

Telematics

Gear Shift in the Automotive Industry

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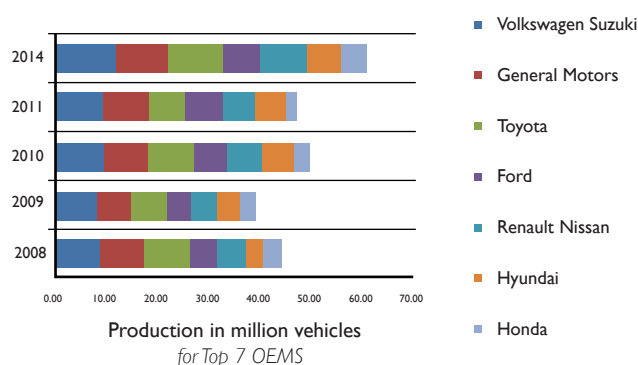
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The opportunity of after sales revenues

The automotive industry has come a long way since the invention of the steam-powered automobile. Over two centuries of continuous industrialization as well as increasing disposable incomes across the globe have created a huge market for the industry. It has spawned an environment conducive for the growth of other industries and thus become a crucial cog in the development of economies worldwide.

The automotive industry is past the gloomy days of 2008-09 with improved consumer spending strongly reflected in auto sales across geographies and OEMs. The number of automotive OEMs has increased, demonstrating the growing opportunity, and markets are brimming with strong competition.



Source: from online sources of annual reports of the OEMs

Markets, especially in developed countries, are saturated. To add to the changing nature of the industry, customer demands across geographies are considerably different.

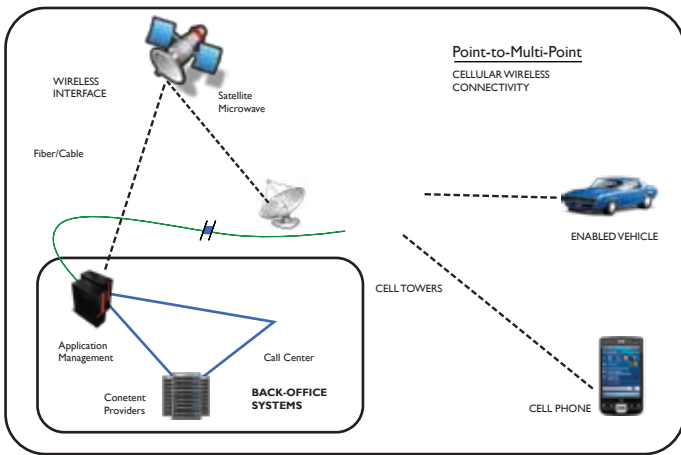
Result? Automakers must seek new business models that go beyond selling their latest models. With a huge number of their vehicles already in the hands of customers, the opportunity for automakers is in after sales revenue streams. Essentially, the model needs to be based on continued spending on the same vehicle rather than a singular focus on driving consumption of new vehicles.

This explains the renewed focus on telematics by the automotive OEMs. Telematics enables OEMs to wirelessly gather a wide range of data, from geo location and usage patterns to maintenance needs and performance information. Through telematics gateways, OEMs have the opportunity to track their customers even after the sale of the vehicle.

Telematics also enables OEMs, their partners and independent content creators and aggregators to deliver content such as maps, weather forecasts, traffic conditions, news, stock quotes, social updates, messages and entertainment to the automobile.

The Emerging Significance of Telematics

Telematics is a communication technology for the automobile industry based on information flowing to and generated from vehicles via wireless networks. It is the convergence of wireless communications, location technology and in-vehicle electronics pushing the automobile industry into the information age.



Data is either generated in the vehicle unit and gets relayed to the back office systems or the back office systems push data like maps, weather forecasts, stock updates, Internet data packets etc to the vehicle unit. This communication takes place either through the cell phone or the unit fitted in the vehicle itself. The communication and location mapping for the vehicle happens through a network of cellular towers and satellite systems.

The different features offered through this system are:

- a) Safety - features such as automatic crash response, emergency and crisis assistance
- b) Security – features such as remote door lock/ unlock, stolen vehicle tracking
- c) Navigation – provides maps, turn-by-turn assistance
- d) Vehicle health reports – diagnostics on the vehicle performance
- e) Internet Connectivity – internet connectivity brings in social networking apps, RSS feeds like weather forecasts, stock updates, news bulletins right into the vehicle
- f) Concierge services – to plan and book itineraries

Telematics is not a recent feature in the automotive Industry. In fact, General Motors - OnStar was the first to explore this technology and venture into it commercially as early as 1996. The prohibitive cost of infrastructure investment and lack of consumer demand, at the time, prevented it from being accepted by the mainstream. Hence, telematics

remained sidelined for some time in the automotive sector.

It was the advent of the smartphones and the subsequent consumer demand for instant and constant connectivity that revived telematics and made it a serious contender in the automotive industry.

Most telematics setups can now use smartphones to connect to the vehicle providing access to content from industries like media, banking and insurance. These combined reasons have added a fillip to the telematics phenomenon.

Based on the surge of demand, telematics sales in OEMs are expected to grow (see table below).

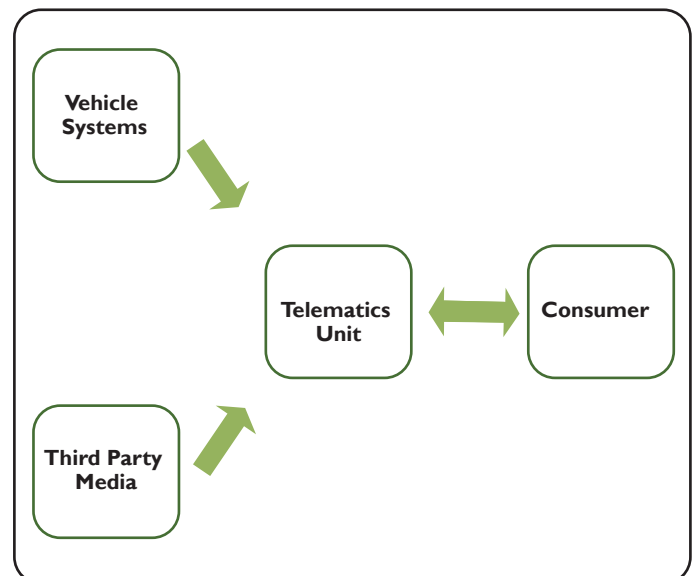
OEM Annual Sales of Telematics (in US\$ millions)				
	2007	2012	2015	2020
USA Monitored Telematics Sales	3.5	7.5	11.8	17
EU Monitored Telematics Sales	0.5	2.4	7.2	15
Japan Monitored Telematics Sales	0.6	1.7	4	5.5
Worldwide Monitored Telematics Sales	5.2	14.5	30	50

Source: Telematics Research Group, Inc (TRG)

Given these forecasts and the close association of telematics with IT, technology companies with automotive domain competencies will see a substantial opportunity building up.

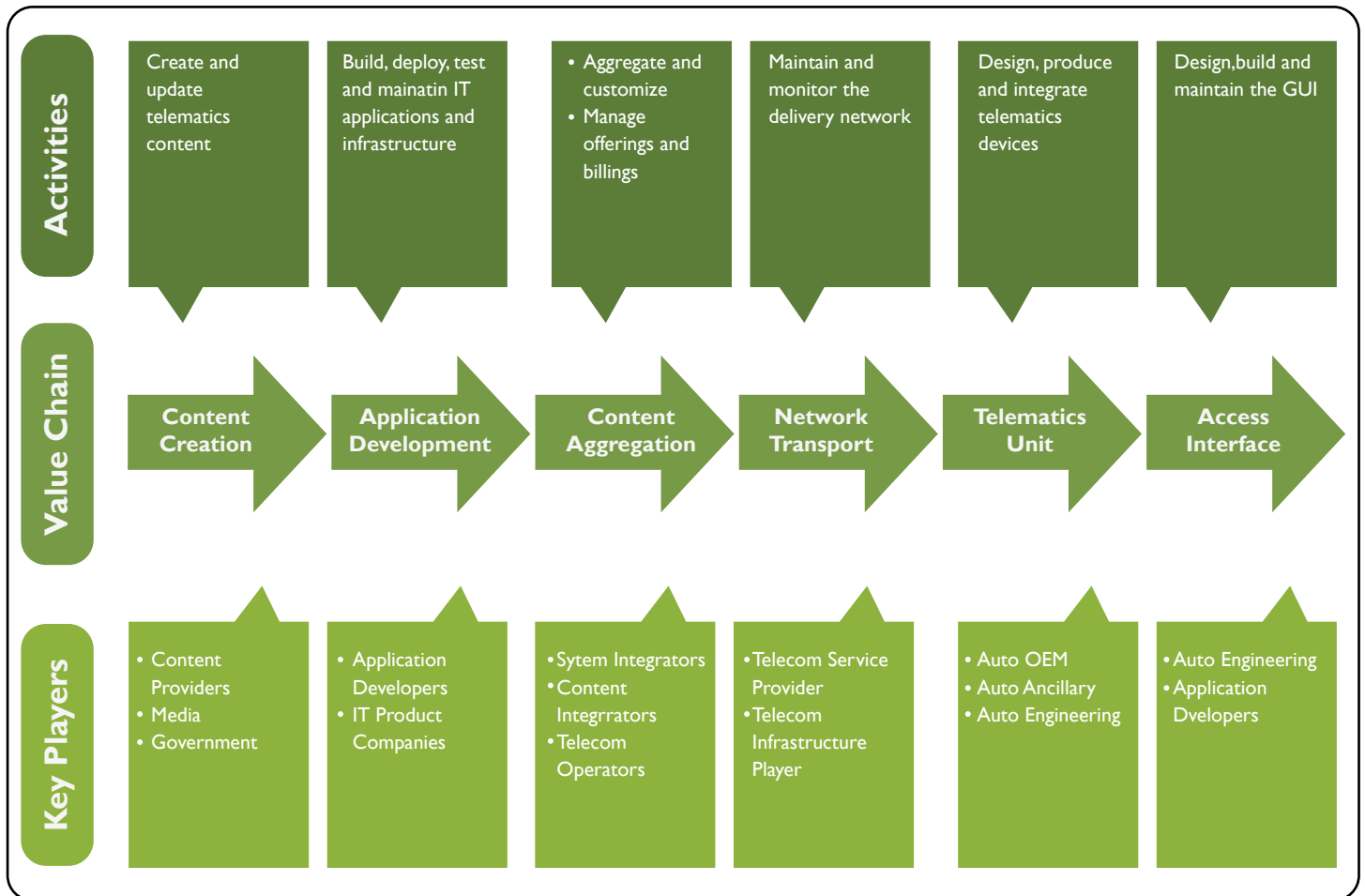
Value Chain in Automotive Telematics

To identify the opportunities for IT in telematics, we need to understand and analyze the value chain in this domain, as indicated by the following:



Telematics Unit is the communication component that talks directly with the vehicle. There are two data sources for the unit – the vehicle itself and third party media content beamed from the outside world. This third party content is primarily Internet driven data, voice and video content provided by web portals. The consumer can either be the vehicle driver/ passengers accessing the data or the entities that want to use vehicle generated content.

IT intervention and involvement is required across the telematics value chain as is evident from the diagram below.



The core value in the telematics value chain is the data content. The source of the data content is either the vehicle's systems that track parameters related to the vehicles performance or external/ third party media content beamed in through the telecommunication networks. From left to right, data flows from the source to the target.

• **Content Creation**

Content relates to the media and entertainment data consumed by the subscribers in the vehicle. It ranges from social networking related content – photos, videos, chats - to navigation information such as maps, points of interest like news, stock information and weather updates. Players in this segment are content providers like social networking websites, media organizations, map databases and government agencies.

• **Application Development**

To remain competitive, content creators need to constantly innovate in terms of the offerings provided. Content generation and upgrades are a continuous process and warrants a stable, integrated and efficient information technology system. Application development and maintenance along with information technology infrastructure is mandatory for each of the sources mentioned in the content creation segment.

• **Content Aggregation**

Customized content needs to be delivered to the target consumer. For example, in some locations, certain government regulations restrict the usage of social networking sites; while in other geographies, such content can be accessed freely. Similarly, there are several other policies that restrain the content that can be provided in a telematics setup. Technology helps manage the customization as well as track and manage revenue from these offerings.

• **Network Transport**

The content generated, particularly via third parties, in the vehicle will reach the telematics unit directly. It will not connect to the network for transport to the target.

Typically, there are two ways in which the third party content reaches the target subscriber. One is through the dashboard of the vehicle, which connects to the cellular network to receive and display the content. The other is the regular cell phone, which connects to the cellular network for data.

Telecom service providers and the infrastructure players operate in this segment and cater to the provisioning and management of the cellular networks.

Telematics Unit

Telematics Unit is the point where all the vehicle data is aggregated and updated. It connects to the cellular networks to download and display third party content. Therefore, this unit can connect both to the vehicle systems and the telecommunication network as well. Automotive OEMs, Automotive Ancillaries and Automotive Engineering players design, build and produce these devices to be implemented in the vehicles.

Access Interface

This is the GUI that reaches the target consumer. In the vehicles, this is the dashboard that displays the content generated within the vehicle systems and the third party content from the telecommunication network. Application development for this dashboard is either done in-house or outsourced to a third party vendor.

Business Models and Applications of Telematics

Based on the value chain, there are three business models that emerge.

Business-to-consumer telematics

This is the most widely adopted model with OEMs offering customers subscriptions for different services. Partnering with third party content aggregators to provide these services is the norm.

Services in this section include:

- Navigation – maps, turn by turn routing
- Location Based Services (LBS)
- Traffic related data
- Entertainment – Internet radio, Pandora
- Information – weather, news, stock prices

Business-to-product telematics

Here OEMs use the data pulled from the vehicle to track usage and hence offer preventive maintenance. This model, though just emerging, provides opportunities for cutting costs through warranty predictions and helps OEMs discover new services to offer customers.

Services under this section include:

- Vehicle health reports
- Vehicle servicing reminders and alarms
- Fault predictions
- Warranty support

Business-to-business telematics

OEMs continuously gather data from vehicles, some of which are of utility to third party businesses that can offer customized solutions. This model has recently come in for considerable attention as it holds the potential of a revenue stream that spans the vehicles lifecycle. There are different businesses that fit this segment:

- **Insurance:** Automotive insurers can track driver behavior and vehicle usage patterns to prove accurate premium ratings. Usage based insurance like Pay-As-You-Drive benefit enormously from telematics. Data mining can aid pattern recognition that can be used for fine-tuning insurance scheme proposals to fit the demography and geography.
- **Media/ Content Providers:** Web portals can beam content into vehicles – streaming audio and video as well as customized data such as RSS feeds for weather and stock data, news bulletins or social networking updates. Essentially, the vehicle becomes the new content distribution and consumption platform.

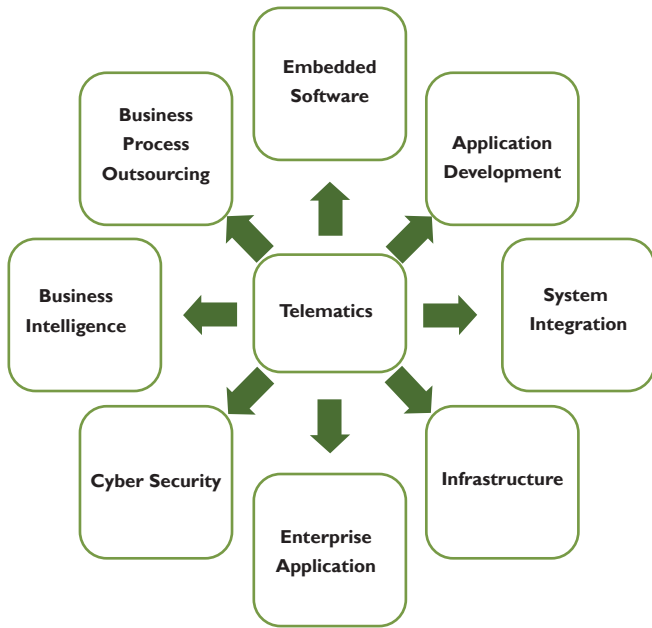
Besides these, there is also a revenue opportunity in providing geography specific information like restaurants, shopping offers and traffic updates to passengers.

- **Logistics Industry:** Telematics can aid in better commercial fleet management by improved tracking, flexibility in route planning, efficient use of capacity, reduced fuel consumption and thereby higher revenues.
- **Green Telematics in Automotive OEMs:** Environmental concerns and government regulations are compelling OEMs to incorporate fuel-efficient measures in vehicles. Telematics delivers real time data on driving patterns, routes covered, engine parameters – all of which can be used to enforce environment compliant policies.
- **Telecommunication:** Telecommunication equipment manufacturers can utilize or enhance the network layout to cater to the infrastructure demands of telematics services. The telematics service provider pays for network transport and service delivery while the subscriber pays for time or data usage to the telecommunication service providers.
- **Utilities:** The electric vehicle segment relies on power utilities for charging the vehicle. These utility companies need to track charging schedules for vehicles to optimize the power supply through the day. Data gathered from the telematics units as the vehicles are charged

will provide a characterization of consumer behavior and identify potential incentives for electric vehicle charge stations.

Opportunities for Service Providers

Looking at the value chain and its applications, there is ample scope for information technology service providers to provide solutions.



• Embedded devices and software

Product engineering solutions functioning in the automotive engineering space can target the telematics unit to provide embedded solutions. Component design and development based on CAD/ CAM/ CAE is also another target area for IT solutions.

• Application development

Applications will be the crucial cog in this telematics industry. These applications range from within the car to businesses that would leverage the data generated from the vehicle.

A few examples:

- In-vehicle software on the dashboard - vehicle health data
- Smartphone Applications
 - Video and audio – media and entertainment
 - Data - weather, stocks, news bulletins
 - Transaction – banking, online shopping/ booking for restaurants, movies, travel.

Back office setup to support telematics features

• Enterprise Package Implementation

As the consumer base grows, automotive OEMs as well as the telecommunications providers will seek enterprise applications like enterprise resource planning, customer relationship management, supply chain management, human resource management among others to efficiently and effectively manage the growth. Solution providers may look at software as a service or cloud to drive home more cost effective packages.

• Systems Integration

Telematics is a convergence of different existing industries and hence there is need for applications and system integration of the different players involved. As technology evolves, middleware implementation will become an important need for binding together disparate systems.

There is an opportunity to integrate the different systems under Automotive OEM itself as well as those of telecommunications provider and third party systems like banks, Internet with those of the OEM.

• Infrastructure

Expand the network infrastructure to cater to the surge in spectrum usage for the telecommunication providers. Besides this, there will be huge volumes of data generated through transactions in the telematics space.

This spells an opportunity for the IT infrastructure vendors to provide their storage products and solutions through virtualization or onsite deployments.

• Cyber security

Data flows to and from the vehicle over the wireless network. This exposes the consumer as well as the automotive OEM to the risk of cyber espionage. With stricter regulations over data usage and theft coming into force, cyber security will need to be ramped up to ensure the sustainability of the telematics industry. This implies that enterprise security solutions will become a focus for the entire value chain starting right from the telematics unit to all the applications that access the telematics unit.

• Business Intelligence and Analytics

Huge volumes of data imply a significant scope for data mining to analyze the patterns across subscriber application usage and vehicle usage. The data generated from the telematics systems can be leveraged to devise plans to improve customer retention and acquisition for the automotive OEMs as well as third party players like telecommunication service providers, retailers, banks and insurance firms.

• **Business Process Outsourcing**

Automotive OEMs have back office setups- call centers and emergency help units to cater to the telematics consumers. Besides, as the telematics industry matures, there will be defined processes across the value chain. This opens an opportunity for business process outsourcing - voice and non voice BPO. Solution providers can leverage the domain expertise built over years of automotive work to win in this space.

Challenges Facing the Telematics Industry

Looking at the value chain and its applications, there is ample scope for information technology service providers to provide solutions.

Collisions on clock speeds

One of the most critical challenges for OEMs is the pace of change in the consumer electronics industry. The product life cycle in the electronics industry is much shorter as compared to the automotive industry. This phenomenon is explained by the concept of Clockspeed – the rate of evolution of processes, products and organizations overall. Clockspeed Analysis is a method of understanding product lifecycle acceleration, modular architecture and supply chain design to create or maintain competitive advantage.

Industry	Product Tech Clockspeed	Process Tech Clockspeed	Organizational Clockspeed
Automobiles	4-6 yrs	4-6 yrs	10-15 yrs
Semiconductors	4-6 yrs	2-3 yrs	3-10 yrs
Personal Computers	< 6 months	2-4 yrs	2-4 yrs

Source: Analysis of Automotive Telematics Industry in Japan by Norihito Shimizu

A boundary is created when two industries that evolve at different clock speeds come together. With respect to telematics, the pace of evolution in the two industries is quite different. This phenomenon is creating unwanted stress on the OEMs to speed up the upgrades for the electronics features and thereby avoid repeated obsolescence.

Delivery styles

Provisioning telematics has evolved into two distinct schools of thought. In-car telematics is being aligned based on these lines and as we move towards increasing adoption, we shall see further refining of these approaches.

i) **Coffee maker approach:** This approach refers to the branded, embedded, carefully curated in-car services. Classic examples are - GM OnStar, Mercedes mBrace. In this approach OEM integrates all the pieces in the frame. Car manufacturers earn recurring, incremental revenue from data subscriptions, but handling the service comes with incremental expenses, including providing support for third-party software and services.

ii) **Coffee Cup Holder Approach:** This approach refers to the telematics systems that use smartphones as the conduit for services. A classic example is the Ford Sync. Application and content developers do not need to reinvent the wheel by porting or rewriting their applications for proprietary in-auto systems. OEMs earn their slice of revenue from paid applications delivered to the car in return for acting as a distribution channel.

iii) **Hybrid Approach:** Industry analysts believe that a hybrid approach will emerge combining the OEM driven branded services with the cell phone managed services.

Government Regulations

The telematics market largely depends on government regulations. These regulations, though in the nascent stages, vary across geographies. Restrictions levied on the availability of map data as well as digital maps are creating concerns for solution providers. Another major concern is that the influx of consumer products is overloading drivers with cell phones that are being criticized for distracting drivers. As telematics enters the mainstream, there are increasing chances that there will be deeper scrutiny and tighter regulations.

Conclusion

The automotive industry is at different stages of growth across geographies. But given the market dynamics, automotive OEMs will, sooner rather than later, embrace telematics fully across markets. Irrespective of the challenges hovering on the horizon, information technology service providers have ample opportunities to create a leadership position in this space through multiple technology and domain offerings.

About the authors

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