouting and start-up radars to keep track of current DLT developments and new innovations.

By combining these external insights with internal opportunities, use cases can be ideated, fleshed out and prioritized by business impact and feasibility. The most promising can then be iterated and tested as proofs of concept (in conjunction with specialized start-ups where appropriate) and scaled across the ecosystem.

## 2. Build the foundation for what happens next

At the same time, automakers must look to trigger a mindset shift and ensure the business is ready for broader DLT adoption when the time comes. This can be done either by embedding DLT into the overall IT strategy (recommended by 53% of experts) or by creating a dedicated DLT strategy (recommended by 40%). Either way, the objectives must be clear and measurable to trigger innovation.

Automakers should also think about their organizational setup. This includes attracting the right talent and ensuring the organization has the freedom to rethink entire business models without legacy constraints. An important point: This organizational setup will need to constantly evolve, perhaps by initially establishing a dedicated DLT innovation hub, and then considering a spin-off as the solutions scale up.

Of course, a DLT foundation is about more than any one enterprise. So the next step is to develop a comprehensive DLT network, identifying promising start-ups and joining relevant industry-wide DLT initiatives and ecosystems launched by relevant partners. That might include working with insurers to launch usage-based insurance offers across mobility providers, or with banks to launch an in-car wallet ecosystem. Working collaboratively and pooling resources in this way can also help automakers overcome the challenge of attracting and retaining DLT talent (a significant barrier according to 62% of experts consulted for our study).

“Start-ups are the driving force of DLT innovation. They are liberated of any legacy, purely driven by the objective to create innovation based on distributed ledger technology. They often focus on specialized use cases, but provide state-of-the-art cross-industry platforms that can be leveraged by large-scale enterprises.”



**Dominic Briggs**

Co-Founder of Blockwall and the Blockchain Research Institute Europe

“The reason why established players are increasingly looking to collaborate in ecosystems is the access to talent, e.g. residing in DLT start-ups. Only with sufficient talent, can DLT use cases be successfully scaled within and beyond the organization.”



**Peter Busch**

Product Owner DLT Mobility at Bosch

# 06

## Conclusion:

Look beyond legacy to the DLT future

**DLT is a disruptive force that has huge potential for the automotive industry. Indeed, the technology is arguably an ideal fit for the automotive value chain, which involves multiple interactions between multiple players. But to realize the value on offer, automakers and suppliers must break through the legacy frontiers that currently hinder innovation.**

The goal? To resolve the DLT innovation dilemma and start to openly and collaboratively engage in the emerging DLT ecosystems that will ultimately create value for customers and shareholders. This decentralized future will bring challenges, of course. But the potential rewards are huge. Automakers must take action today.



# Appendix

## Appendix - Use case details (1/2)

Use case	Description	Category	Maturity level	Business impact
<b>1 Decentralized Sourcing</b>	All actors in the supply chain are using smart contracts to exchange and track information along the sourcing process.	Enterprise	Medium	High
<b>2 Raw Material Origin Tracking</b>	All value chain actors can document and track the source and origin of raw materials (e.g., mining precious metals).	Enterprise	High	High
<b>3 Goods Location &amp; Flow Tracking</b>	Automakers can track goods' positions, movements, load status and impacts across the value chain through the combination of a DLT/ Blockchain network and intelligent hardware.	Enterprise	High	High
<b>4 Carbon Emission Tracking</b>	All value chain actors can document and track the emission of carbon in a tamper-proof audit trail along the sourcing, production and delivery lifecycle.	Enterprise	High	High
<b>5 Recycling Tracking</b>	Automakers can track recycling activity across the recycling supply chain to measure circular car objectives along the entire product lifecycle (e.g., re-use specific parts such as batteries).	Enterprise	Medium	High
<b>6 Automation of Financial Transactions</b>	Automated transaction settling between automakers, financial institutes and other ecosystem players using tamper-proof transaction databases and digital signatures.	Enterprise	High	High
<b>7 Decentral B2B Data Platform</b>	Automakers can share their data (e.g., research data, marketing data, production data etc.) within the business ecosystem (e.g., in a zero knowledge proof, manipulation secure manner).	Enterprise	Medium	High
<b>8 Direct Leasing &amp; Financing</b>	Customers can directly finance or lease their vehicle without a banking intermediary.	Products & Services	Low	Medium
<b>9 Digital Vehicle Passport</b>	Customers can track and verify the trusted vehicle history (e.g., mileage, accident history), its ownership and exchange these data with others (e.g., potential buyers).	Products & Services	Medium	High
<b>10 Digital Me</b>	Mobility ecosystem stakeholders can exchange their customers' personal and preference data (e.g., identity, vehicle settings, etc.), creating a digital twin of the customers.	Products & Services	Medium	Medium
<b>11 Encrypted Vehicle Access</b>	Customers can provide other individuals—such as parcel delivery personnel—a virtual key over a pre-set time to access or operate the vehicle based on pre-defined conditions.	Products & Services	Medium	Medium
<b>12 Open Charging Network</b>	EV drivers can access charging stations from different providers through a decentralized network with the settlement of compensations across multiple providers via smart contracts.	Products & Services	Medium	High

## Appendix - Use case details (2/2)

Use case	Description	Category	Maturity level	Business impact
<b>13 Smart Grid</b>	EV drivers can use bi-directional charging to absorb and to supply electric energy into the grid with an automated settling of compensations based on DLT/ Blockchain.	Products & Services	Medium	High
<b>14 In-Car Payment (Wallet)</b>	Customers can link their wallet with the vehicle to enable automated and direct in-car payment as well as in-car commerce (e.g., for parking, toll, fuel, digital services, etc.).	Products & Services	Medium	High
<b>15 Usage-based Insurance</b>	Customers can share their vehicle data (GPS, driving behavior, etc.) with insurance companies to receive dynamic rates based on the customer's driving profile.	Products & Services	Low	High
<b>16 V2V Communication (ADAS)</b>	Communication between vehicles, such as alerts for approaching dangers, potential collision ahead, is secure and decentralized.	Products & Services	Low	Medium
<b>17 V2X Communication</b>	Communication between vehicle and its technical surroundings/infrastructure such as traffic lights, toll stations, etc. is secure and decentralized.	Products & Services	Low	High
<b>18 Parts Provenance Ledger</b>	Automakers, suppliers, dealerships, service providers and customers can directly verify the genuineness of vehicle parts based on unique parts identity on the DLT/ Blockchain ("parts chain").	Products & Services	Medium	High
<b>19 Warranty Management</b>	Warranty claims are automatically checked and settled, and follow-up warranties booked, based on smart contracts.	Products & Services	Low	Medium
<b>20 Recall Management</b>	Automakers can uniquely identify parts built into vehicles based on individual VINs and can recall specific vehicles with defective parts without the need to recall the entire model series.	Products & Services	Low	High
<b>21 Asset Tokenization</b>	Customers can collect or trade unique, non-fungible tokens of selected assets (e.g., special vehicle models).	Customer	High	Medium
<b>22 Brand Coin</b>	Automakers are developing their own crypto currency to reward their customers for loyalty or make it available for trading among themselves.	Customer	Low	Low
<b>23 Zero-Party Data</b>	Customers have data ownership in a secure ledger network and are rewarded with a token-based incentive system for data sharing.	Customer	Low	Medium
<b>24 Rewarded Driving</b>	Automakers can track and reward their customers for certain activities/driving habits (e.g., careful/sustainable driving). Earned tokens can be tallied up to reward the customer with a giveaway.	Customer	Low	Low

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The authors wish to thank Hartmut Müller, Peter Busch, Chris Ballinger, Prof. Dr. Wolfgang Prinz, Sophia Rödiger, Harry Behrens, Richard T. Meszaros, Björn Obermeier, Rajeevan Rajendran, Max Schneider and the entire Blockchain Research Institute Europe & Blockwall Team for their valuable contributions to this study.



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## References

- 1 Statista
- 2 Worldwide Blockchain Spending Guide
- 3 MarketandMarkets
- 4 Experts evaluated each use case's maturity level along the following options: (1) No current initiatives, (2) Initiatives started, (3) First initiatives live and running, (4) Widely adopted

## About Accenture

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