The quest for telematics 4.0

Creating sustainable value propositions for connected car
Executive summary

The global telematics market is poised to grow exponentially, with approximately 104 million new cars expected to have some form of connectivity by 2025.

All stakeholders need to be continuously evolving their business strategies in order to gain ownership of end customers.

Low subscription take-up rates forcing stakeholders to revisit packaging and charging of services.

Suggested packaging of end customer services
- Bundled basics
- Pay-per-use and freemium services
- Premium subscription services

Telcos need to develop their role in the deployment of telematics services.
- Ensuring ubiquitous network coverage
- Leveraging core competencies to offer value-add services to automakers
- Offering solutions for anchor services

Wider range of revenue-generating opportunities for telcos as embedded connectivity is likely to become prevalent in future.

Telcos should form strategic alliances and partnerships with other stakeholders in the ecosystem to offer ...
- Telematics service platform/access portal
- Content and application integration services
- Security services
- Customer support services
The study aims to cover key considerations for telcos as past telematics business models have not been very successful, and huge potential remains untapped.

## Agenda

### Key considerations for telcos

<table>
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<th>Why should you consider the telematics industry?</th>
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<tr>
<td>► What is the market potential?</td>
</tr>
<tr>
<td>► What is the regulatory scenario?</td>
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<table>
<thead>
<tr>
<th>What is the telematics industry scenario?</th>
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<tbody>
<tr>
<td>► What is the telematics ecosystem?</td>
</tr>
<tr>
<td>► What are the various telematics strategy variants?</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>What are the implications for telcos in the telematics industry?</th>
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<tbody>
<tr>
<td>► Which services act as critical enablers for telcos?</td>
</tr>
<tr>
<td>► What should the value proposition be?</td>
</tr>
<tr>
<td>► What are the emerging roles for telcos?</td>
</tr>
</tbody>
</table>
Telematics market, ecosystem and business strategy variants
Telematics market drivers
The need for ubiquitous connectivity is fueling mobile broadband penetration

Mobile vs. fixed-line broadband subscribers (2010–16)

- Mobile broadband forecast to grow at a much higher rate than fixed broadband.
- Huge disparities between mobile-broadband penetration in the developing (8%) and the developed markets (51%); however, the gap is bridging rapidly.¹
- In 2011, 144 million mobile broadband subscriptions added in the BRICS, accounting for 45% of the world’s total added in 2011.²

Smartphone total annual shipments (2010–16)

- Connectivity is on the go, hence there has been a significant increase in the uptake of smartphones.
- On an average, a smartphone is capable of generating 50 times more data than a feature phone, and by 2015, smartphones are expected to account for 50% of the total handsets shipped.³
- Global mobile data traffic is expected to increase 13 times between 2012 and 2017, with rich and high-definition mobile video accounting for 66% of this traffic by 2017.⁴

Note: “BRICS” refer to Brazil, the Russian Federation, India, China and South Africa.
2. Ibid.
Telematics market drivers
Urbanization is on the rise, with various countries implementing intelligent transport solutions

Passenger travel distance to almost double by 2050
- China, Latin America and India to witness the fastest growth in passenger travel.
- Average per capita personal travel ranges from a low of 1,700km per year in Africa to 21,500km per year in North America.

Delay hours due to congestion to almost double by 2050
- Passenger travel growth to outpace expansion of transport infrastructure.
- Urban mobility systems exhibit increasing congestion with decline in travel speeds.


Telematics supporting intelligent transportation solutions

Smart cars interacting with smart grids to optimize energy consumption
- Developing communication systems among the driver, car and power grids.
- Smart charging capability to manage the power used by electric vehicles (EVs), such as for e.g., adjustments in charging based on load.
- Intelligent charge management with EVs capable of feeding electricity back into the grid.
- Collate historical EV charging data and create a profile to forecast the location and duration of EV charge loads.

Smart cars enable faster journey times
- Receive information from other cars to enable route optimization.
- Car-to-traffic light communication to inform drivers.
- Optimization of vehicle speed to enable phased traffic lights
- Optimization of traffic lights by traffic information.

Smart cars enable mobility
- Connectivity not just between cars, but between different modes of transport.
- Optimization of smart car speed to provide seamless travel across different transport modes.
- Not just route optimization, but also transport mode optimization.

Impact

Various countries/cities implementing intelligent transport systems (ITS) boosting telematics (especially embedded telematics)
**Telematics market drivers**

Favorable legislation in a number of countries presents an encouraging scenario

|----------------|-----------------------|--------------------------|---------|---------|---------------------|
| Europe         | European Union has announced “emergency call” (eCall).  
► It will likely be made mandatory by 2015. | High | ✔️ |  | Provide boost to telematics services |
| Brazil         | Brazil’s CONTRAN 245 resolution requires all new vehicles be fitted with an antitheft device.  
► It is intended to reduce car thefts and vehicle insurance rates. | High | ✔️ |  |  |
| Russia         | In 2009, Russia decided to set up a countrywide emergency call service for road accidents.  
► The service, ERA GLONASS, is likely to be launched in 2013. | High | ✔️ |  | Since most legislation will require the vehicle to have built-in SIM, “embedded telematics” will benefit the most |
| India          | Russia and India have a joint venture to provide navigation services in India (using Russia’s GLONASS), which includes setting up the telematics terminals and portable navigation devices. | Medium |  | ✔️ |  |
| China          | Government is investing billions of dollars in telematics, with emphasis on “connected car” development.  
► Government will roll out policies aimed at ITS. | Medium |  | ✔️ |  |

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5. Ernst & Young analysis.
Telematics market drivers
Growing consumer demand for electric vehicles will lead to investments in telematics

Global penetration of EVs
In thousands

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012f</th>
<th>2013f</th>
<th>2014f</th>
<th>2015f</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17</td>
<td>76</td>
<td>221</td>
<td>493</td>
<td>853</td>
<td>1,292</td>
</tr>
</tbody>
</table>

CAGR: 137%


Telematics: an essential for EVs

- **Lower range anxiety**
  - Telematics solutions locate nearest charging station.
  - Make reservations at charging station.

- **Managing the charge of vehicle**
  - Check vehicle’s charging status remotely.
  - Control when the vehicle charges (users can charge during off-peak hours when rates are lowest).
  - Notify owners when the charging stops or is unplugged.

- **Remote HVAC control**
  - Use remote heating, ventilating and air conditioning (HVAC) crucial for EVs.
  - Embedded telematics to gain popularity as EV sales increase

Consumer demand

<table>
<thead>
<tr>
<th>Industry</th>
<th>Benefit</th>
<th>Impact</th>
</tr>
</thead>
</table>
| **Insurance** | ► Correct risk assessment  
► Verify authenticity of claims  
► Identify customer’s training needs | ► Enable lower premiums for safe drivers while penalizing rash drivers  
► Fight fraudulent claims  
► Differentiate brand  
► Retain profitable accounts  
► Better ROI |
| **Fleets** | ► Optimize routes  
► Track vehicles  
► Use preventive maintenance through vehicle diagnostics  
► Identify driver training needs | ► Enhance customer service (timely delivery and appointments)  
► Enhance driver safety and vehicle security  
► Lower fuel and maintenance cost  
► Reduce premiums and self-insurance costs  
► Better ROI |
In-car connectivity — huge potential remains untapped
Providing in-car connectivity is going to be essential for every automaker, but the industry is still looking for viable business models.

The global telematics market is poised to grow exponentially in the future, with approximately 104 million new cars expected to have some form of connectivity by 2025.6

Penetration of global integrated telematics to reach 88% for new cars by 2025, while that of tethered telematics to flatten to around 28%.7

US to continue its lead with sales of approximately 16 million new cars with embedded telematics by 2025.8

EU, Japan and BRIC nations present huge potential, primarily due to upcoming regulations.

7. Ibid.
8. Ibid.
Embedded telematics is the fastest-growing segment

- Global market has expanded rapidly over the past few years and is set to grow at a CAGR of 25% during 2012–25.
- In the medium term (up to 2020), lower cost for the integrated systems will be the biggest driver, resulting in a high sales growth.
- Embedded systems forecast to have a higher growth in the long term (2020 and beyond), driven by upcoming regulations focusing on driver security.
- Market volumes high for the US at present while the EU, Brazil, Russia and China present a very high potential due to anticipated regulatory changes.

Global original equipment (OE) telematics sales by connectivity


Original equipment (OE) embedded telematics sales by region

<table>
<thead>
<tr>
<th>Region</th>
<th>CAGR (2011–15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>14%</td>
</tr>
<tr>
<td>EU</td>
<td>34%</td>
</tr>
<tr>
<td>Japan</td>
<td>29%</td>
</tr>
<tr>
<td>Brazil</td>
<td>128%</td>
</tr>
<tr>
<td>Russia</td>
<td>94%</td>
</tr>
<tr>
<td>India</td>
<td>115%</td>
</tr>
<tr>
<td>China</td>
<td>50%</td>
</tr>
</tbody>
</table>

The evolving connected car ecosystem
Effective delivery of connectivity-based services will require seamless integration of infrastructure by various stakeholders.

### What are the telematics end services?

<table>
<thead>
<tr>
<th>Vehicle-independent services</th>
<th>Vehicle-dependent services</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-demand infotainment</td>
<td>Safety and security</td>
</tr>
<tr>
<td>Navigation</td>
<td>Diagnostics</td>
</tr>
<tr>
<td></td>
<td>Vehicle-to-vehicle</td>
</tr>
<tr>
<td></td>
<td>Other services*</td>
</tr>
</tbody>
</table>

### How are telematics services delivered?

<table>
<thead>
<tr>
<th>Service delivery infrastructure</th>
<th>User interface</th>
<th>Wireless network (connectivity)</th>
<th>Customer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive industry</td>
<td>Government</td>
<td>Telematics service provider</td>
<td>Insurance industry</td>
</tr>
<tr>
<td>Information technology</td>
<td>Telecoms industry</td>
<td>Device manufacturers</td>
<td>Others**</td>
</tr>
</tbody>
</table>

### Stakeholders

- Automotive industry
- Government
- Telematics service provider
- Device manufacturers
- Information technology
- Telecoms industry
- Information technology
- Insurance industry
- Others**

*Include usage-based insurance, fleet management and payment (tolling, parking), etc.
** Include BPO and roadside assistance providers
Key strategies for telematics 4.0
All the stakeholders must continuously evolve their business strategies in order to gain ownership of end customers

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Risk</th>
<th>Reward</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Infrastructure and content partners</strong>&lt;br&gt;Providers who deliver the hardware, communications and content to create a strong telematics connection.</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>2</td>
<td><strong>Proprietary navigation and infotainment</strong>&lt;br&gt;Providers who offer specific vehicle-independent services that are delivered through either bolt-on appliances or download.</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td><strong>Carmaker — branded connectivity</strong>&lt;br&gt;Providers who offer content, communications, maintenance diagnostics and CRM service, probably through a browser-like interface.</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td><strong>Branded aftermarket connectivity</strong>&lt;br&gt;Providers who offer similar services for the aftermarket, somewhat lighter on diagnostics, and include insurance telematics.</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
Low subscription take-up rates forcing stakeholders to revisit packaging and charging of services

<table>
<thead>
<tr>
<th>Current scenario</th>
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<tbody>
<tr>
<td><strong>Free period</strong></td>
</tr>
<tr>
<td><strong>Subscription period</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Considerations</th>
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<tbody>
<tr>
<td>► How to increase the subscription rate for services through the correct packaging?</td>
</tr>
<tr>
<td>► What services should be offered for free?</td>
</tr>
<tr>
<td>► What should the charging mechanism be for services (subscription, pay-per-use, etc.)?</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Suggested packaging of end customer services</th>
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</thead>
<tbody>
<tr>
<td><strong>Bundled basics</strong></td>
</tr>
<tr>
<td>Safety and security services that will be required by law or market conditions, such as emergency call services, stolen vehicle tracking and basic navigation services. While their cost will be built into the vehicle's price, stakeholders — particularly carmakers and dealerships — will have to generate returns through operational efficiencies and by cultivating a closer connection with the customer. There are short-term opportunities to generate subscription revenues, but only until regulations standardize the installation of basic black boxes for safety and security services.</td>
</tr>
<tr>
<td><strong>Pay-per-use and freemium services</strong></td>
</tr>
<tr>
<td>Navigation, entertainment or similar applications that are mostly supported by advertising or paid for with each use, somewhat like a pay-as-you-go mobile phone data plan. In this case, the limited revenues may be shared among the carmakers, content providers and telcos.</td>
</tr>
<tr>
<td><strong>Premium subscription services</strong></td>
</tr>
<tr>
<td>Applications that car owners are willing to pay for on a contractual basis, such as access to integrated mobility solutions and in-car occupant health services. In this context, the carmaker may own a significant proportion of the cost and subscription revenue stream. Similarly, telcos can charge end customers on the basis of type and quality of connectivity that they opt in to.</td>
</tr>
</tbody>
</table>
Scenario for the telecoms industry
Service offerings by telcos for deployment of connected car services

Service delivery architecture

- Telematics service platform/access portal
- System upgrades
- Cloud services for connected devices
- Large-scale data collection/data mining/management
- M2M service
- Security services
  - Network security and user authentication

- Content creation
- Content aggregation
- Application development
- Application delivery

User interface

- Device-to-vehicle connectivity:
  - Embedded
  - Tethered
  - Integrated
- Human-machine Interface:
  - Visual
  - Haptic
  - Voice

Wireless network (connectivity)

- Low-speed data services (2G)
- High-speed data services (3G or LTE)

Customer support

- Call centers
- Subscription management
- Charging and billing
- Online support

Services that act as key differentiators for telcos

Services where telcos could play a role in future

Services where telcos are not expected to play a role at all
## Cases of key telcos offering connected car services

<table>
<thead>
<tr>
<th></th>
<th>Deutsche Telekom</th>
<th>Vodafone</th>
<th>Telenor Connexion</th>
<th>Telefonica</th>
<th>AT&amp;T</th>
<th>YTL communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-demand infotainment</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Navigation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Safety and security</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Vehicle-to-vehicle</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Others</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td></td>
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</tr>
</tbody>
</table>
Wider range of revenue-generating opportunities for telcos as embedded connectivity is likely to become prevalent

Triggers for migration toward embedded telematics ...

Government legislation
- Governments in various countries have announced plans to launch telematics-related mandates on services such as emergency call and stolen vehicle tracking.
- All of these mandates are expected to require (or strongly recommend) embedded telematics, which should reduce the cost of hardware for consumers.

Web-based apps to reduce the need for smartphone integration
- Decoupling of apps on phones may happen in the future, as more content and services are shifted to being hosted in the cloud rather than on native apps.
- This could lead to increased use of embedded telematics and reduce the need for smartphone integration in the longer term.

Shared data plans to reduce need for additional car subscription
- Solutions such as shared data plans, split billing and reprogrammable SIMs could lead to significantly more attractive pricing models for embedded telematics.
- Such plans would enable customers to pay a single bill and access the same data plan via multiple devices, eliminating the need for additional car subscription.

... opening up new revenue opportunities for telcos

- M2M service
- Device management
- App store support
- Charging and billing
- Customer relationship management solutions
- Cloud services for connected devices
Telcos need to progressively evolve their role in the deployment of telematics services …

1. Ensuring ubiquitous network coverage
   - Telcos need to ensure that connection is available at all times and everywhere to allow a seamless user experience.

2. Leveraging core competencies to offer value-add services to automakers
   - Support for customized charging and billing services
   - Access portal integration
   - Content and application integration
   - Security services

3. Offering solutions for anchor services
   - Emergency call
   - Stolen vehicle tracking
   - Diagnostics services

M2M portal services for embedded applications such as emergency call, stolen vehicle tracking, and diagnostics services.

Impact

Generate necessary demand for widespread deployment of telematics services and associated revenue opportunities.
… actively involve themselves in the value chain to generate incremental revenue opportunities …

**Telematics architecture**

- **Who owns the customer?**
  - VM: Vehicle manufacturer
  - Telcos
  - M2M SP
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Who provides the necessary infrastructure?**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Who are the niche service providers?**
  - TSPP
  - TSPP
  - ITSC
  - ITSC
  - ITSC
  - PND
  - PND
  - PND
  - PND
  - BPO
  - BPO
  - BPO
  - BPO
- **Ecosystem presence**
  - Telco
  - Telco
  - Telco
  - Telco
  - Telco
  - Telco
  - Telco

**Who provides the necessary infrastructure?**
- **Telematics service platform/access portal**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Security services**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Content and application integration**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **User interface**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Wireless network (connectivity)**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
- **Customer support**
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos
  - Telcos

**Key players**
- **VM:** Vehicle manufacturer
- **INS:** Insurance provider
- **SC:** Repairer network/service center
- **PSV:** Packaged software vendor
- **PND:** Portable navigation device manufacturer
- **TSC:** IT service company
- **M2M SP:** Machine-to-machine service providers
- **SPM:** Smartphone manufacturer
- **TSPP:** Telematics service platform providers
- **RAP:** Roadside assistance provider

**Table of roles**
- **Future role**
  - Telco
- **Present role**
  - Telco

**Diagram notes**
- **Telco** (Future role)
- **Telco** (Present role)
... and form strategic alliances and partnerships with other stakeholders in the ecosystem

<table>
<thead>
<tr>
<th>Services</th>
<th>Current scenario and opportunity for telcos</th>
<th>Optimal scenario for Telcos</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telematics service</td>
<td>▶ At present, auto manufacturers partner with TSPP for this facility.</td>
<td>▶ Telcos need to partner with auto manufacturers to help them activate, maintain and upgrade services controlled by them or third-party providers.</td>
<td>▶ Telcos to play an active role in the connected car ecosystem by managing various aspects of TSP platform, especially opportunity to provide M2M service and large-scale data management.</td>
</tr>
<tr>
<td>platform/access portal</td>
<td>▶ Telcos have the capability to support platforms in integration of technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content and application</td>
<td>▶ Auto manufacturers are keen on developing their own vehicle-centric application stores. At present, PSV and SPM have taken a lead in this space.</td>
<td>▶ Telcos can support the auto manufacturers in deployment of their app store, either through white-label platform or through the provision of specific support services to these platforms.</td>
<td>▶ Telcos to gain a percentage of revenue share by developing applications for auto manufacturers rather than just acting as dumb pipes.</td>
</tr>
<tr>
<td>integration</td>
<td>▶ Many telcos have their own app stores.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security services</td>
<td>▶ Currently, auto manufacturers have collaborated with TSPP and ITSC to provide security services.</td>
<td>▶ Telcos could also act as an additional firewall between the car and the outside world in order to block malware or unauthorized activities.</td>
<td>▶ Makes for a good business case to endorse other services such as access portal and application stores, especially when telcos can guarantee personal data security.</td>
</tr>
<tr>
<td></td>
<td>▶ Telcos already have extremely secure networks to avoid unauthorized access and fraud.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer support</td>
<td>▶ Auto manufacturers, in partnership with other telematics stakeholders, directly engage with customers to provide customer support services.</td>
<td>▶ Telcos could partner with auto manufacturers or act as a standalone entity to provide end-to-end customer support services as they possess necessary expertise.</td>
<td>▶ Telcos to gain more revenues as they already have the necessary infrastructure in place.</td>
</tr>
<tr>
<td></td>
<td>▶ Telcos already provide customer support services to millions of their subscribers.</td>
<td></td>
<td></td>
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</tbody>
</table>
Telcos will have an opportunity to claim the only hours in the day still largely out of broadband’s reach. This creates additional usage of their networks and more revenue. However, they need to:

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Service offerings</th>
<th>Collaboration and partnerships</th>
<th>Pricing and billing services</th>
<th>Organization structure</th>
</tr>
</thead>
</table>
| 1              | ► Offer 4G/LTE connectivity to offer high bandwidth services such as internet gaming and videoconferencing for passengers  
                 ► Focus on network security for vehicle-related data  
                 ► Use a telematics service platform to offer end services either directly to the customers or in collaboration with carmakers  
                 ► Leverage data collection/mining capabilities to support carmakers |
| 2              | ► Partner with carmakers to offer customer support services such as subscription management and online support  
                 ► Partner with various sector stakeholders to launch services in the aftermarket |
| 3              | ► Provide flexible data plans such as shared data plans or split billing services  
                 ► Deliver pricing plans that prevent cannibalization of existing customer smartphone usage but do not require customers to miss out on the utility of any existing SIMs and plans |
| 4              | ► Create organizations that focus on automotive as key segment to resist being relegated to commodity status of a “dumb pipe” |
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