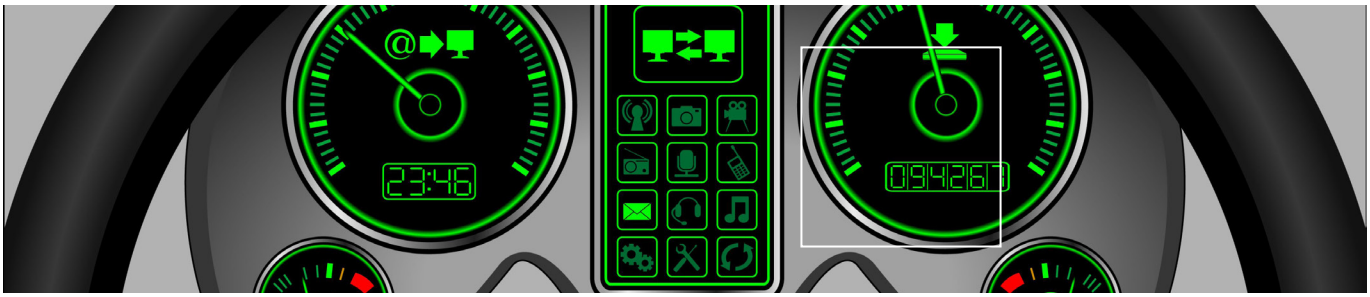
Arthur D Little

Automotive Viewpoint

The Connected Car – Finally Coming True?

How OEMs Overcome Startup Hurdles and Achieve Competitive Advantage



The vision of the "connected car" or more general "connected vehicle" has been around for some time without significant impact in the industry. Today however, the mobile internet is growing in importance and the topic is back on the agenda of the OEMs – but despite a more standardized and capable infrastructure, the key questions remain the same: What are the most relevant services for customers, OEMs, and other service providers such as banks and insurance companies? How to position and manage this complex ecosystem? And finally: How to generate revenues through "connected vehicle" services?

1. Megatrends drive the connected vehicle

The car industry is facing significant changes: Besides the heavy competition and market saturation, e-Mobility and efficient use of natural resources are becoming ever more important and define the image of OEMs. These developments require new tools and technologies in order to work out. In addition, security-driven requirements (e.g. the ability to have a crash notification send to the police; e-Call) will be required by national legislation within the next few years, requiring connectivity in case of emergency.

Ultimately, the growing penetration of smartphones has educated the consumer to access information on demand wherever he is – the car is just another logical place where this information is created, used and stored (e.g. traffic congestion forecast, e-Mail checking etc.).

So, OEMs find themselves in a real dilemma. On the one hand there is a need for action to fulfill the requirements of the ecosystem on connected vehicles – on the other hand, still, there are no existing market models that have been successfully applied – be it with respect to customer acceptance, sustainability or willingness to pay.

2. Key questions for OEMs

OEMs have to answer a set of key questions to successfully realize the connected vehicle.

1. What are the most important use cases for the various user groups (e.g. driver and co-driver as private consumers as well as commercial fleet managers)?

The amount of use cases within the connected vehicle environment is manifold – ranging from services for the private and business car owners to fleet managers, insurance companies and the OEM's after service. Therefore, it is essential that OEMs understand which services are relevant to which group and develop an adequate portfolio of services that build on a common infrastructure and can be seamlessly integrated into the according ecosystem requirements (see Figure 1).

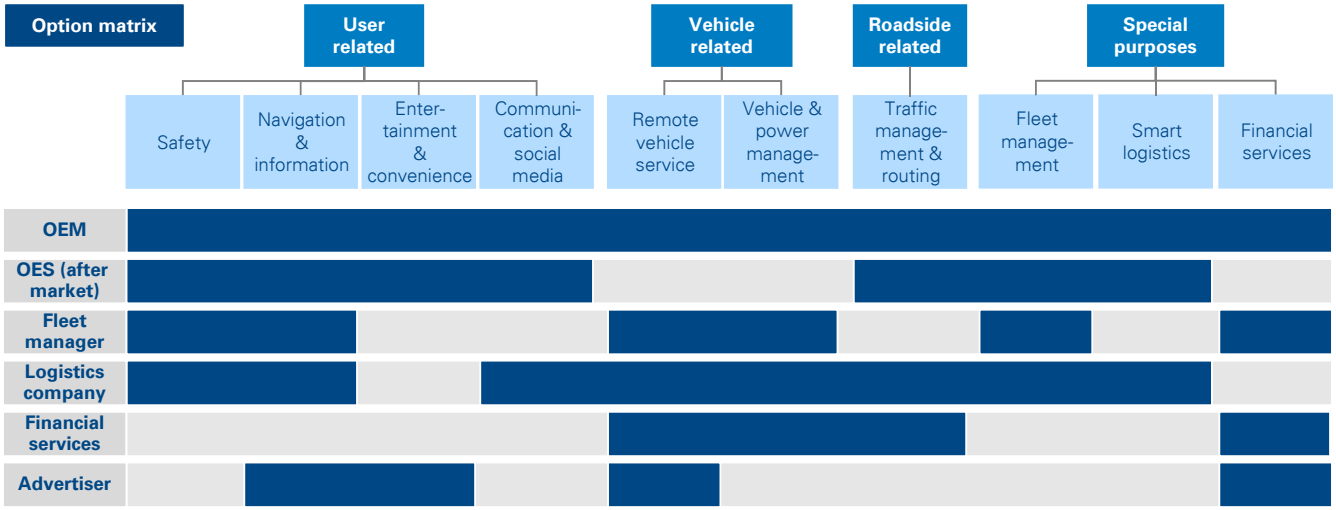
As an example, multi-modal mobility and integrated transportation concepts are currently spreading with the development of smart cities. Functions such as location based traffic and weather information as well as remote lock/unlock concepts are essential for future mobility providers and their users.

The secure provisioning of personal data, information, and documents within the car will also become a key area of interest, since OEMs are best positioned to allow a seamless integration of PIM services (e.g. e-mail, contacts, etc.) into the car without distracting the driver – which is a key problem of using smartphones in the car.

Asset security is also becoming a growing use case in the connected vehicle business – e.g. in Brazil, where every new car needs to be traceable. We therefore expect that insurance companies will gain a significant share in the market – benefitting from less stolen vehicles and also enabling "pay as you drive" tariff structures.

The commercial fleet management (both for light commercial & heavy commercial vehicles) is as of today already the largest segment within the "Internet of Things" – however, we expect

Figure 1: Service portfolio and stakeholders



the service portfolio to increase significantly, bringing together the "fleet" and the "freight" management and therefore enable end-to-end logistics & environmental tracking & supply chain planning, which is required to successfully compete in a low margin business such as transportation.

2. What is the technical infrastructure?

The technical infrastructure must obviously comply with the relevant use cases. As such, the hardware within the car usually requires connectivity to the car's network (CAN BUS, MOST, etc.) in order to allow interaction. The integration of such hardware is also depending on the use cases – e.g. stolen vehicle tracking requires hardware that is not easily accessible and sends out alarms when removed or broken.

The price of the hardware was always a "knock out" criterion for most OEMs in the past – this however has changed within the last years as prices went down significantly due to competitive pressure. Today, e.g. an OCU (On-Board Communication Unit) is much less expensive than it used to be a few years ago.

In addition to the OCU, the market is engaging in "smartphone integration" as a substitute for expensive build-in solutions. Numerous OEMs have quite successfully launched these services which are comparably cheap to buy and limit the complexity for the OEMs as they do not have to deal with OCUs and SIM cards for the connectivity. However, we believe that the future of "Connected Cars" will require both worlds – OCUs and smartphones in a combined interface – but physically separated – since OEMs will likely never deploy vehicle related services on an "unmanaged" environment such as a smartphone. In addition, critical remote services (e.g. tracking & tracing, remote shut-down, etc.) will only work with an embedded system since the smartphone usually does not stay in the car and therefore cannot serve as a connectivity device. Allowing the more entertainment driven smartphone ecosystem to co-exist in a secured environment of services within the car ultimately is a huge complexity to overcome, but technically feasible.

The separation of services between smartphones & OCUs will also result in less complexity with respect to connectivity provisioning – customers therefore do not need to sign a new contract from a connectivity provider (for their entertainment oriented usage), while the OCU (and the embedded SIM card) remains with the OEM and can be billed upfront.

Depending on the chosen strategy, OEMs need to tackle the significant complexity of providing connected vehicle services to multiple ecosystem players. Which sounds like a "sweet spot" within the ecosystem however also requires significant organizational changes, since OEMs are classically selling products rather than services.

3. What are the organizational implications?

The implementation of the connected vehicle vision has to be internalized in the OEM's organization and aligned according to a long-term strategy. Here, a special challenge is the close collaboration of departments which have been largely independent from one another in the past. Cooperation of the vehicle development department with the CIO's IT department is crucial to create the framework to implement connected vehicle services. Competencies regarding in-vehicle IT (e.g. embedded, local integration as well as hardware and software integration on-board) are bundled with competencies regarding the process IT (e.g. centrally hosted IT systems with high scalability and SLA-driven operations). Also the integration of the relevant functional departments such as marketing and sales, after sales, or financial services has to be institutionalized to be successful in the long-term. The collaboration can be settled via boards and loosely linked processes or rather tight by creating an entire new unit.

As the above mentioned requirements are quite complex, numerous 3rd party players are currently positioning themselves along the connected vehicle value chain. Depending on the OEM's strategic goals these players can become competitors or partners to the OEM. Some players such as telematics service

providers (TSPs) can cover all stages of the value chain, others such as content or connectivity providers focus on selected services.

OEMs have to decide to which degree to delegate conception, implementation, and operations of services and connectivity solutions. Taking over the technical realization and operations will depend on the OEM's strategic goals. Utilizing direct customer relations and having access to both customer data and vehicle data will be a major success and revenue factor in the future. Hence, premium OEMs will position themselves as interface and as brand to the clients and will not convey this USP to a 3rd party. In low price segments however it could be preferable to use the strong brand of an OES and take their ready-made platform.

3. Funding of the investments by the OEMs

Historically, connected vehicle services driven by OEMs have not been enormously successful. This is mostly due to the fact that OEMs very often only target the security aspect (e-call, crash notification, etc.) and are rather incident driven. The lack of a daily user-experience diminished the value for the customer and hence led to low uptakes and even lower retention rates after the "free trial" period.

We believe however, that with more sophisticated and "integrated" solutions, the service spectrum will eventually lead to a significant market share and customer acceptance. OEMs in particular can benefit from these solutions in three dimensions (see Figure 2):

A) Prevention of revenue loss

Connected head units will more and more become an integral part of the vehicle equipment, both from the demand and the supply side. Hence, OEMs can invest in connected vehicle services and avoid revenue loss by continuing to sell the highly priced head units. If the OEMs do not act, the classic, monolith systems will disappear, as today users already partially have more functions in their smartphones than in a classical head unit. Therefore, an avoided revenue loss may be seen as a substantive "source of revenue" and serve as a valid justification to critical stakeholders.

B) Optimization of existing sources of revenue

Tele-diagnosis solutions account for a high revenue potential by optimizing existing earning sources which OEMs can benefit from, e.g. in after sales. Customers can be addressed via telematics solutions not only for upcoming maintenance, break-downs or accidents – but also for direct customer related marketing activities. This can help to increase the retention of customers who have already reached the end of their warranty period.

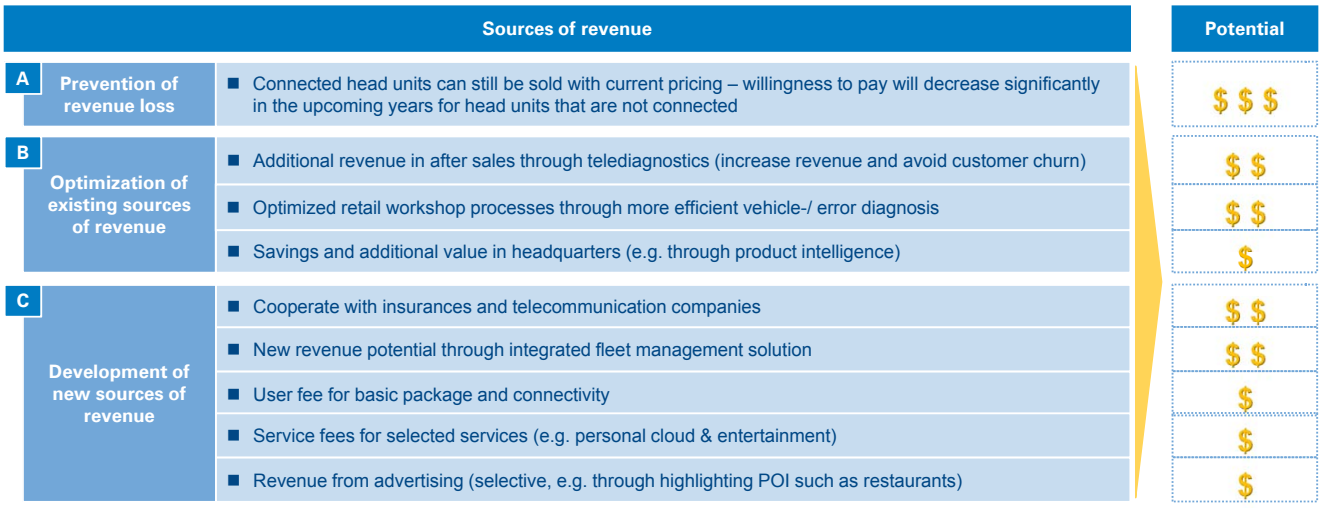
Additionally, connected vehicle services can optimize processes in authorized repair shops and the OEM's subsidiaries, particularly within vehicle and error diagnosis. Significant time savings can be achieved which in turn can be invested in intensifying the customer relationship, or be directly converted as a cost saving.

Another important role is seen in product intelligence. New technologies and products can be followed up closely regarding their technical reliability. This can for example help to better assess the risks of new powertrain technologies or manage liabilities and if required, initiate required actions in time. A focused communication in the case of product recalls and therewith a reduction of reportable cases will help avoid negative image effects.

C) Development of new sources of revenue

OEMs have the opportunity to unlock completely new revenue sources with a connected vehicle. Innovative business models can be developed based on partnering options and will create buying incentives for corresponding solutions. A promising potential could be the cooperation between an OEM, a service provider and an insurance company: the insurer offers its clients a fee reduction if they agree to install stolen vehicle tracking/recovery solutions in their car. This "kick-back" will be perceived as a buying incentive leading to a benefit for the customer, the insurer, the OEM, and the service provider.

Figure 2: Sources of revenue for OEMs



In addition, OEMs can generate revenues on the basis of integrated fleet management solutions. Fleet operators are increasingly asking for management solutions and due to the high degree of specification, they will show a relatively high willingness to pay also in the future. Corresponding solutions are already available for heavy commercial vehicles and the demand is growing for light commercial vehicle and passenger car fleets as well.

Finally, revenues from advertisements can also generate additional earnings; but promotion or advertisement should only be integrated very selectively.

4. OEMs have to create the framework today

The development of customer experience relevant services, the prevention of revenue losses, and the differentiation from competition can be achieved with a three step approach:

I. Trends and Vision: Analysis of major market and user trends is the key to defining the content and setting the optimal scope. Trends of the OEM specific user groups have to be compiled from mobility, information and communication technology, vehicle sales and after sales. Corresponding use cases are the key deliverable resulting from the trend analysis, e.g. infotainment for end customers, fleet services for business customers, remote diagnosis for repair shops, and marketing tools for the OEM itself.

II. Joint Strategy: The top management, the functional units, the development department, and the IT department are jointly responsible for developing the strategy. Cost requirements and earning positions have to be captured and a rough roadmap should compare the expected benefits with the costs and technical feasibility.

III. Implementation Plan: A detailed plan over time has to be developed containing required changes in the internal structural and process related organization. Core competencies and capabilities should be defined and a search for partners for optimal service implementation has to be initiated as soon as possible.

5. Conclusion

The vehicle of the future will be connected but OEMs immediately need to find answers to some key questions in order to make the vision of the connected vehicle a sustainable success story. Even though there is no business case within reach for selected standalone services, OEMs can bundle sources of revenue in a smart way so that urgently needed strategic investments can be justified.

The OEMs should act now, define an overall strategy as well as a roadmap, and enable a capable implementation organization. Only then the connected vehicle dilemma can be overcome and a long-term competitive advantage will be achieved.

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Arthur D. Little

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