ENGINEERING EFFICIENCY IN AUTOSAR IMPLEMENTATION

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Aptiv Active Safety and User Experience
12 Years of Experience
- Engineering Leadership
- Product Management
- Agile Methodologies
- Automotive & Manufacturing
Aptiv Today

POSITIONED TO WIN

2018 FINANCIAL PERFORMANCE

$ billions, except per share amounts

- **$22.0** BOOKINGS
- **$14.4** REVENUE
- **$1.8** OPERATING INCOME1
- **$5.26** EARNINGS PER SHARE1
- **$1.4** ENGINEERING INVESTMENT

1. Adjusted for restructuring and other special items’

GLOBAL FOOTPRINT AND CAPABILITIES

Aptiv is a global technology leader, with more than 160,000 people across more than 125 manufacturing facilities and 15 major technical centers worldwide. With a presence in 44 countries, we address mobility’s toughest challenges through our deep software and systems integration expertise, delivering market relevant solutions for our customers.

- Technical Centers (15)
- Manufacturing Sites (126)

18,600 ENGINEERS

6,500 SOFTWARE ENGINEERS
5 Steps

Step 1: Why AUTOSAR?

Step 2: What is AUTOSAR?

Step 3: HOW? Planning AUTOSAR Implementation

Step 4: Development, Integration & Testing

Step 5: Production Ready Safety SW
Why? - AUTOSAR Trend

- non AUTOSAR
- AUTOSAR Classic


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Why? - Benefits

• Global Standard
• HW & SW Dependency reduction
• Reuse of Software
• Standardized Interfaces
• Efficient Variant Handling
• Time to Market
• Platform based Engineering
• Technology Together
AUTOSAR AIMS TO STANDARDIZE THE SOFTWARE ARCHITECTURE OF ELECTRONIC CONTROL UNITS (ECUS). AUTOSAR PAVES THE WAY FOR INNOVATIVE ELECTRONIC SYSTEMS THAT FURTHER IMPROVE PERFORMANCE, SAFETY AND ENVIRONMENTAL FRIENDLINESS.

What?

Application SW
RTE
BSW & O/S
MCALs
Microcontroller
How? - Planning

- AUTOSAR Specifications
- AUTOSAR BSW Development
- AUTOSAR Configuration and Integration
- Micro Controller needs
  - MCAL readiness (Micro Controller Abstraction Layer)
  - Compatibility of MCALs
  - Functional Safety Levels (A, B, C or D)
  - Memory needed
  - MCALs licensing
- Tool Chain (AUTOSAR usage)
  - Tool to develop AUTOSAR compliant application
  - Tool to Configure and generate Code for BSW
  - Licensing model for the Tool chain
- Complexity of migration from Legacy SW.
How? - Planning

AUTOSAR BSW Development – Core Partner
- Delivery timing
- Licensing Models
- Training Supported
- Standard Solutions offered
- Customized Solutions timeline
- Customer Specific Expertise

AUTOSAR Configuration and Integration – Consulting Partner
- Knowledge base on the AUTOSAR package
- Expertise on Architecture
- Expertise on Toolset
- Expertise on the End-Product

AUTOSAR – Implementing Org
- Timely Distribution of customer requirements
- Functional Safety Concept
- Development Methodology (Agile, Iterations)
- Issue tracking methods
- Communication methods
- Hardware selection and availability
- External Interface requirements
- Overall Systems Testing
Milestone 1

Milestone 2

Milestone 3

Milestone 4
UNDERSTANDING THE ITERATIVE APPROACH

How?

BETA1

BETA2

Production

Autosar SW Package

Config & Integ

Updated Package

Bug Fixes

Testing
Communication Channels

Number of Channels = n(n-1)/2

3 people, 3 channels
6 people, 15 channels