

Michael Lang

Design of a Portfolio Management System for Software Line Development

Merging the Gap between Software Project and Product Management



Anchor Academic Publishing

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Lang, Michael: Design of a Portfolio Management System for Software Line Development: Merging the Gap between Software Project and Product Management. Hamburg, Anchor Academic Publishing 2015

Buch-ISBN: 978-3-95489-218-1

PDF-eBook-ISBN: 978-3-95489-718-6

Druck/Herstellung: Anchor Academic Publishing, Hamburg, 2015

Bibliografische Information der Deutschen Nationalbibliothek:

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

Bibliographical Information of the German National Library:

The German National Library lists this publication in the German National Bibliography. Detailed bibliographic data can be found at: <http://dnb.d-nb.de>

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Hermannstal 119k, 22119 Hamburg
<http://www.diplomica-verlag.de>, Hamburg 2015
Printed in Germany

Abstract

Tracy (1995, p. 19) emphasises in his book that in the twenty-first century, tomorrow will be more different from today than in the past. Therefore today's corporations get to stay innovative, reinvent themselves continuously and have to design new business. In contrast to that, software mastery becomes more than ever the key factor for business success (Northrop, 2008, p. 12). In the twenty-first century, software pervades every sector and has become the bottom line for many organisations.

Therefore, reusability plays a growing role for every business in today's rapid changing world (Strahringer, 2003, p. 5). Thus, new paradigms in software engineering are focusing on the reutilisation and modularisation of software solutions. One innovative and growing concept since 2003 is software line development which has its origin in the automotive and fashion industry (Strahringer, 2003, p. 5). The key benefits of software line development is the covering of a wide field of application with minimal extra costs by reuse of a common software platform. In reference to Ebert & Smouts (2003, p. 29) the most publications in the field of software lines deal with configuration and change management. Whereas the integration of software line development into enterprises' product portfolios has been till now widely neglected. In contrast to that Jeffery & Leliveld (2004) points out that the failure or success of software lines highly depend in particular on their level of integration into companies' product portfolio system.

For this reason, the major goal of this research is the realisation of an integrated portfolio management system for software line development. This covers at first the determination of the role portfolio management in organisational governance. Thereafter the general elements of a portfolio management system will be identified. On the other side, the specific demands of software line engineering according to the portfolio elements will be analysed. The insights of the analysis build the basis for the design of the software product line portfolio management system. The design describes the portfolio management system from different architectural perspectives which represent the viewpoint of the diverse stakeholders. Moreover, different analysis methods will be evaluated with a respective scoring model for the software line product, domain and asset application domain. At the end, the scientific work gives a suggestion for further investigations in the scope of software line portfolio management.

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List of Abbreviations

bn	<u>b</u> illion
C2	<u>C</u> ommand and <u>C</u> ontrol
CEO	<u>C</u> hief <u>E</u> xecutive of <u>O</u> fficer
EADS	<u>E</u> uropean <u>A</u> eronautic <u>D</u> efence and <u>S</u> pace Company
ECV	<u>E</u> xpected <u>C</u> ommercial <u>V</u> alue
EPC	<u>E</u> vent-driven <u>P</u> rocess <u>C</u> hain
FEF	<u>F</u> amily <u>E</u> valuation <u>F</u> ramework
GmbH	<u>G</u> emeinschaft <u>m</u> it <u>b</u> eschränkter <i>Haftung</i>
IT	<u>I</u> nformation <u>T</u> echnology
NPV	<u>N</u> et <u>P</u> resent <u>V</u> alue
OGC	<u>O</u> ffice of <u>G</u> overnment <u>C</u> ommerce
P3O	<u>P</u> ortfolio, <u>P</u> rogram and <u>P</u> roject <u>O</u> ffice
PMI	<u>P</u> roject <u>M</u> anagement <u>I</u> nstitute
PM	<u>P</u> roject <u>M</u> anagement
R&D	<u>R</u> esearch & <u>D</u> evelopment
ROI	<u>R</u> eturn <u>O</u> n <u>I</u> nvestment
SBU	<u>S</u> trategic <u>B</u> usiness <u>U</u> nit
SEI	<u>S</u> oftware <u>E</u> ngineering <u>I</u> nstitute
UML	<u>U</u> nified <u>M</u> odeling <u>L</u> anguage

Chapter 1

Introduction

"In the twenty-first century,

Tomorrow will be more different from today than in the past. Continuing innovation and improvement are essential for survival. "

(Brian Tracy, 1995, p. 19)

The author Tracy (1995, p. 19) emphasises in his book the challenges companies will face in the twenty-first century. In order to survive in a globalised business world of relentless change and enduring competition, companies have to come up with more than only new ideas. According to Hamel (2012, p. 41), enterprises have to consider that their present state of success will be probably not of a long lasting nature.

Examples of today's rapidly changing markets are the diverse stories of *Apple* and *Nokia*. Apple computers, which lacked of innovation and a marketing strategy in 1996, is since 2011 the most valuable company of the world with about 600 billion US dollars market value (BBC, 2012). In contrast to that, Nokia the former market leader in mobile sector has forgotten how to deliver innovation fast enough to its clients (Elop, 2011).

Thus, *IDEO* President and CEO, Tim Brown (2005) stated that companies who fail to excel at new products have very little chance of survival. Therefore today's corporations get to stay innovative, reinvent themselves continuously and have to design new business. In contrast to that, software mastery becomes more than ever the key factor for business success (Northrop, 2008, p. 12). In the twenty-first century, software pervades every sector and has become the bottom line for many organisations.

Therefore, reusability plays a growing role for every business in today's rapid changing world (Strahringer, 2003, p. 5). In the future, only the companies will stay competitive which can deliver customizable software solutions for an acceptable price in a proper time. For this reason companies have to transform their previous project focus into a product centred business strategy (Ebert & Smouts, 2003, p. 28). Thus, new paradigms in software engineering are focusing on the reutilisation and modularisation of software solutions.