Business Model Innovation through the Internet of Things

The connected car industry

Franz Tschimben
Franz? Who?

Academic career

University of Bolzano

ESADE Business School Barcelona

University of St. Gallen, Switzerland

Fulbright @ Santa Clara University


Dr. Schär in Italy

SAMSUNG in South Korea

Accenture Consulting

Savari

Professional career

Dr. Schär}

SAMSUNG

Accenture

Savari
1. Proximity to leading institute (HSG) and practical insights (Bosch IoT Lab)
2. Automotive is the industry most impacted by IoT (together with home automation)
3. Personal professional path
Relevance of Topic

Expectations

- Consumer 3D Printing
- Big Data
- Natural Language Question Answering
- Internet of Things
- Speech to Speech Translation
- Mobile Robots
- 3D Scanners
- Neurobusiness
- Biochips
- Autonomous Vehicles
- Prescriptive Analytics
- Affective Computing
- Electrovibration
- Volumetric and Holographic Designs
- Human Augmentation
- Brain Computer Interface
- 3D Bioprinting
- Quantum Computing
- Smart Dust
- Bioacoustic Sensing

Quantified self

- Consumer 3D Printing
- Gamification
- Wearable User Interfaces
- Complex Event Processing
- Content Analytics
- In-Memory Database Management Systems
- Virtual Assistants

- Augmented Reality
- Machine-to-Machine Communication Services
- Mobile Health Monitoring
- Near Field Communication
- Location Intelligence
- Biometric Authentication Methods
- Consumer Telematics
- Mesh Networks: Sensor Cloud Computing
- Activity Streams
- Gesture Control
- In-Memory Analytics
- Virtual Reality

Innovation Trigger
- Peak of Inflated Expectations
- Through of Disillusionment
- Slope of Enlightenment
- Plateau of Productivity

Plateau will be reached in
- less than 2 years
- 2 to 5 years
- 5 to 10 years
- more than 10 years
- obsolete before plateau

3/3/2015

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Thesis structure

1 Academic

- Business Model
- Business Model Innovation
- Internet of Things

2 Practical

- Deep dive into the connected car industry

Steps

1. Definition of terms (BM, BMI, IoT)
2. Business model patterns in IoT
3. Business model patterns in con. car
4. Qualitative expert interviews
5. Definition of applications (6)
6. Qualitative expert interviews
Definition of Terms

Business Model

Business Model Innovation

Internet of Things
Definition of Terms

**Magretta, 2002**
Business model made of two sets of activities: Making something and selling something

**Gassmann, Frankenberger and Csik, 2013**
Business model defined along four dimensions:
1. The target customer (Who?)
2. The value proposition (What?)
3. The value chain (How?)
4. The financials (Profit?)

**Zott & Amit, 2001**
Business model definition as a depiction of “content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities”

**Chesbrough & Rosenbloom, 2002**
Mediating business model with six functions: Value proposition, market segment, value chain, cost structure and profit potential, value network of the firm, competitive strategy

**Osterwalder 2004**
Business model made of nine building blocks: value proposition, customer segments, key channels, customer relationships, key resources, key activities, key partners, revenue streams and cost structure

**Osterwalder & Pigneur, 2009**

**Business Model Innovation (Chapter 1.6)**
Definition of Terms

Definition of Terms (BM, BMI, IoT)

What?
Value proposition

Who?
Target Customer

Profit?
Financials

How?
Value chain

Qualitative Expert interviews

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Definition of Terms

**What?** Value proposition

**Who?** Target Customer

**Profit?** Financials

**How?** Value chain

*In red:* Business Model Innovation - Changing at least to aspects of the existing business model. Also by applying business model patterns from other industries.
Definition of Terms

In red:
Business Model Innovation - Changing at least to aspects of the existing business model. Also by applying business model patterns from other industries.
Definition of Terms

55 Business Model patterns

Examples (3/20)

- **Add-on**: The client uses a product or service at some cost. When the client makes use of the possibility to add additional features to the existing product or service offering the cost increases - often dramatically.

- **Freemium**: The client uses a basic version of the product or service for free. The premium version of the product or service, having additional features, is available just upon payment.

- **Razor and blade**: The basic product is sold for free or at very little cost. The complementary product, needed to make use of the basic product, comes at a high price and accounts for the majority of company's revenues on that product or service.
## Definition of connected car applications

<table>
<thead>
<tr>
<th></th>
<th>Definition of Applications (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>In-Vehicle-Infotainment (IVI)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;It is the car’s built-in technology. Usually visible by the screen and the technology behind the screen&lt;br&gt;<strong>Example</strong>&lt;br&gt;QNX by Blackberry</td>
</tr>
<tr>
<td>2</td>
<td><strong>Smartphone Link</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;Smartphone and its apps are enhancing the driving experience and communicates with the vehicle.&lt;br&gt;<strong>Example</strong>&lt;br&gt;AppLink by Ford Motor Company</td>
</tr>
<tr>
<td>3</td>
<td><strong>OBD Device</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;A device, usually a “dongle”, is plugged into the OBD port and transfers valuable information to the driver.&lt;br&gt;<strong>Example</strong>&lt;br&gt;Automatic.com</td>
</tr>
<tr>
<td>4</td>
<td><strong>Remote API</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;Vehicle APIs can be used to remotely control and manage the car&lt;br&gt;<strong>Example</strong>&lt;br&gt;OnStar by GM</td>
</tr>
<tr>
<td>5</td>
<td><strong>Self-driving</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;Efforts that aim at developing a car that drives without human interaction.&lt;br&gt;<strong>Example</strong>&lt;br&gt;Stop&amp;Go by Mercedes-Benz (Daimler)</td>
</tr>
<tr>
<td>6</td>
<td><strong>Others and emerging initiatives</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Description</strong>&lt;br&gt;Projects that are not allocated within categories 1-5 or feature two or more of the previous five technologies.&lt;br&gt;<strong>Example</strong>&lt;br&gt;INRIX</td>
</tr>
</tbody>
</table>
Definition of connected car applications

Business models in the connected car industry

How?

1. List of OEM projects
2. List of non-OEM projects
3. Filter: 10,000+ applications

= Status quo of Business models @Connected car

6 CC categories
X
20 Business model patterns

1. In-Vehicle-Infotainment (IVI)
2. Smartphone Link
3. OBD Device
4. Remote API
5. Self-driving
6. Others and emerging initiatives
Definition of connected car applications

Examples of OEM applications
- Volkswagen SmileDrive
- Mercedes-Benz mbrace
- OnStar
- Uconnect

Examples of non-OEM applications
- Waze
- QNX
- CarMD
- GasBuddy
- dash

Business model patterns in Con. Car
Business model patterns in connected car
How will Business Models be innovated in the connected car industry in the light of the Internet of Things over the next 10 years?

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Company</th>
<th>Employees</th>
<th>Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1</td>
<td>CEO</td>
<td>Savari Networks</td>
<td>50</td>
<td>1.5 million USD</td>
</tr>
<tr>
<td>Interviewee 2</td>
<td>Automotive Software Developer, Entrepreneur</td>
<td>Mentor Graphics</td>
<td>4.400</td>
<td>1.09 billion USD</td>
</tr>
<tr>
<td>Interviewee 3</td>
<td>Director Business Development Europe</td>
<td>INRIX</td>
<td>350</td>
<td>N.A.</td>
</tr>
<tr>
<td>Interviewee 4</td>
<td>Director Smart Connected Vehicles</td>
<td>Cisco</td>
<td>75.000</td>
<td>47.142 billion USD</td>
</tr>
<tr>
<td>Interviewee 5</td>
<td>Product Marketing Manager</td>
<td>Novariant</td>
<td>50</td>
<td>10–25 million USD</td>
</tr>
<tr>
<td>Interviewee 6</td>
<td>Director of Innovation</td>
<td>Lixar</td>
<td>150</td>
<td>5 million USD</td>
</tr>
<tr>
<td>Interviewee 7</td>
<td>Executive Director</td>
<td>CARS (Center for Automotive Research at Stanford)</td>
<td>50</td>
<td>N.A.</td>
</tr>
<tr>
<td>Interviewee 8</td>
<td>Senior Vice President, Business Development</td>
<td>Streetline</td>
<td>50</td>
<td>N.A.</td>
</tr>
<tr>
<td>Interviewee 9</td>
<td>Head of User Experience at Global UConnect</td>
<td>FCA (Fiat Chrysler Automobiles)</td>
<td>225.000</td>
<td>86.816 billion USD</td>
</tr>
<tr>
<td>Interviewee 10</td>
<td>Senior Manager</td>
<td>Robert Bosch GmbH</td>
<td>280.000</td>
<td>46.1 billion USD</td>
</tr>
<tr>
<td>Interviewee 11</td>
<td>Business Analyst</td>
<td>Daimler</td>
<td>275.000</td>
<td>114.297 billion USD</td>
</tr>
<tr>
<td>Interviewee 12</td>
<td>Manager Innovation</td>
<td>Large German Automotive company</td>
<td>572.000</td>
<td>197 billion USD</td>
</tr>
<tr>
<td>Interviewee 13</td>
<td>Head of Global Business Development</td>
<td>QNX Blackberry</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>
“Basically, why the connected car? Because our customers and future customers even more will expect the car to be connected. The generation Y, that is expecting to travel, does not give for granted that they will travel by car. If you go back to 50s or 60s, a car was a must when you were talking about travelling. Generation Y is shifting: So if you imagine the generation Y becoming adults, so our next customers, you have one fourth of that population that would for example use car sharing, or using car rental, or use a train or bus.”
"There will be a moment where a supplier will offer mobility holistically, including the roads on which vehicles will be driving. That is already the case in public transportation, but in personal transportation not yet."

- Services are mainly aiming to make the customer **save time or money**
- The user experience will most likely be built around **safety and in car entertainment**
- **Data security** plays a big role in customer experience and is inherently linked also to driving safety.
“[...] It is always going to be a fight over the client. [...] I think that a model of cooperation is the most promising. For example a giant like Volkswagen and a large company like the Deutsche Bahn.”

- Supply chain innovation will most likely be happening in two different ways
- Firstly, the value chain of the car will be connected to other value chains.
- Secondly, the value chain related to private transport will be integrated in the value chain of the public transport.
"I as a customer, will be looking at a certain fleet and will be renting a vehicle on an hourly basis. That is a concept that will be coming for sure when we have the completely autonomous driving as well as mobility offerings. The customer will not buy the car anymore, but there will be a BMW bank or VW bank selling mobility services."

- From yearly leasing to **hourly leasing**
- **Flat-rate payments** would come in form of a mobility flat-rate
- **Bundling offerings** and adapting the target customer. One of the models is selling leads, or more specifically bringing the **customer to spend money at certain places**
“This is a long process with different layers. For humans we have a language and we have a deciphering process, but for machines there are so many layers associated with it. For every layer there is a different standard of authorization.”

“But to be there it is not only the technology in the vehicle but at the same time [...] you need the infrastructure, you need cities to be smart, you need the technology on the road. So it is not only a matter of the in-car technology, but it is very much about the complete change of the landscape [...]”

“I think it is not so much a problem of the standards. I don’t see a standard problem. I see more difficulties from a juridical point of view”
Thank you

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https://www.linkedin.com/pub/franz-tschimben/3b/ab8/933
## Business model patterns in Connected car

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<thead>
<tr>
<th>No.</th>
<th>BMP</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Add-on</td>
<td>The client uses a product or service at little cost. When the client makes use of the possibility to add additional features to the existing product or service offering the cost increases - often dramatically.</td>
</tr>
<tr>
<td>2</td>
<td>Flat rate</td>
<td>Client pays a flat rate and can therefore make unlimited use of the product or service.</td>
</tr>
<tr>
<td>3</td>
<td>Freemium</td>
<td>The client uses a basic version of the product or service for free. The premium version of the product or service, having additional features, is available just upon payment.</td>
</tr>
<tr>
<td>4</td>
<td>Hidden Revenue</td>
<td>The company does not make its major revenue from selling the product or service, but by commercializing it's surface.</td>
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<tr>
<td>5</td>
<td>Leverage Customer Data</td>
<td>The multiple use of customer data by a company.</td>
</tr>
<tr>
<td>6</td>
<td>Lock-in</td>
<td>The customer incurs switching costs when switching to another product or service. This switching costs are not necessarily of monetary nature, but can also refer to time or learning efforts that need to be undertaken in order to adapt to the new product or service.</td>
</tr>
<tr>
<td>7</td>
<td>Solution Provider</td>
<td>The company not only sells a product, but also a range of services that comes with the selling of the product.</td>
</tr>
<tr>
<td>8</td>
<td>Subscription</td>
<td>The client makes use of a product or service with a certain frequency. The length and frequency of use is regulated with a pre-sealed contract.</td>
</tr>
<tr>
<td>9</td>
<td>Sensor as a Service</td>
<td>Allows companies to monetize data gathered by means of multiple sensor network. It refers to the interpretation of data that allows for more accurate decision making.</td>
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</tbody>
</table>