

Collaborative and cross-company project
management within the automotive industry
using the Balanced Scorecard

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Thesis submitted for the degree of
Doctor of Philosophy

University of Technology, Sydney
2009

Abstract

Cross-company product development projects are often managed without clearly defined project goals and without an alignment of these goals to an organisations strategy and objectives. With a shift towards more decentralised and distributed development teams, and an increasing level of collaboration, project transparency is reduced and status measurement more difficult due to a lack of transparency. To overcome these difficulties, the quality of collaboration in the automotive manufacturing industry needs to be improved. The understanding of unifying goals and of the mutual purpose to produce new products is essential for efficient and effective collaboration.

A methodological study in the automotive industry as part of this research lead to the conclusion that a strategic scorecard method based on the Balanced Scorecard concept by Kaplan and Norton is capable to improve cross-company project management and reduce existing difficulties in typical product development collaboration, such as communication or collaborative risk management. A common definition of project goals, leading and lagging indicators to measure the status, and defining corrective action are core elements of the Collaborative Project Scorecard concept.

This thesis identifies the current problems and difficulties in automotive project management and explores solutions to improve its efficiency and effectiveness based on the Collaborative Project Scorecard. It is shown how the concept is derived from business strategies for an improved alignment of project goals with business objectives. A project impact analysis facilitates the development of project strategy maps to increase transparency of goal impact interdependencies. Furthermore, based on the results of workshops, surveys, and interviews the Collaborative Project Scorecard concept is applied to typical automotive product development projects and the identified advantages and limitations are evaluated by an application to a cross-company project of an automotive supplier and a manufacturer. The development of the Collaborative Project Scorecard is followed by a software implementation of the results. The integration of a collaborative project management model that has a focus on time, task and communication management enables the project manager to create operational indicators that can be controlled on a strategic level by the Collaborative Project Scorecard. Additionally, it is shown how risk management and performance

assessment are supported by the concept. Advantages, benefits, and limitations of the methodology are identified and further application scenarios suggested.

CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Preface

The automotive industry has undergone great structural changes in the last years. An increasing number of project partners that are required for the development and manufacturing of a vehicle has also changed the way automotive projects are managed. The industry requires adapted methods to improve performance of cross-company and collaborative projects and to reduce product recalls and project failures. This research was dedicated to find a new path for the future by designing a concept that can be adapted to a wide range of projects and organisational requirements. As the concept has been developed within this research project its evaluation is limited to chosen project types and to selected areas of project management. The fundamental structure of the Collaborative Project Scorecard allows an organisation and project partnership to adopt the concept in various ways ranging from simple stand alone solutions in pilot projects to a complete integration to project portfolio and business management. The concept alone is no guarantee for success and improvement as it depends on a careful consideration of several aspects. Some of them are related to the organisation itself and its management structure and project types, others to the selection of relevant objectives and correspondent measures. While project management experience and skills cannot be replaced by a method, a framework such as part of the Collaborative Project Scorecard can support beginners and experts to focus on the relevant goal achievements by linking operational tasks to an overall strategy.

Acknowledgement

During the last three years of my research project I have met many inspiring people who understood the challenges of a PhD and supported me with their innovative ideas and help in various different ways. A network of research partners and friends was created that will hopefully sustain and grow stronger. Research is not possible without other people, their guidance, advice, and motivation to understand your goals and objectives. My special thanks go to David Eager, my principle supervisor and research partner over those three years. David supported me in any possible aspect with strong dedication, patience, and humour. He made my time as a research student enjoyable and fascinating by opening doors to new experiences in my life. I am also thankful to Bruce Moulton, my alternate supervisor at UTS, who helped me to commence my PhD at UTS from the very beginning and who always had the right advice how to improve my work.

A number of coincidences brought me to another great person, Klaus Kubitzka, who was the chairman of the ProSTEP iViP Collaborative Project Management project in Germany. Klaus made it possible to continue my research with the BMW Group in Germany and the USA. He was also highly dedicated to create the necessary environment within the organisation that allowed me to carry out my research without any boundaries. His continuous care and great understanding for my research needs were indispensable for the success of this project. My gratefulness goes to him and to the whole BMW Group in Germany, the department of processes, methods, and tools for product projects in particular, and the BMW Group in the U.S., where I always found open minds and cooperativeness to answer my questions and great curiosity to participate in workshops and interviews. At this time I also want to mention Joachim Taiber, head of the IT Research Centre in South Carolina, and the workshop and interview team from plant 10. Without them the contributions to the research project in South Carolina could not have been achieved. My special thanks go to Maximilian Kissel, my Master student at that time, who has greatly contributed to the concept development and workshops in South Carolina. He made our concept discussions very productive and his creativity influenced the quality of this research. He was also an essential team member to implement the CPS concept together with Microsoft and supported me with his work as a research partner and friend. In this context I would like to thank the project partners from Dräxlmaier USA and Juergen Frank in particular.

Without their co-operation some of the methods and tools could not have been evaluated.

The research has continuously been carried out in a wide network of research partners. Major contributions were developed thanks to the support of Reinhard Wagner, chairman of the Automotive Chapter of the German Project Management Association. Reinhard gave me the opportunity to organise relevant chapter workshops to develop the concept and he also supported me in publishing and presenting major parts of the research activities. He was also a driving force that initiated the idea of the Collaborative Project Scorecard. Hence, my thanks go to the members of the GPM e.V. Automotive Chapter who participated in the two major workshops.

In addition, I would like to express my thankfulness to the contribution of the postgraduate students of the course Managing Projects at UTS who I supervised for their final assignment from 2006 to 2008 and the administrative support of Phyllis Agius from the Faculty of Engineering and IT. Finally, I also want to thank my family and my friends for their understanding and helpfulness during these sometimes eventful times.

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Nomenclature

AIAG	Automotive Industry Action Group
AIPM	Australian Institute of Project Management
APA	American Planning Association
APM	Agile Project Management
APQP	Advanced Product Quality Planning
ARC	Appraisal Requirements for CMMI
AS	Active Sum
ASAM	Association for Standardization of Automation and Measuring Systems
BMW	Bayerische Motorenwerke
BSC	Balanced Scorecard
C3PM	Cross-Company-Collaboration Project Management
CCPM	Critical Chain Project Management
CCTA	Central Computer and Telecommunications Agency
CMMI	Capability Maturity Model Integration
CPIM	Collaborative Project Impact Matrix
CPM	Critical Path Method & Collaborative Project Management
CPS	Collaborative Project Scorecard
CPSM	Collaborative Project Strategy Map
DFA	Design for Assembly
DFM	Design for Manufacturing
DIN	Deutsches Institut fuer Normung
DMU	Digital Mock Up
EDM	Engineering Data Management
EFQM	European Foundation for Quality Management
GM	General Motors
GPM	German Project Management Association
IAO	(Fraunhofer)
IPMA	International Project Management Association
IRNOP	The International Research Network on Organizing by Projects
ISO	International Organisation for Standardization
IT	Information Technology
JIS	Just in Sequence
JIT	Just in Time

KGI	Key Goal Indicator
KI	Key Indicator
KPI	Key Performance Indicator
LOB	Line of Balance
MbO	Managing by Objectives
MbP	Managing by Policy
MOST	Mission, Objectives, Strategies, and Tactics
NGO	Non-governmental Organisation
OEM	Original Equipment Manufacturer
OGC	Office of Government Commerce
OSM	Office of Strategy Management
PA	Process Area
PDM	Product Data Management & Precedence Diagram Method
PDP	Product Development Process
PE	Project Excellence
PERT	Program Evaluation and Review Technique
PMBok	Project Management Book of Knowledge
PMI	Project Management Institute
PMO	Project Management Office
PS	Passive Sum
PSC	Project Scorecard
QDX	Quality Data Exchange
QFD	Quality Function Deployment
ROCE	Return on Capital Employed
ROI	Return on Investment
SCS	Strategic Collaboration Scorecard
SE	Simultaneous Engineering
SIG	Special Interest Group
SPICE	Software Process Improvement and Capability Determination
SPSC	Strategic Partnership Scorecard
SPSM	Strategic Project Strategy Map
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TQM	Total Quality Management
VDA	Verband der Automobilindustrie
WBS	Work Breakdown Structure

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