SPLC 2023
27th Systems and Software Product Line Conference
TOKYO

MARQUARDT

INDUSTRY CHALLENGES


Gabriela K. Michelon


Karsten A. M. Guenther

Who is Marquardt?

- Creative mechatronics expert, founded in 1925
  22 locations and 11,000 employees

Operating Components (HMI)

Battery Management

Drive Authorization Systems

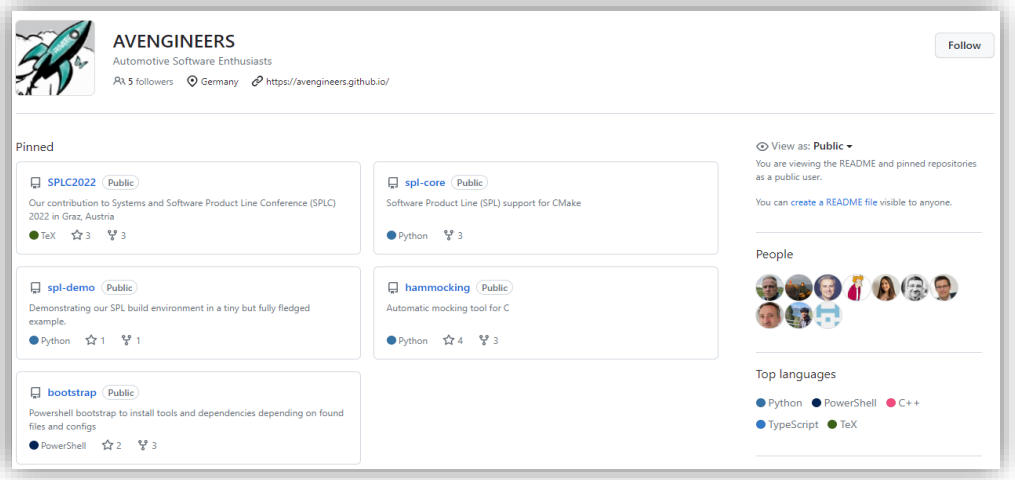
Lighting

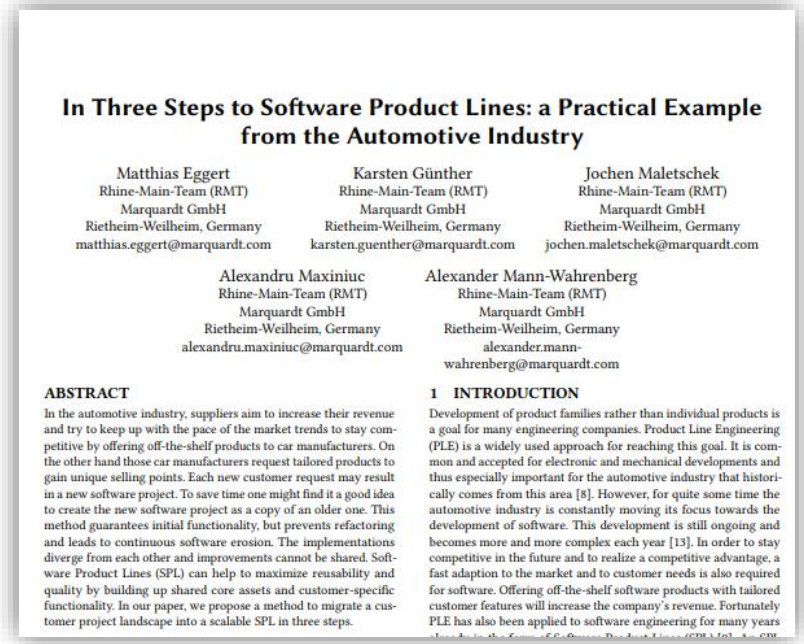
Pumps

Switches and Sensors

Who are we?

- Rhine-Main Team (RMT)
- Located in Sulzbach, Germany (Rhine-Main area)
- Working on
  - System/Software Engineering
  - Software Product Line Engineering
  - Open Source Contributions





In Three Steps to Software Product Lines: a Practical Example from the Automotive Industry

Matthias Eggert
Rhine-Main-Team (RMT)
Marquardt GmbH
Rietheim-Weilheim, Germany
matthias.eggert@marquardt.com

Karsten Günther
Rhine-Main-Team (RMT)
Marquardt GmbH
Rietheim-Weilheim, Germany
karsten.guenther@marquardt.com

Jochen Maletschek
Rhine-Main-Team (RMT)
Marquardt GmbH
Rietheim-Weilheim, Germany
jochen.maletschek@marquardt.com

Alexandru Maxiniuc
Rhine-Main-Team (RMT)
Marquardt GmbH
Rietheim-Weilheim, Germany
alexandru.maxiniuc@marquardt.com

Alexander Mann-Wahrenberg
Rhine-Main-Team (RMT)
Marquardt GmbH
Rietheim-Weilheim, Germany
alexander.mann-wahrenberg@marquardt.com

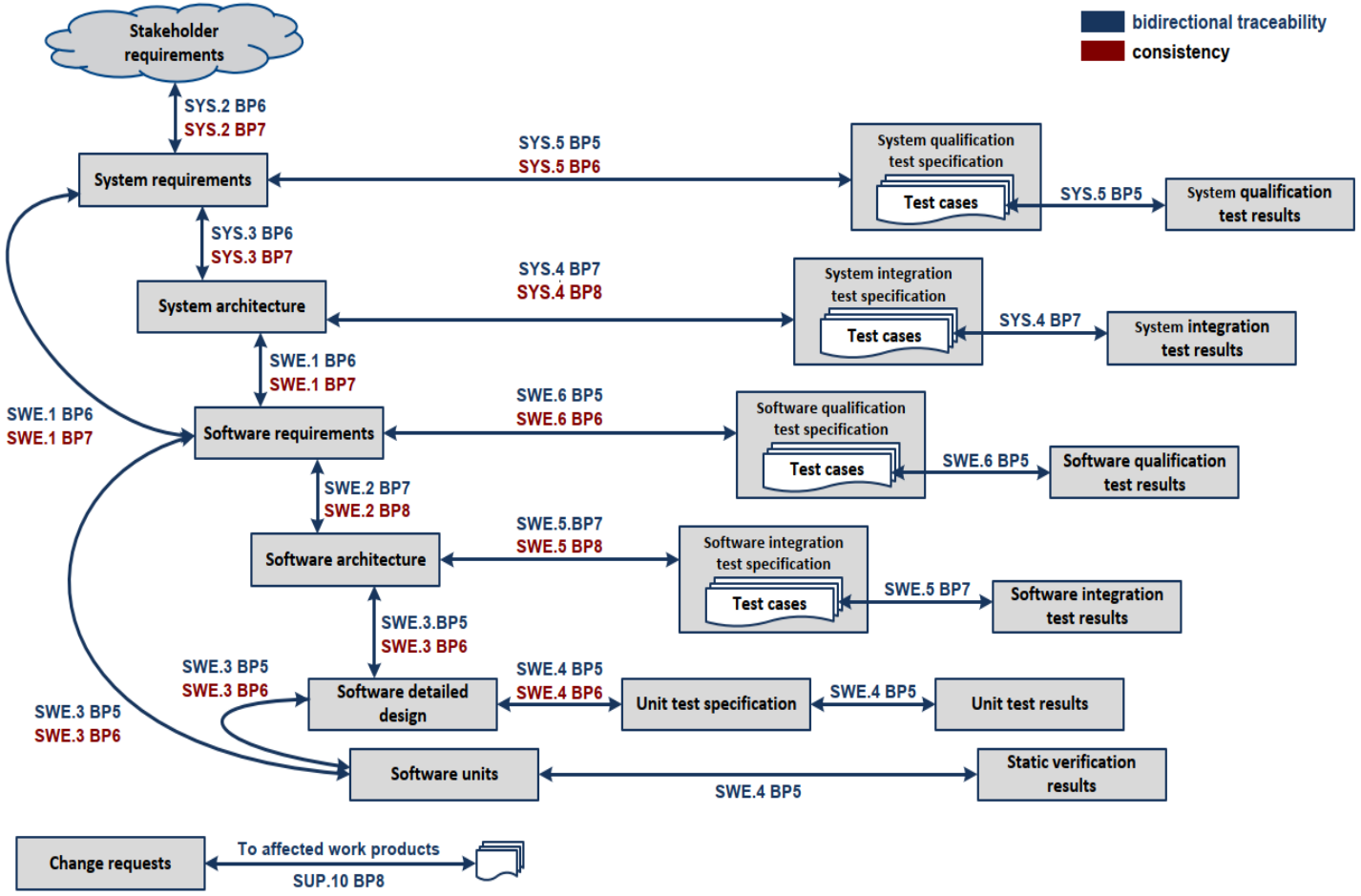
ABSTRACT

In the automotive industry, suppliers aim to increase their revenue and try to keep up with the pace of the market trends to stay competitive by offering off-the-shelf products to car manufacturers. On the other hand those car manufacturers request tailored products to gain unique selling points. Each new customer request may result in a new software project. To save time one might find it a good idea to create the new software project as a copy of an older one. This method guarantees initial functionality, but prevents refactoring and leads to continuous software erosion. The implementations diverge from each other and improvements cannot be shared. Software Product Lines (SPL) can help to maximize reusability and quality by building up shared core assets and customer-specific functionality. In our paper, we propose a method to migrate a customer project landscape into a scalable SPL in three steps.

1 INTRODUCTION

Development of product families rather than individual products is a goal for many engineering companies. Product Line Engineering (PLE) is a widely used approach for reaching this goal. It is common and accepted for electronic and mechanical developments and thus especially important for the automotive industry that historically comes from this area [8]. However, for quite some time the automotive industry is constantly moving its focus towards the development of software. This development is still ongoing and becomes more and more complex each year [13]. In order to stay competitive in the future and to realize a competitive advantage, a fast adaption to the market and to customer needs is also required for software. Offering off-the-shelf software products with tailored customer features will increase the company's revenue. Fortunately PLE has also been applied to software engineering for many years

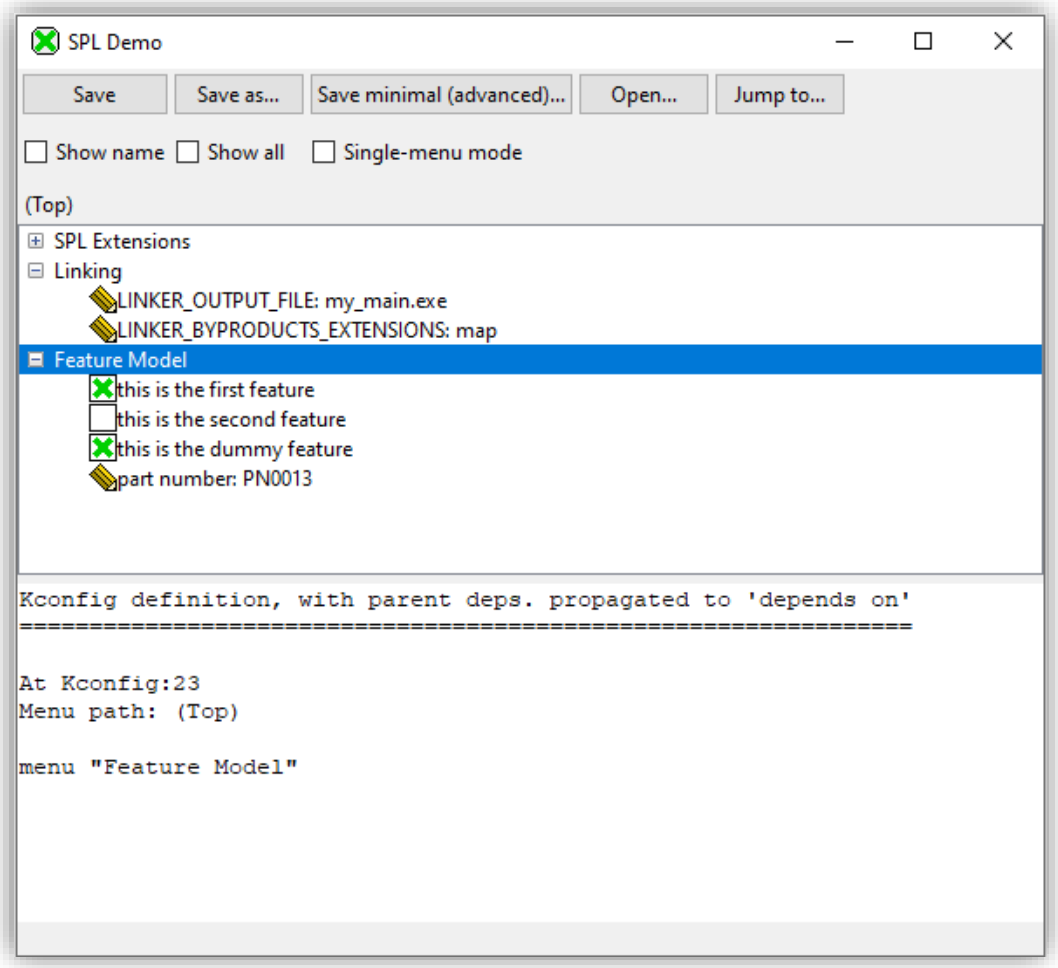
Automotive SPICE



Challenge: How to handle variability in all required work products?

Feature Configuration with Kconfig

- Usability
- Overview of features
- Configuration of features



Challenge: Is Kconfig the right tool for feature configuration in an SPL?

Continuous Integration and Delivery (CI/CD)

- Fast feedback
- Quality gates
- Developer/customer/project acceptance

Challenge: How could a test strategy for an SPL look like?

Challenge: Changing the Organization

Contact

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