



Proceedings of the **9TH INTERNATIONAL DSM CONFERENCE**

Munich
16 - 18 October 2007

Eds.:
Udo Lindemann
Mike Danilovic
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Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche
Nationalbibliografie; detailed bibliographic data are available in the Internet at
<http://dnb.d-nb.de>.

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Printed in Germany.

ISBN 978-3-8322-6641-7

ISSN 0945-0874

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen

Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9

Internet: www.shaker.de • e-mail: info@shaker.de

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FOREWORD

CAPITALIZE ON COMPLEXITY

The core of all business is to generate capital and survive. The challenge for managers is to sustain corporate performance in the long run. Pioneering leaders who sought to create enduring institutions have become the stuff of business legend. Scholars have tried to explain what makes strong performance endure. Managers still find it hard to shift their attention from today's stock price, next set of interim results and corporate prosperity. So what is characterizing an enduring and healthy corporation? In a recent McKinsey Quarterly paper, based on 800 research publications, and 60,000 responses to a survey at hundreds of companies over the past five years, were presented. A healthy corporation is characterized by its ability to:

- Be resilient and manage uncertainties and adaptation to changing environment, technological changes, market variation, and risks
- Execution of good decisions – wherein good decisions rely on good execution and good execution relies on employees who have knowledge and are aware and understand what is decided, how they are expected to fulfill their roles and that they take full responsibilities
- Organizational alignment, synchronization of actions and cohesiveness of purpose among all people, managers and employees towards a common goal, particularly in scattered, physical and organizational disaggregated corporations
- Strategic management strategic and organizational renewal, the ability to generate new business ideas and adapt to change, both culturally and strategically
- Complementarities that rest on effective communication and collaboration: Effective information flow is crucial to ensure that assets, processes, relationships, and management practices act in concert; information flow across hierarchical levels, departments and units, tapping into social networks beyond the formal organizational structure

Companies all over the world are facing new challenges. Globalization has opened up new markets, competition has increased, and technological changes can be seen as either an opportunity or a threat. New technology is enabling new functions and features to be introduced in products and combinations of mechanical systems, electronics and software solutions forces corporations to develop new capabilities to work in global and integrated settings, far more in the future than in the past. Global companies operate on the global as well as on the local arena with local and global supplier footprints and customers with shifting demands. In a number of situations new suppliers are becoming technological leaders. New business opportunities are here for those companies that understand how to cope with changes and develop new products and organizational solutions. Those that are not will see themselves out of business.

To be capable of capitalizing on complexity corporations and management must find new approaches to manage increasing uncertainties deriving from accelerating complexity, and they must manage people in basic organizational settings and in many different simultaneously running projects with global suppliers. This means above all an integrated multi-project context, i.e. how to handle technology in terms of modularization of product architecture and how to handle process design in order to enable high level of coordination and synchronization across organizational entities and people.

The core issue in managing complexity is to uncover interdependencies and understand the flow of information within and between elements of complex systems. Information is the glue in a complex system. Managing information is the key issue for healthy corporations in the future. Only those companies that recognize and fully understand consequences of increased complexity can be in a

position to capitalize on complexity and continue to be healthy. There is big money out there for those companies that are capable of understanding how to efficiently organize people in global organizational settings, product architecture and design processes in efficient way that take into account information flow.

For many years researchers and practitioners have worked on new approaches and solutions. Initially, the Design or Dependence Structure Matrix (DSM) was introduced to handle interdependencies and information flow between elements in single domains. Later, the Domain Mapping Matrix (DMM) was introduced to enable analysis of interdependencies between elements across domains. As complementary tools, DSM and DMM can support managers and practitioners with valuable tools to understand how components in product architecture, people in organizations, and their actions are linked with each other. A systematic use of DSM and DMM can support managers in their decision making, and employees in corporations to become healthy by focusing on the flow of information. This focus on the flow of information enables people to handle uncertainties and risks as they become exposed, to take responsibilities as they understand who needs information from whom, about what, when and why, and communication is improved and actions are synchronized among managers and employees. Managing information flows is the key issue for managing healthy and profitable corporations in the future. Nowadays, we are facing an increasing number of software packages and solutions that can support managers and employees in using DSM and DMM approaches. Now we can support practitioners with methods, approaches, software solutions, experience and knowledge. What we need from practitioners is reflections, empirical experiences, more empirical data and new joint research projects to continue this endeavor in research and knowledge development for mutual benefits. The increased complexity in the future leads to new and unknown uncertainties to be managed. This situation requires new knowledge to be developed. Together we can do it!

It is our privilege to have been in this research field for many years and we have followed the knowledge development and understanding of how complex systems work and how we can handle the uncertainties deriving from complexity. This conference started as a meeting place for researchers in the DSM and DMM community. Now we have created an arena, a melting pot, where researchers, practitioners, consultants and software providers can meet and exchange experiences and knowledge for mutual benefits and for the future of corporations. In a sense, we have the same goal, to support development of healthy corporations that are capable of managing uncertainties, in order to capitalize on complexity. We hope that this conference can put light on new areas of mutual interest and those practitioners from industry and scholars can find new areas for collaboration for mutual benefits.



Udo Lindemann



Mike Danilovic

FOREWORD

BMW IN THE FACE OF COMPLEXITY

With complexity being one of the most important topics nowadays, the BMW Group is happy to be host to this year's 9th International DSM Conference and to bring together research and practice under the roof of the "Four Cylinder".

The issue of complexity has evolved notably over the past years – from evading it to managing it. Yet, the focus of capitalizing on complexity has more and more made the scene, promoting and using complexity as an inherent advantage over the competitors and driver towards customer satisfaction. This holds true for the BMW Group, facing reduced cycle times in development, a growing variety of products offered on the market and sharpening requirements concerning comfort, safety and environment.

With regard to these demands, it is all the more important to manage the complexity that is caused thereby while securing the flexibility of the solutions and ensuring a continuously high innovativeness of the company.

Much of this is provided by highly networked products that are more and more confronted with the issue of integration already in the early phases of development. Approaches used by the BMW Group are, for example, function orientation, i.e. structuring the product architecture and the underlying processes from the perspective of the products functionalities; furthermore, systems' thinking takes place from the very beginning onwards to ensure total car integration at the end of the development process; ultimately, modules and comprehensive architectures enable the common look and feel of a BMW while allowing the re-use of components.

Aggravated by such constraints derived from commonalities or economies of scale, efficient management of these "ingredients to complexity" becomes more and more important. In fact, simple handling is not sufficient but there is a growing need to be highly efficient in order to be precompetitive. This means that the network consisting of products, the company's processes and overall organization and the market needs to be understood in all of its mutual relationships and configured accordingly.

The evolution of the Design Structure Matrix has shown its potential in being able to support engineers, managers and researchers when accepting these challenges. It is, therefore, my pleasure to be host to this year's DSM conference.



Hans Rathgeber