Advanced driver assistance systems and telematics – the perspective of the Toyota captive

Peter Wandt
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Target: zero casualties
Role of the Toyota Captive
MS&AD – COMPANY PROFILE

- Located in Tokio und Nagoya
- Biggest insurer in Japan/Asia
- 60,000 employees
- Automotive core competence of AD
- MS core competence Business & Industry
- Strategic partnership with Toyota since 50 years
- Toyota Nr. 1 Shareholder since 40 years

Insurance rates based on own crashtests

Telematics Insurances

Branded Insurance Services
Toyota/Lexus/Daihatsu

(Japan Crash-Center)
Group Structure MS & AD / TOYOTA

MS & AD Holding Japan
Nr. 1 Japan & Asia Insurance Group

100%

Aioi Nissay Dowa Insurance Group Japan

100%

Mitsui Sumitomo Insurance Group Japan

100%

AND Insurance Automotive Organisation Japan

100%

General Insurer

Aioi Nissay Dowa Insurance Company of Europe
18 countries

100%

Life Insurer

Aioi Nissay Dowa Life Insurance of Europe AG

100%

BIG Telematics Group Ltd. (NEW)

75%

Toyota Motor Corp.
TMC Nr. 1 Worldwide

100%

Toyota Sales
Europe TME (48 countries)
US, Japan, Asia

100%

Global Asset Management Joint Venture
50%/50%

Toyota Financial services UK plc.

100%

Toyota Financial services
Japan

100%

Toyota R&D / Production
Europe, America,
Japan, Asia

100%

Toyota Kredit Bank
GmbH

SFC
(Local Sales Finance
Companies 14 countries)
STRUCTURE OF INSURANCE

MS & AD Holding Japan
Nr. 1 Japan & Asia

Mitsui Sumitomo
Insurance Group

MSI Europe Ltd Commercial
UK, Wales, Ireland, Scotland

MSI Europe AG Commercial
Germany, France, Netherlands, Italy, Spain, Belgium, East

Aioi Nissay Dowa
Insurance Group

ADE Europe Ltd. Automotive
Aioi Nissay Dowa Insurance Europe

MS & AD INSURANCE GROUP

MS & AD INSURANCE GROUP

UK, Germany, France, Italy, Spain, Belgium, Norway, Denmark, Finland, Sweden, Hungary, Portugal, Russia; Kazakhstan, Baltics, Turkey, Netherlands, Poland

Aioi Nissay Dowa
Insurance Group

Toyota Insurance Management Europe
TFS Joint Venture

Germany
Nr. 1 Operation in Europe

KFZ, AH Policen, RSV, GAP, Anschlussgarantie, RSA, ADMIN, Automotive support

BIG Telematics Group Ltd.

Insure the Box
Drive Like Girl
Tesco Box
And others

Aioi Nissay Dowa
Insurance Management Ltd.

Top Class Insurances
SRL Italy

Aioi Nissay Dowa
Life Europe AG

Mitsui Sumitomo
Insurance Group

MSI Europe Ltd Commercial
UK, Wales, Ireland, Scotland

MSI Europe AG Commercial
Germany, France, Netherlands, Italy, Spain, Belgium, East

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Aioi Nissay Dowa
Life Europe AG
First PAYD product in Japan
In combination with Toyota G-Book 2006

The PAYD page of a G-BOOK onboard terminal
New Insurance App PAY in connection with Toyota T-connect System (04/15)

App Example: Aioi Nissay Dowa Insurance

Insurance premiums can be linked to annual distance driven and calculated on a per-kilometer basis.
Development process Safety technologies: Claims data as starting point and verification of progress
Toyota Higashi Fuji Technical Centre
AIOI Insurance Auto Technical Research Center
Susono City, Japan
AIOI Insurance Auto Technical Research Center

The Aioi Insurance Automobile Research Center, Susono City, Shizuoka Prefecture
ANALYSIS RESULT: CLAIMS COST DISTRIBUTION

TIM data Evaluation Germany 2012/13
519 full comprehensive claim core models

42%  21%  20%  17%

RCAR Crash Test theoretical

54%  16%  0%  30%

Claims cost for windscreen replacement are about 13% of the total claims cost

Source: TIM DE
## ANALYSIS RESULT:

**AURIS, DISTRIBUTION OF CLAIMS COST**

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**Auris SB total 1242**

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<td>35.8%</td>
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<td>28.9%</td>
<td>18.3%</td>
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Source: TIM / Audatex
POSITIONING OF SENSORS AND CAMERAS

Damage cost:
Repair times/ -cost for windscreen or sensor replacement/ calibration
Potential for further accident reduction through driver assistance systems und telematics
3-dimensional Approach

Source: 2001 ITARDA Report
TOYOTA SAFETY DEVELOPMENT CONCEPT
Age distribution German customer portfolio
CONDITION AND ORIENTATION OF DRIVER

- Detect Face Width
- Detect Facial Feature Positions
- Calculate Face Center Point
- Determine Left/Right Face Direction Ratio

Detects top and bottom eyelids to calculate the aperture.
RECOGNITION
- COST-EFFICIENT SENSORS (e.g. LIDAR), SENSORFUSION;
- RECOGNITION, CLASSIFICATION AND VISUALISATION
360 DEGREE SURROUND VIEW WITH ALERT
REAR CROSS TRAFFIC ALERT
Exclusion of accidents by mixing up accelerator/ brake pedal
- Drive Start Control

1. Collision during backing

2. The driver shifts from R to D while erroneously stepping hurriedly on the accelerator pedal instead of the brake pedal.

3. Without control
   Sudden starts or acceleration

   With control
   Limits sudden starts or acceleration
TOYOTA/ LEXUS FUTURE DEVELOPMENTS
Transition from Driver Assistance to Intelligent Driver Support Systems
Fields of development in Driver Assistance systems/ Telematics

Next Generation Telematics

Intuitive connection technology

Next Generation Urban Traffic Systems

Urban social mobility

Intelligent Transport Systems

V2V and V2X communication

Energy Management

Home energy management
The combination of autonomous and cooperative safety systems will be the breakthrough
Potential for reduction of injuries and fatalities by technology
3D- Head-Up Display with navigation, object recognition and classification (type, prediction of direction and speed)
Reliable pedestrian recognition
Size, moving direction, speed)
Automatised braking and collision avoidance
Precrash System with pedestrian recognition and avoidance
Usage of information from navigation system / advanced map data
e.g. Navigation brake assist

1. Temporary Stop Notice

Around 100 meters prior to stop sign

2. Temporary Stop Alert

4 seconds prior to stop sign

3. Navigation-Brake Assist

Brake Assist is activated
Lane Trace control, cooperative adaptive cruise control, speed management
Toyota Big Data Traffic Information Service (since 2013)

T-Probe traffic information
ITS (Intelligent Transportation Systems) 
V2V and V2X communication
ITS helps to reduce accidents, improves traffic flow and reduces energy consumption and pollution
Intelligent mobility systems
e.g.: Ha:mo in Grenoble
Summary technology development:

- Telematics and Advanced Driver Assistance Systems (ADAS) are decisive for further reduction in number and severity of accidents
- Cost for sensors will come down significantly in short time
- Sensor fusion will improve recognition and judgement of situation
- Intelligent Driver Assistance Systems (ADAS) will use and submit data from all available sources in addition to the vehicle owned systems like GSM, WLAN, (3-D) Navigation, as well as data from other cars and infrastructure, to build real time scenarios
- Vehicles will be enabled to manage the majority of driving situations autonomously
- All vehicles will be part of intelligent and intermodal transport systems
- In dense agglomerations mobility services will take over the bigger part from privately owned cars, in less populated areas areas the need for individual, mobility, taking demographical issues into account, will strongly increase
- Toyota is currently not planning to launch fully automated vehicles
KEY AREAS FOR THE CAPTIVE TO FOCUS ON WITH REGARDS TO TELEMATICS

- User Based Insurance Solutions
- User based services (Data based up selling)
- Box solutions to support fleet deals, fleet insurances
- Safety and security services / Private e-call with insurance
- Anti Theft Solution/ tracking combined with UBS/UBI
- Customer profiling (…Google, Amazon, like ……)
- Prepare for Car sharing businesses, new mobility solutions
- Pricing, Underwriting, Screening – really different UW skills needed…..
- Data/ privacy protection
FUTURE URBAN MOBILITY?