Capital Market Days 2020
Strategic Action Field: Software and Systems Excellence
Our Strengths Overcome Software Challenges

Ticker: CON
ADR-Ticker: CTTAY

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Strategic Action Field: Software and Systems Excellence
Our Strengths Overcome Software Challenges

- Autonomous mobility
- Smart mobility
- User experience
- Safety

Software and systems excellence

Architecture and networking
Did You Know That …

… Continental performs
>250 software builds for existing customers/projects per day

… Continental has equipped 1,000,000,000+ cars with software

… Continental has had its own dedicated Software Academy since 2019
Software-defined Vehicles

… Face Numerous Challenges

Faulty software is **annoying**

Faulty software can be **fatal**

1 microprocessor
1 display
1 OS
7 sensors
0.174 kg
0 km/h

100 microcontrollers
4 displays
4 OS
hundreds of sensors
1,995 kg
250 km/h

1 Reference vehicle: German premium class vehicle in 2020
Software-defined Vehicles
... Face Numerous Challenges

Explosion of complexity
- Customer expectations and regulatory requirements
  - SW-defined differentiation

High degree of variants
- Regional requirements
- Numerous models per OEM
- Highly customizable models

Long product lifetimes
- Long-term maintenance period
  - Always up-to-date, safe and secure

Vague standards
- Generic industry standards
  - OEMs interpret standards individually

Safety
- Safety-critical mission
  - Defects can be life-threatening
Our Strengths Overcome Software Challenges
We Cover the Entire Spectrum of Customer Needs

60%
Non-differentiating software
› Common functionality required of all vehicles, regardless of brand, OEM, trim level, etc.
› Customer needs: Economies of scale for most competitive cost position

40%
Differentiating software
› Unique functionality for specific OEMs, models, regions, customer groups, etc.
› Customer needs: Economies of scope to provide best support/expertise

We cover 100%

Continental offers best-in-class software and systems excellence based on:

- Competence
- Technology
- Workflow
- Collaboration
Software Experts in Every Field
Continuously Improving with New Specialist Staff, Acquisitions and Training

Number of software and IT specialists

- 2015: > 22,000
- 2016: > 20,000
- 2019: > 20,000
- 2020E: > 19,000
- 2022E: > 17,000

Software-related acquisitions

- 2015: Elektrobit
- 2016: Zonar
- 2017: Argus cyber security

In-house Software Academy

Boost software expertise
- Effective on-boarding new hires
- Systematic up-skilling to new technologies
- Extensive cross-skilling non-software engineers on software topics

State-of-the-art learning
- +319% YoY completed learning items
- Agile: +100 training units added in 2020
- Artificial Intelligence: ~1,900 employees with knowledge in the area of AI by 2022
- Cyber security: 20k+ training units attended
- New formats: Hackathons, hands-on,...
Scalable, Integrated and Cloud-ready Platforms
We Deliver Software Stacks for Present and Future Architectures

Continental’s Technologies

Cloud

Differentiating software

Software functions

Continental
Function-specific development

OEM and domain
specific Middleware

Non-differentiating software

Operating system

HPC platform

1 Differentiating and non-differentiating software from an OEM point of view

Continental’s Technologies

Cyber Security Operations Center

Zonar
Fleet management

Elektrobit
Platform Services

Enables up to 30% savings in customer’s engineering costs

EB corbos
EB tresos
ARGUS
...
Scalable, Integrated and Cloud-ready Platforms
Our Products Fit into Today’s and Future E/E Architectures

Re-usable product architecture to deal with complexity and transition

We continuously enhance our platform products and increase the richness of functionality

Efficiency to deal with complexity

Re-usable platforms applied across numerous customer projects

Continental projects based on re-usable AUTOSAR modules

1 HW: Hardware, µC: Microcontroller, SW: Software, EB: Elektrobit, CES: Continental Engineering Services
**Speed and Agility**

We Have Efficient Software Development in Place

Fast and regular deliveries without compromising on quality

From projects ...

Classical project set-up with V-model

- set-up
- development
- validation
- release
- maintenance

6 months iteration

... to flow development

State-of-the-art flow development

- continuous dev/Int
- built-in quality
- release on demand

250 software builds per week for IIP\(^1\) project

70k tests executed/week

\(^1\) IIP: Integrated Interior Platform
Speed and Agility
We Manage the Complexity of Software Integration End2End

Solution to integrate an exponentially growing amount of software
Automatization and standardization
Reduction in development time and costs, increase in software quality
Collaborations Based on Trust
Software-defined Vehicles Require a New Collaboration Model

Hardware and function coupling – Software treated like hardware

- Traditional car
  - Tier1 >> OEM
    - Function development
    - Middleware
    - ECU integration
    - Hardware development
    - Hardware production
    - Spare part delivery, garage maintenance services
  - Tier2 >> Tier1
    - Middleware maintenance
  - Tier1
    - Function development stops at SOP\(^1\)

- IoT car
  - OEM
    - Function development
    - Middleware
    - ECU integration
    - Hardware development
    - Hardware production
    - Middleware adaption including security and safety support
    - Maintenance and lifetime security and safety support
    - New functions and services
    - Function development continues after SOP\(^1\)
  - SW supplier
    - Middleware adaption including security and safety support
  - HW supplier
    - Maintenance and lifetime security and safety support
  - SW supplier
    - New functions and services
    - Hardware production: Updates/changes possible
    - Spare part delivery, garage maintenance services
    - Hardware production
    - Middleware maintenance
    - EOP\(^2\)
    - EOL\(^3\)

1 SOP: Start of production, 2 EOP: End of production, 3 EOL: End of life
Collaborations Based on Trust
Our Strong Partnerships Within the Ecosystem

We unite the right partners for building software-defined cars.

Note: Any rights of trademark owners remain unaffected
Software and Systems Excellence

Summary

First supplier in the automotive industry to enable software-defined vehicles (Volkswagen ID.3)

We cover 100% of customers’ software needs, from non-differentiating to differentiating software

We have a strong software team, continuously growing with new specialist staff, acquisitions and training

Our technologies and workflows enable efficient and agile development of full software stacks

Proven collaboration model that brings together OEMs, hardware and software suppliers, and services providers
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