

# WELCOME

## MODEL BASED SOFTWARE - IMPLEMENTED QUICKLY AND EASILY

**Martin Zappe**

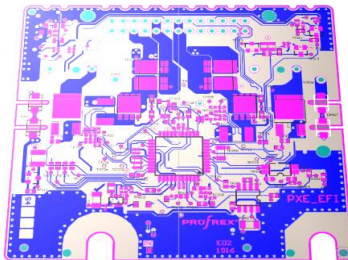
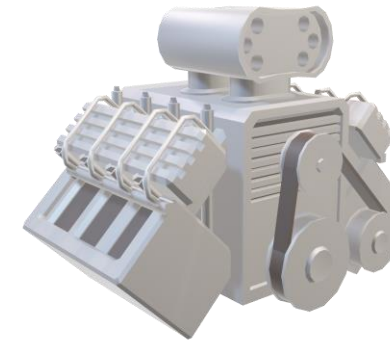
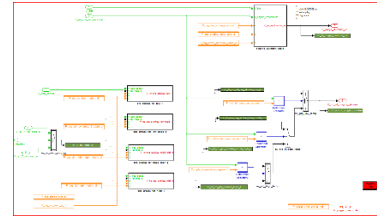
Director Sales Division



# Agenda

- #1 The future of Motor Management System
- #2 Ensure competitiveness of Motor Management System
- #3 Easy implementation of Model Based Software
- #4 Questions and Answers

# Daily Challenges



```

563 //
564 // IOWM_TRE_ID_START
565 //
566 // // WUNDERLICH: 07.11.11 Ba
567 // IOWM_TRE_ID_THRESHOLD_DEFINE_BIT :
568 // 1000, /* Delta time 1000-1000 us ca. 2000 IOWM */
569 // 20, /* Change IOWM angle */
570 // 1000, /* time to threshold */
571 // 700, /* increasing speed delay */
572 // 700, /* decreasing speed delay */
573 // 700, /* first speed delay */
574 //
575 //
576 //
577 // IOWM_TRE_ID_START
578 //
579 // // WUNDERLICH: 07.11.11 Ba
580 // IOWM_TRE_ID_THRESHOLD_DEFINE_BIT :
581 // 1000, /* Delta time 1000-1000 us ca. 2000 IOWM */
582 // 20, /* Change IOWM angle */
583 // 1000, /* time to threshold */
584 // 700, /* increasing speed delay */
585 //

```

“MY SUPPLIER WILL CONTINUE TO  
DELIVER MY MOTOR MANAGEMENT  
SYSTEM IN THE FUTURE!”

ARE YOU SURE?



# The future is electric

## Market strategies are changing

### Our Path to an All-Electric Future

Zero Crashes, Zero Emissions, Zero Congestion

RESEARCH

### The Future Is Electric

In the past few years, the auto industry's transformation has accelerated around the world. J.P. Morgan Global Research explores the global electric vehicle market, the key developments driving its progress and expectations for the future.



### Why the Automotive Future is Electric

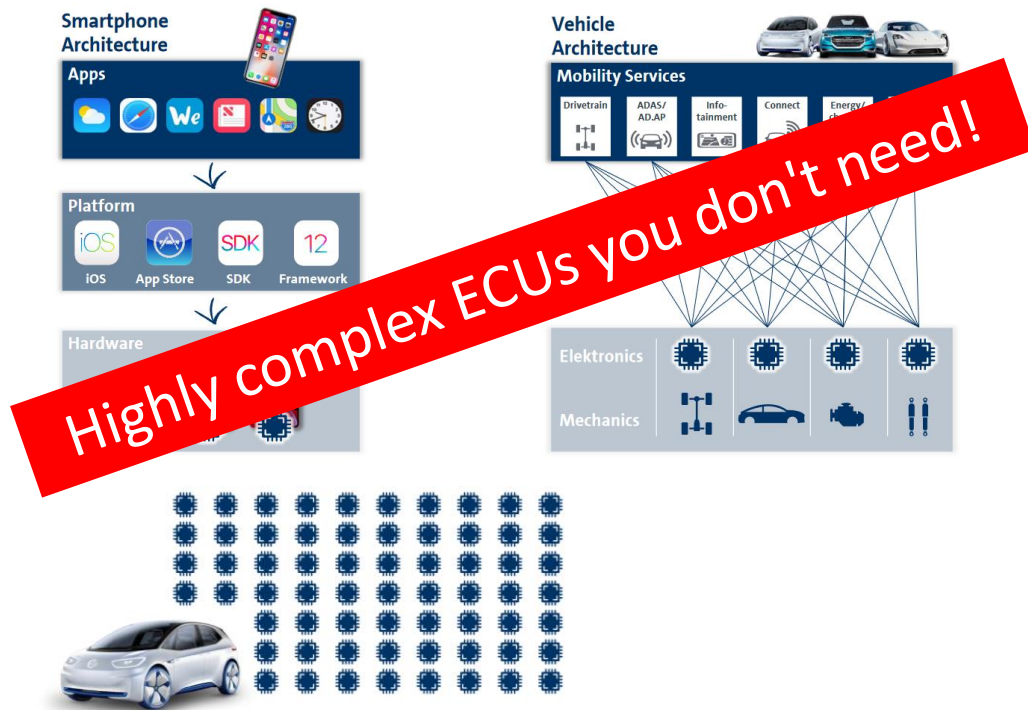
NOVEMBER 23, 2022 BY MARK ALLINSON — [LEAVE A COMMENT](#)

- The focus is clearly on an electric future
  - Both for strategic reasons and
  - due to engineering capacity
- Traditional ECU Suppliers will probably not support combustion engines in the future

## Where does that leave you?



# Will you get the flexibility for your customer-specific requirements?



- 70 ECU's per car
- Numerous connections between ECUs and SW applications

~~Dependency on partners~~

Competitiveness

# “MY MOTOR MANAGEMENT SYSTEM IS COMPETITIVE!”

## ARE YOU SURE?



# You don't get the support for your control units you need!

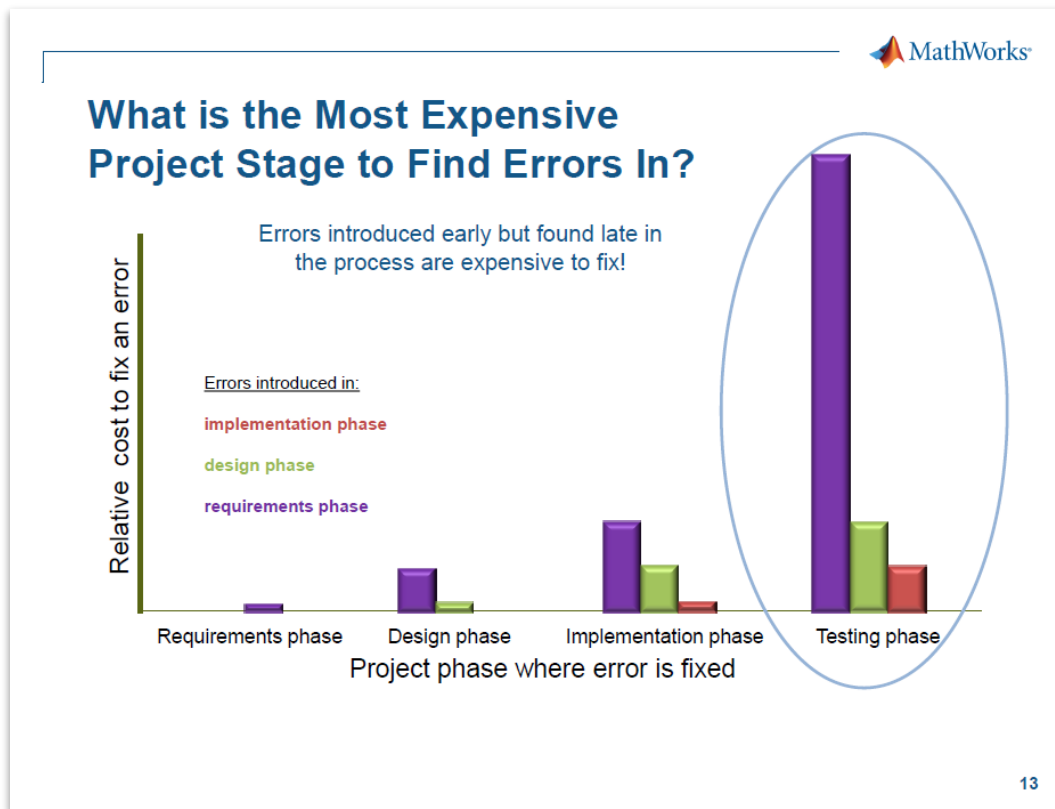


- Redesign phases are complex and unpredictable
- ECU's are often automotive-specific and not flexible
- Development and test cycles are expensive



# Development and test cycles are expensive

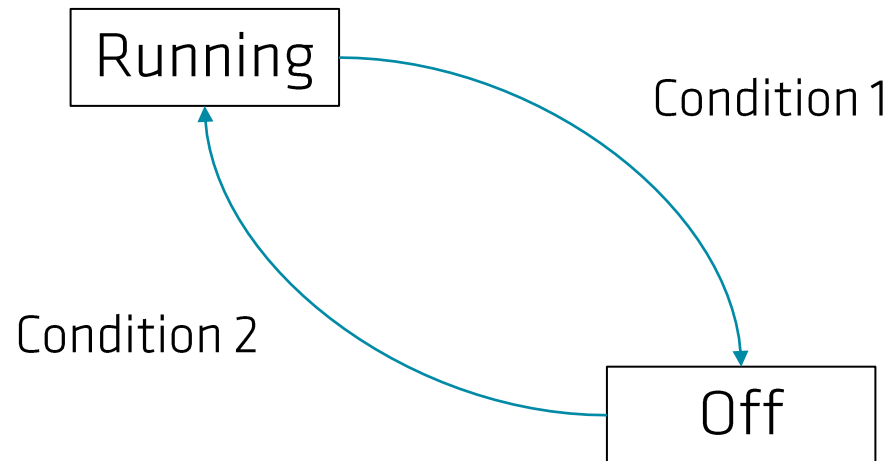
## Software Development Process



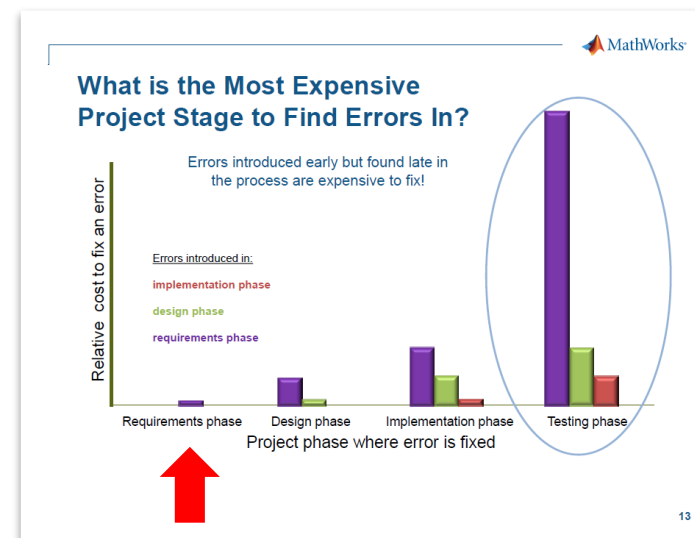
- Reason for high costs within projects?
- Finding an early made mistake in a late stage!

Reference: The MathWorks

# Simulation is key Software Development Process



- Simulation offers results before test phase
- Quality is independent of the risk "human"
- No knowledge and no technology is lost



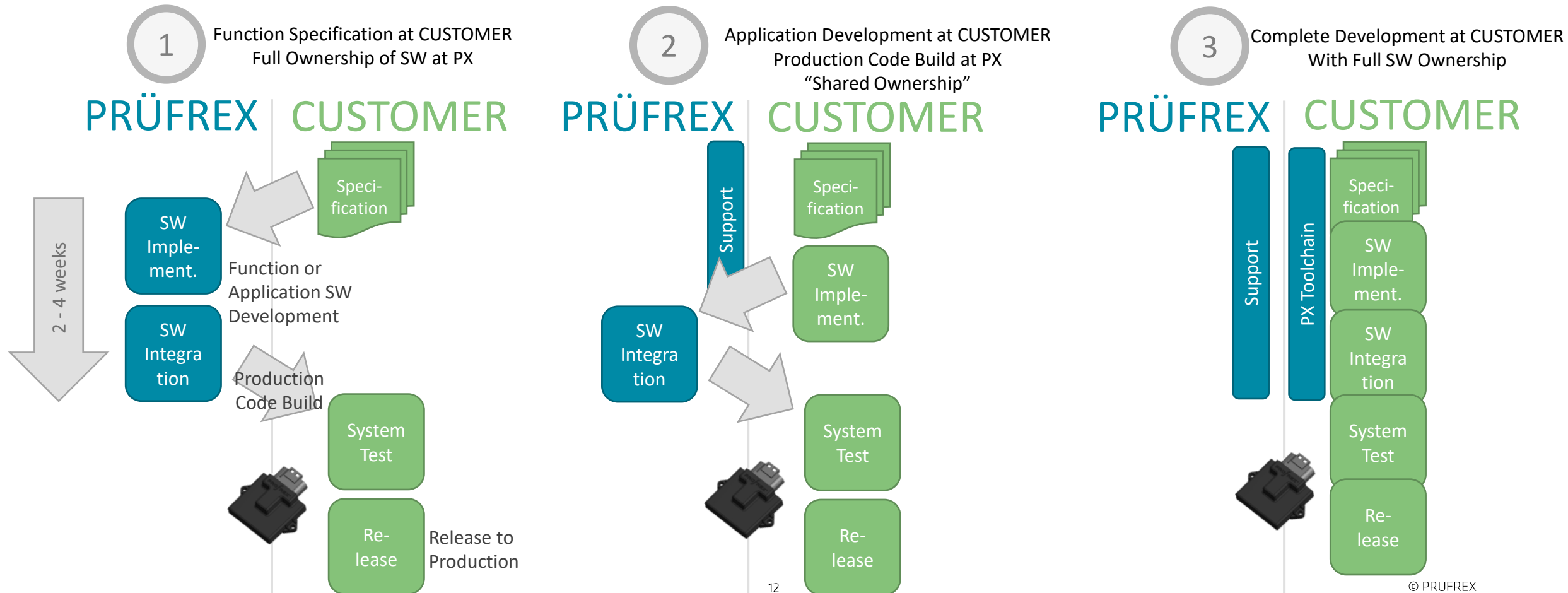
# “MODEL BASED DEVELOPMENT IS COMPLICATED IN PRACTICE!”

## ARE YOU SURE?



# Different approaches of function development

## ... what does CUSTOMER prefer?



# Model Based Development For Easy Handling Software Development Process



- Time-saving
- Cost-saving
- Requirements for software knowledge reduced
- Process risk minimized



# Your Partner for Motor Management Systems

- ECU suppliers clearly repositioning to focus on E-Mobility Market
- Software will play a major role in engine applications in the future.....
- PRUFREX has got a long-term committed to Combustion Engines Motor Management Systems
- Direct support by PRUFREX Engineering Team



# QUESTIONS?

# NEW DRIVE FOR YOUR BUSINESS

Contact us



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