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THE CAPCO INSTITUTE JOURNAL OF FINANCIAL TRANSFORMATION

ORGANIZATION

The car as a point of sale
and the role of automotive
banks in future mobility

ZHE HU | GRIGORY STOLYAROV
LUDOLF VON MALTZAN

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The car as a point of sale and the role of automotive banks in future mobility

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ABSTRACT

The article provides a business perspective on mobility and highlights the interdependence between mobility as a service, connected vehicles, and autonomous driving. We make assumptions on what future mobility use cases might look like and how they would transform the business models of car manufacturers, dealerships, and automotive captive banks. For captive banks, we provide some ideas for staying competitive by adapting new innovative approaches and making better use of customer data, which is undoubtedly their most important asset.

1. INTRODUCTION

Several months into 2018, and the developments in the automotive industry and the broader mobility market are more exciting than ever. Autonomous vehicles are being tested on the streets of cities around the world, from Gothenburg in Sweden to Suzu in Japan. Every major car manufacturing brand is investing in a proprietary connectivity platform to power their own breed of connected cars and, in the process, slowly morphing into an increasingly agile technology company. Ride- and car-sharing demand is reaching new heights – six million regular users according to one recent study.¹ Some of the more progressive municipalities are thinking about the benefits of having an end-to-end digital mobility platform that aggregates all modes of transportation including self-driving robotaxis, ride-sharing, and whatever else is at the core of an urban ecosystem. Electric vehicles are becoming more affordable and far-reaching, with the most recent one being the 2018 Bolt EV by General Motors. The rapid development of mobility economy is taking place along the three vectors – mobility platforms, connected vehicles, and autonomous cars. In this article, we look at each vector and conclude with a section focused on the financial arm of car manufacturers – automotive captive banks – and approaches for them to secure their competitive position amidst the fierce competition from automotive fintech companies.

2. MOBILITY AS A SERVICE (MAAS): OWN YOUR JOURNEY, NOT THE VEHICLE

Disruptive ideas and technologies, combined with economic trends and new consumer demands, are changing the face of mobility. All over Europe, innovative mobility startups and services are being founded, and many technologies as well as services are being tested.² This creates a new range of opportunities for the multiple players in the mobility and transport markets, such as car manufacturers and their captive banks, as mobility increasingly becomes intertwined with consumption. For example, new technologies free up time for drivers as less time behind the wheel implies more time for work, leisure, and infotainment consumption activities. These emerging mobility ideas and technologies can be summed up in one concept – “mobility as a service” (MaaS). Through MaaS, different types of transport methods and services are integrated through a mobility platform that provides mobility services for customers’ needs from a single hub (i.e., website or application).³

MaaS providers offer their customers different mobility services based on advanced technologies and varying transportation parameters, such as shared vehicles (i.e., cars or bicycles), access to public transport, hailing taxis, or car rental services.⁴ Notable examples of ride hailing services are Uber or Lyft.

The main consumer benefit from MaaS lies in the single mobility platform, which facilitates payments via a single payment system in contrast to previous multiple payments and ticketing operations. MaaS offers its users an enhanced value proposition by, for example, simplifying payments for traveling or removing unnecessary organizational aspects of journeys.⁵

The concept of MaaS has, therefore, led to new business models and methods of organizing travel and transport. MaaS provides multi-faceted business models and opportunities for transport providers, including a larger customer base, as more users have access to the service, as well as access to information (data) regarding travel behavior, which in turn can be analyzed to identify unmet demand. A central goal of MaaS is to create a viable alternative to the use of privately owned vehicles without compromising on convenience, sustainability, capacity, costs, and traffic reduction.⁶

Examples of such mobility platforms are the Swedish provider Drive Sweden⁷ and the Finnish provider Whim.⁸ Both offer their customers an end-to-end approach, meaning that travelers can book and pay for a flight, train, or car from one single platform. In contrast to pay-as-you-go services, such as DriveNow⁹ or car2go,¹⁰ these new MaaS concepts allow users to pay a monthly membership fee as well as use the pay-as-you-go alternative. The Whim business model is based on users paying for different monthly mobility plans in return for access to mobility services, such as bicycles or local transport. Moreover, the basic subscription package can be upgraded through additional packages at a higher price, such as a subscription for a car. A central competitive advantage of MaaS platforms is that they

¹ Bert, J., B. Collie, M. Gerrits, and G. Xu, 2016, “What’s ahead for car sharing? The new mobility and its impact on vehicle sales,” Boston Consulting Group

² The Mobility as a Service (MaaS) Alliance, <https://maas-alliance.eu>

³ Definition of MaaS from MaaS website <https://maas-alliance.eu/homepage/what-is-maas/>

⁴ *ibid*

⁵ *ibid*.

⁶ *ibid*.

⁷ What is Drive Sweden, <https://www.drivesweden.net/>

⁸ What is Whim, <https://whimapp.com/>

⁹ What is Drive Now, www.drive-now.com

¹⁰ What is Car2go, www.car2go.com

can use the existing transport infrastructure of other mobility providers, such as train companies, car fleets, and public transport and create a single hub or point of access for customers.

3. MAAS TRENDS AND CHALLENGES

Recent studies have shown that MaaS is subject to several trends, which are likely to change the face of mobility:¹¹

- **New technologies:** Autonomous and connected vehicles will allow for smoother and more efficient driving, which in turn leads to a reduction in fuel consumption (gas versus hybrid versus electric).
- **Emerging services:** New mobility services will be provided in both public and private transport sectors. Urban transport services will increasingly be subject to citywide mobility platforms, which enable users to have access to autonomous public transport, autonomous taxis, and car hailing services. Mobility experts have predicted that digital mobility platforms are going to integrate all transportation methods and services and will become the centerpiece for the approach to tackling the many challenges of urban mobility.
- **Increased safety:** Manufacturers and mobility providers are working to meet the rising consumer demand for more safety in traveling by developing technologies through collected data to prevent and reduce the amount of traffic accidents in both private and public transport. As an example, connected autonomous vehicles may be able to communicate with each other in order to predict dangerous traffic situations.
- **Reduced traffic congestion:** MaaS will help reduce traffic congestion in urban locations, and as a result contribute to an increase in available parking space and a decrease in tailpipe pollution (further decreased by electric or hybrid vehicles)

- **Vehicle sharing:** MaaS services rely on consumers sharing the transportation infrastructure. There will be an increasing shift towards mobility infrastructure owned by MaaS providers. This in turn implies that manufacturers have to reassess who their future customers will be (car and bicycle fleets owned by MaaS provider versus privately owned vehicles).
- **Walking:** As city planning and urban mobility concepts evolve, more consumers will cease to rely on vehicles.
- **Ownership of MaaS:** Private companies will own and provide MaaS platforms, while cities and governments are responsible for providing a legal (e.g., authorizing testing of autonomous vehicles in traffic) and economic (e.g., access to finance/subsidies) environment for them to flourish in.
- **Cities as drivers of MaaS:** Studies have shown that MaaS is not only a theoretical concept. Currently, cities at the core of MaaS have shown that testing of autonomous vehicle models has taken off. Examples include Singapore having AV and taxi trials since 2015; Helsinki testing AV shuttle and bus services; Wuzhen field testing of autonomous cars since 2016; and Suzu testing in public road trials since 2015.

However, the above trends are also facing some resistance:

- **Unwillingness to share:** Many consumers are still unwilling to share vehicles with others. This is due to several reasons, such as: (1) privacy – unwillingness to share a ride with total strangers, (2) habit – consumers are used to owning their vehicle (vehicle ownership is still associated with a sense of freedom, flexibility, and prestige), (3) dependency – unwillingness to be dependent on a MaaS provider or on a public institution, and (4) security – fear of crime and harassment.
- **Public buy-in:** There is still very little information available to urban dwellers about advantages of MaaS.
- **Established mobility providers versus single mobility platform:** These concepts are still being tested and are often only available in certain cities (i.e., pilot projects). This prevents broad consumer adoption.

¹¹ Lang, N., M. Rüßmann, J. Chua, and X. Doubara, 2017, "Making autonomous vehicles a reality, lessons from Boston and beyond," Boston Consulting Group



4. IMPLICATIONS FOR MANUFACTURERS AND CAPTIVE BANKS

Based on the aforementioned trends and challenges brought about by MaaS, we believe that there is a high likelihood that direct sales of vehicles to individual owners will fall. Furthermore, as more people choose walking and shared alternative transportation methods (bicycle or autonomous public vehicles), demand for vehicles will fall even further. However, this is not necessarily bad news for manufacturers and captive banks, as MaaS will provide a range of alternative markets and business opportunities, such as more (autonomous) car fleets owned by governments or private firms. In addition, these organizations will have access to more, and different kinds of, data, which, with improved analytical tools, could create new business opportunities.

5. REAL CONNECTIVITY MEANS NEVER GOING OFFLINE

Together with MaaS, a connected vehicle – one equipped to connect to other vehicles, devices, networks, and services inside and outside of the automobile – offers a glimpse into what mobility could look like in the future. Such changes will result in a fundamental disruption in the automobile industry and challenge our perspectives on what mobility and vehicles actually are.

Having a connected vehicle can significantly improve the traveling experience of passengers, both inside and outside the vehicle. This improvement can be made in terms of vehicle maintenance, time management, safety, and infotainment control.

A connected vehicle would have navigation tools that help the driver choose the most efficient route that minimizes traveling time, fuel consumption, and toll gates payment based on real-time road and weather conditions. It would also be able to collect user field data on vehicle usage and performance and recommend suitable maintenance actions, greatly reducing the instances of unexpected vehicle breakdown and the associated frustration and inconvenience. As such, with better navigation and predictive maintenance functions, drivers would be able to reduce unnecessary time as well as costs associated with vehicle usage.

Real-time emergency calls and pre-collision warnings can also become features of the connected vehicle, significantly improving safety on the road and that of the driver and passengers. Drivers and passengers of such vehicles can also link their mobile phones and other smart devices to the vehicle to listen to news, music, access email, and take phone calls while driving, making traveling more interesting and productive than before. But hold on, this is already reality.

According to Forrester Research,¹² in the future mobility apps will be able to “provide a range of services such as mileage tracking, parking location reminders, diagnostic assistance, crash alerts, and remote control. And some, such as Verizon Hum, provide roadside service and hands-free calling. Tablet-based connected car systems such as Garmin’s DriveAssist, Rand McNally’s OverDryve, and Parrot’s Asteroid line offer a range of features such as navigation, music, voice control, speakerphone, dash cam, backup cam, and driver warnings for collision avoidance or lane departure.”

Beside the added convenience and improved safety for the driver and passengers, there exists a huge potential for the automotive industry and related stakeholders. Everything starts with the automobile manufacturer, who needs to design and build the hardware of the vehicle so it can be equipped with the necessary sensors and software to connect it to other devices. Then, the software engineers can work their magic and turn the vehicle into a “data harvesting machine.”¹³ The data collected when the vehicle is in action can then be mined, used, and monetized by the many stakeholders in this industry.

The “original equipment makers” (OEMs) and dealers can make use of the user field data to monitor the performance of the vehicle and provide diagnostic and preventive maintenance. Such data can be used to make warranties more effective and more tailored to the uses of individual vehicles and customer needs. For example, automatic scheduling of maintenance appointment can be made based on actual vehicle usage. This scheduling can also be linked to the OEMs, helping them with their inventory management and letting them know the type and number of component parts to prepare for a certain customer at a specific time. Information providers, such as radio stations, can provide infotainment and traffic conditions to the vehicle based on the preferences and location of the driver and passengers, collected over time via vehicle usage.

Connected cars also have the potential to disrupt the auto insurance market by providing pay-as-you-drive insurance. This type of insurance can achieve a better segmentation of customers as well as better alignment of insurance and the risks involved.

“According to Forrester Research, in the future mobility apps will be able to provide a range of services such as mileage tracking, parking location reminders, diagnostic assistance, crash alerts, and remote control.”

Retailers can also make use of such data to bring targeted advertising and offerings to the driver and passengers based on their personal preferences and locations straight into the car, and also provide on-demand information about the retail stores in the vicinity.

Last, but by no means least, the data can also be used by roads and traffic authorities, police, and hospitals. Connected vehicles would enable emergency, distressed, and breakdown calls, as well as vehicle data based road maintenance. In addition, better speed monitoring and road toll systems can be set up and traffic flows can be better managed.

Along with a huge potential in this emerging connected vehicle movement come a few risks that cannot be ignored. Certain necessary changes need to be made in order for the connected vehicle ecosystems to function and flourish.

It could be said that the most important issue with the connected vehicle is data protection, since the misuse of such data could cause unimaginable damage to end-users and the society at large. The information security framework, as set by the U.S. National Institute of Standards and Technology (NIST),¹⁴ which covers confidentiality, integrity, and availability of data, is a good starting point to tackle this issue.

¹² Gillett, F. E., 2016, “The retrofit future of the connected car,” Forrester

¹³ Kaminska, I., 2017, “Your car as a data harvesting machine,” Financial Times, November 24, <http://on.ft.com/2FbD0j7>

¹⁴ The National Institute of Standards and Technology (NIST) has core competencies in Measurement science, rigorous traceability, development and use of standards, <https://www.nist.gov/>

The car usage data, as well as the data on drivers and passengers, need to be properly managed. Given its huge commercial potential, it could be hacked, misused, altered without permission, or lost. When such things occur, the safety of the driver and passengers could be compromised, and the owner of the data could face financial, regulatory, and reputational damage. Hence, it is essential that automakers, technology firms, and the government work together to set laws and regulations in place to protect the data that is generated by connected vehicles. They need to agree on what data can be collected and whether consent is needed from the driver and passengers.

How this data is used is also an issue that needs to be considered carefully. For example, if the connected car detects that the driver regularly visits doctors and pharmacies, should this information be given to medical providers in case the driver has an emergency medical situation? Should this information also be given to the car insurance provider who might need to reconsider the insurance plan for the driver if his/her medication or medical condition increases the risks of road accidents? For questions like these, there are no clear answers and it is up to the stakeholders involved to come up with solutions that are balanced, fair, and beneficial.

6. HANDS-FREE BOOSTS PAID-FOR SERVICES

An extension and further evolution of connected cars is the autonomous car: in addition to being connected to other devices, infrastructures, and networks, an autonomous car requires no human driver. Currently, the autonomous car is still in development. Since 2010, technology firms and automakers have invested more than U.S.\$ 111 billion¹⁵ to fund the research and development of both semi-autonomous cars, which operate with driving assistants, and autonomous cars, which operate completely on their own.

On top of the aforementioned market disruptions caused by connected cars, the introduction of autonomous cars will bring about even bigger changes in society, especially in retail, advertising, and traffic management. This is because with assisted driving, or self-driving functions, people would have the capacity to turn their attention to other things than the driving wheel while in the car. This is aptly described by a research done by Gartner Inc.,¹⁶ which compares the automobile evolution to “embracing the automobile as a critical element in users’ digital lifestyles. Connected drivers

are ultimately connected customers and consumers who increasingly have a desire for consuming, creating and sharing digital content in all situations – including when being mobile in an automobile.” The combination of autonomy and connectivity will create a “third space”¹⁷ that is neither home nor work, where people will have the time and opportunity to engage in activities of their choice. This is where retailers and advertisers have the potential to transform an autonomous vehicle into a moving retail store or a digital experience center. Such a vehicle, with digital technologies and attention from passengers, allows businesses to shape passengers’ buying habits much more than what cars can currently do, and will transform the entire mobility concept and experience for passengers. With the self-driving functions, autonomous vehicles can be used as privately-owned cars, or robo-taxis and robo-buses. More people would be using vehicle sharing services and they would no longer need to spend time to look for parking space when they have arrived at their destination, as their cars can simply drive away to find a parking space and come back to fetch the passengers when needed. This greatly reduces road and inner-city congestion and results in more efficient traffic and also cleaner air.

In order for this automobile revolution to happen, an entire ecosystem needs to be set up. All stakeholders must work together for autonomous vehicles to be running at full speed. First, there must be support at the governmental level to ensure necessary regulations and infrastructures are in place. Local authorities, such as road, traffic, and city planning authorities, must collaborate to accommodate the introduction of autonomous vehicles. For example, new traffic rules might need to be drafted. Also, city roads and landscapes would need to be modified to allow for less parking space and more charging points. Governments should also invest in high-speed internet connections to enable better connectivity of the autonomous vehicles to other devices and systems. Further, as noted earlier, governments should create laws that protect privacy of the data generated by the passengers of autonomous cars.

¹⁵ Kässer, M., T. Müller, and A. Tschiesner, 2017, “Analyzing start-up and investment trends in the mobility ecosystem,” McKinsey & Co.

¹⁶ Ramsey, M., and J. F. Hines, 2016, “Master the four stages of connected-vehicle evolution to lead in the renaissance of the automobile,” Gartner

¹⁷ McKinsey, 2016, “Car data: Paving the way to value-creating mobility, perspectives on a new automotive business model,” McKinsey & Company, <http://bit.ly/2F3z0x0>

Second, technology firms and automakers must be willing to invest in the research and testing of the autonomous vehicles features, their safety on the road, and data security in the car. This would be reflected in the number of new patents generated in relation to autonomous vehicles, the number of partnerships technology firms have with automakers, and in the amount of investments injected in developing autonomous vehicle technology.

Finally, it is important to have the acceptance from consumers – the ultimate end-users of autonomous vehicles, whose data can be mined and monetized. Consumers must be willing to, and comfortable with, sharing data about their habits and preferences with entities, such as automakers, technology firms, and possibly retailers and insurance companies. It is only with the buy-in from all three stakeholders that the ecosystem for autonomous vehicles can grow and flourish.

Currently, many countries are partnering with automakers and technology firms to test the feasibility and viability of autonomous cars. Acceptance rate of end-users differs from country to country, although consumers are in general very open to connected cars, which are already in the market, and autonomous car sharing, which is still in development. This is because the cost of transport will be significantly reduced, and the convenience and ease of traveling will be markedly increased with the introduction of autonomous vehicles. The cost of transport is reduced through the elimination of the driver, higher frequency of car sharing, and greater utilization rates of the vehicle.

The added convenience of traveling is a result of the possible “on-demand” vehicle, which eliminates the time to find a parking spot or to wait for public transport or regular taxi. Research has shown that such benefits of autonomous cars are more pronounced in cities where population is dense and aging, and the infrastructure and public transport system are reaching their capacity. Autonomous cars can help relieve the strain felt by the current transport system through providing additional options for traveling. They can also improve safety on the road and convenience for individual passengers, especially if they are elderly or have restrictions with taking public transport.

Not only will autonomous cars benefit individual travelers, they can also make the entire area where they operate better by increasing road safety (which is estimated to result in the elimination of around 3 million accidents a year in the U.S. alone)¹⁸ and lowering pollution.

There is no doubt that autonomous cars will be the future and that future is coming sooner than we think.

7. NEW BUSINESS MODELS FOR NEW MOBILITY

We have so far discussed the established mobility trends and their socioeconomic implications for consumers and the projected impact on the automotive industry and major stakeholders in the public sector. In this section, we will discuss the automotive brands themselves and point out the strengths and weaknesses of their market position and suggest the vector of change.

All players are fully aware that finding solutions for new mobility concepts is not merely a nice-to-have, but essential for survival. The solutions are, however, not possible without rethinking the existing relationship between the manufactures, dealerships, and automotive captive banks.

To start with, it should be recognized that, at least in Europe, consumers still prefer that dealerships configure their car and request a financing offer. However, Elon Musk has shown that this does not have to be the case in the future. Configuring and buying a car online has worked well for Tesla, so why pay dealerships for their dispensable service?

The digital sales channel provides the inquisitive and demanding customer with complete information about the car, as well as the possibility to compare conditions and financing options from many providers, from the comfort of their home. Hence, the only reason to go to a dealership would be the test drive.

Captive banks are very good at providing flexible financing both to dealerships and end-customers. They have promptly responded to the customer demand for “using” instead of “owning” and are important providers of leasing schemes, along with non-captive specialists, such as Santander. However, are captives ready for the paradigm shift in the direction of the connected car and

¹⁸ Collie, B., J. Rose, R. Choraria, and A. K. Wegscheider, 2017, “The reimagined car; shared autonomous and electric,” Boston Consulting Group



the instant payment platform concept, instead of batch processing and T+2 payments status quo? The former is inevitable, when the car ultimately turns into a point of sale, to a smartphone on wheels, where you can buy car apps instead of iOS or Android apps.

We have already mentioned the pay-per-use services that will exist next to pay-as-you-go or pay-how-you-drive services. They require a seamless instant payment infrastructure and activation of the purchased service on-the-fly. The payment infrastructure should be robust to allow for a high volume of micropayments with very low transaction costs. Today, the captives in Europe are not yet capable of performing this task.

Finally, in the future, the connection between the customer and the manufacturer will not break after the purchase of the car is accomplished. The brands that will be successful in becoming digital technology companies will be able to create an ecosystem of connected cars that can be accessed remotely and can exchange data between themselves and the cloud. Data that these cars generate will become the single most important asset for the car manufacturers. Based on this data, customer experience is improved, and hence the better product can, and will be created. The security of autonomous fleets will also depend on the quality of the connected car platform. It can be observed in the market that the manufacturers are the best at coping with platform challenges, whereas captives and dealerships are still some way behind. What steps can captives and dealers take to catch up?

7.1 Buying a car at the bank

Interesting cases of proactive banking were mentioned in the automotive finance study by Nextcontinent.¹⁹ According to the study, a number of French banks have begun selling cars directly to customers. Using their proximity to customers, these banks overtake captives and sign a contract with a customer before they enter the dealership. Similar strategies can be applied by captive banks themselves. Having proximity to both car manufacturers and customers, captives can use their online channel to offer both a car and a financing and insurance package, thus making a visit to the dealership unnecessary.

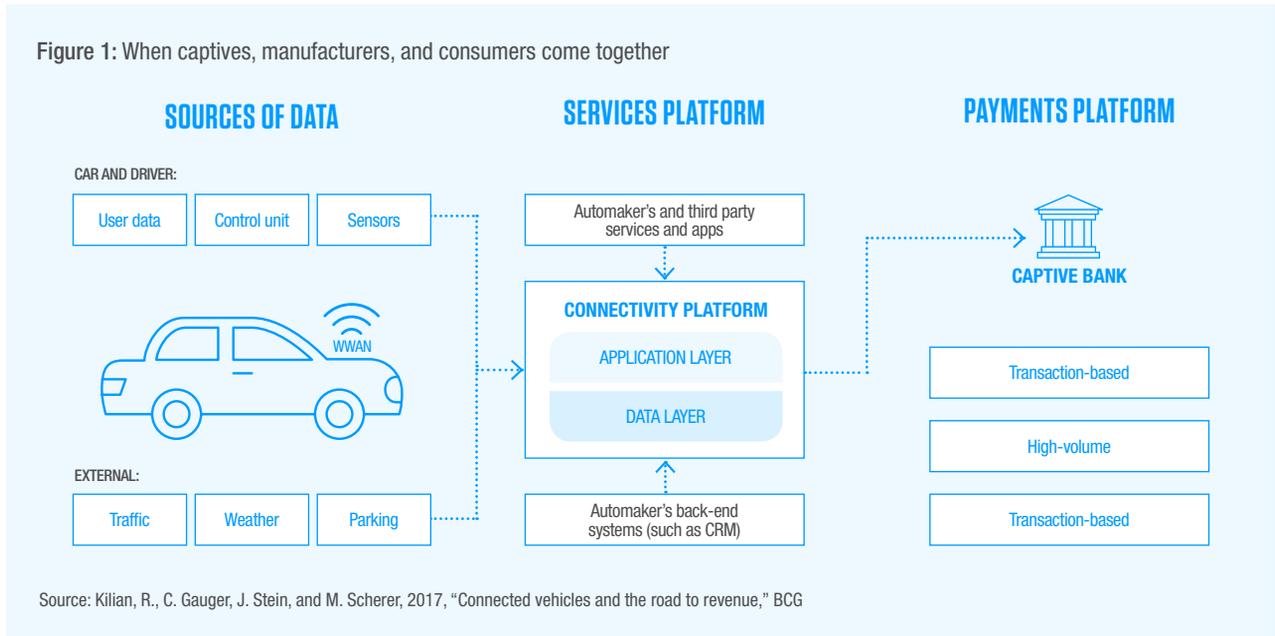
7.2 Product innovations and utilizing the dealerships network

A good example²⁰ of this approach is a German bank that works closely with dealers to capitalize on their customer base. The car price tag at the dealer bears a QR code. Customers can scan the code and be directed to the bank's financing landing page, which is prefilled with the particular car details. Customers can then obtain a complete online credit check by entering their personal and financial details. The client data is then fed back to the dealership, which can follow up with the client on their purchase intention, as can the bank. This example shows how a bank can integrate customers' buy-signals into their digital workflow and simplify the purchase and credit check process for the customer.

¹⁹ Nextcontinent, 2016, "Automotive finance study 2016; the European market and its future challenges," <http://bit.ly/2siGwc7>

²⁰ Ibid.

Figure 1: When captives, manufacturers, and consumers come together



Another approach²¹ from Germany is transmitting customers' personal details to the bank by letting them scan their ID cards using an ID scanning device at the dealership. The data is then stored both with the bank and the dealership.

In the above examples, we can see the smart realization of the credit check process by supporting the customer in their task of obtaining a financing offer and offering them a single point of contact instead of two. In addition, there is always a small percentage of early adopters of new services and devices, who are likely to become curious about innovations by the dealer. They will be the first to test and use the new services and spread the word if they like the experience.

7.3 Knowing your customers' data

As has been shown, customer data is key to boosting revenues. It should be captive banks' top priority to collect, process, and utilize customer data by creating automatic workflows based on recognized behavioral patterns and customer lifecycle events. There are numerous ways in which customer data can be collected and legitimized for corporate use. Data can be gathered both in the pre-sale and in the car-ownership phases. While the pre-sale data mining has been well

exploited in the industry, the car-in-use data collection is a new terrain for most brands, made possible by recent technological advances in automobiles.

Tesla is a well-known player in the data collection game, as it is constantly and relentlessly tracking the usage patterns of drivers of its growing fleet and offering them regular OS updates in exchange for this, making the driving experience better as a result. Some of the more advanced car rental firms are also starting to use the location and fuel status data. By using WWAN (wireless wide area network), Bluetooth, and other protocols, these companies are able to access car data remotely and analyze them in real time. However, client personal data underlies a stricter regulation and cannot currently be used for modeling purposes.

It would be another natural step for captives to work more closely with their car manufactures to utilize the full scale of car usage data regarding specific customers. This data would include car status, personal, and financial customer data. Customers will allow access to the full set of data, if they receive a new level of customer service, infotainment, and security in exchange. Collection of this data is an inevitable milestone on the way to realization of a customer-manufacturer-bank platform. Figure 1 illustrates what that end-game scenario could look like.

²¹ Ibid.

7.4 Investing in digital services

In the past, captives have done well in supporting car manufacturers. They enhanced the value chain and offered innovative financing solutions. But today, captives need to move away from reactive, product-centric operating models, and consider offering a customer-centric portfolio of digital mobility solutions tailored to the fast-changing needs of car buyers.²²

Today, over 46% of vehicles in Germany are financed through captives, which leaves them with an incredible amount of customer data. Car manufacturers and dealers have little access to this data. However, it must be said that captives themselves make little use of the precious asset they possess. Innovation rate has been traditionally low with captives and soon the growing tech-savvy competition will threaten their positions, especially in the wake of PSD2.

However, if captive banks are up for the fight, the right direction would be the creation of a holistic portfolio of digital products, centered around customer needs. Besides the classic financing and leasing options, mobility solutions related to, for example, car sharing, car hailing services, or autonomous driving will help them stay competitive. A car with enabled connectivity can and should receive a unique digital identifier, with which the active elements of infrastructure can instantly identify it. By virtue of this ID, the customer will no longer need to leave a car to pay for fuel or parking. The car number plate coupled with the wireless ID information is enough to lead to the digital wallet connected to the customer's bank account. Captive banks need to recognize this tendency early and make mobility related infrastructure solutions part of their digital services portfolio. Automotive companies have to transform into mobility solution providers – and their captives are best equipped to deliver these products to their customers.²³

8. OUTLOOK

In the middle- to long-run, connected cars will be as widely used as smartphones. We will see the establishment of several competing ecosystems that will further drive the evolution of car-based applications and services. It will not be surprising to see more successful connectivity platforms being based on an open source code – a strategy proven in many other industries. Autonomous cars will soon appear on the streets of most major cities. It is not clear yet how consumers will use them – be they privately owned or shared vehicles, private robo-taxis, or municipal robo-buses. What is clear, however, is that connected autonomous fleets will grow and benefit many stakeholders – from delivery services to logistics companies, from small communities to megapolises. The new lucrative market for car applications, with and without interaction with other infrastructure elements, will soon be filled by all kinds of fintechs, developers, and enthusiasts that will deliver services that we cannot even imagine today. By that time, instant payment platforms will have long become a reality, but it cannot yet be said who will take the lead – fintechs, captives, or non-captive banks.

²² Coccorullo, S., 2016, "Unlocking the hidden potential of automotive captive banks," Oliver Wyman
²³ *ibid.*

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