A FRAMEWORK TO UNDERSTAND PROJECT ROBUSTNESS

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A multitude of projects fail the forecasts regarding costs, duration and customer requirements. Following the problem of deviations will be addressed with the focus on SMEs in the domain of mechanical engineering. Numerous methods and approaches are offered to improve this situation, but these approaches are basically reactive. This means actions will not be implemented until the project is already in a precarious situation. The concept of project robustness aims for proactive solutions. In this paper a framework will be developed to understand robustness in the context of product development projects. Based on this different generic approaches to enhance project robustness will be presented and discussed.

CURRENT INDUSTRIAL PRACTICES FOR RE-USE OF MANUFACTURING EXPERIENCE IN A MULTIDISCIPLINARY DESIGN PERSPECTIVE

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To a large extent, experiences gained during manufacturing, does not appear to have enough impact on new generation products in manufacturing industry. The inherent difficulties may be explained by the multi disciplinary character of the problem together with the fact that experiences are not used in the same context as where these are captured. In an empirical survey within two manufacturing companies, feedback and re-use mechanisms are studied amongst personnel from manufacturing operations, manufacturing engineering and design engineering. Results indicate that whether or not formal processes for experience management, work methods in multi-disciplinary teams and IT systems support exist or not, the effectiveness is not as high as desired.

ENABLING FACTORS FOR MANAGING INTELLECTUAL RESOURCES IN ENGINEERING DESIGN

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Using intellectual resources available, to produce long-term competitive advantage in engineering design, requires evolution in the ways strategies are executed. This means linking effective knowledge management methods to business strategies, and strategies to operations. Intellectual resources management should not consider only individual or organizational factors, but the forms of social coalitions between these two resources. The goal of this paper is to apply existing knowledge management models with the experience of the authors, to recognize enabling factors for managing intellectual resources in engineering design. Models discuss the form, time, place and context in which the information and knowledge is shared and exploited.

INNOVATION HUBS: WHY DO THESE INNOVATION SUPERSTARS OFTEN DIE YOUNG?

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'Radical innovation' poses many new challenges for an organisation and requires new competencies, some of which may conflict with existing best practices for incremental innovations. 'Innovation hubs' are a type of organisational structure dedicated to radical innovation projects that have been used by companies to manage these conflicts. This paper reports on a study of six innovation hubs that attempts to discover why some have failed whilst others have flourished. Conclusions are drawn on what management practices are most conducive to a successful innovation hub; and how greater value could be derived by the mainstream organisation through the cross-fertilisation of ideas, knowledge and culture.

POST-MERGER PRODUCT DEVELOPMENT INTEGRATION: A CASE STUDY

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Combining different companies through mergers or acquisitions (M&A) is a common management strategy nowadays. For companies whose major business activity is focused on product development, the complexity of design processes adds another dimension to the already existing challenges of a post-merger integration (PMI). The purpose of this contribution is to discuss this impact, focusing on the question how to achieve a successful transformation of design organizations. The described case study shows that harmonizing the product development processes of different organizations needs to take the following steps: a) analyzing the “as-is”, b) defining the “to-be” and c) ensuring the successful transition from a) to b).

NETWORK ENABLED CAPABILITY AS A CHALLENGE FOR DESIGN: A CHANGE MANAGEMENT VIEW

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In 2002 the UK Ministry of Defence introduced Network Enabled Capability (NEC) as its response to US designs for Network Centric Warfare. NEC as a paradigm poses a number of requirements on systems in the battlefield and defence companies are expected to deliver systems that meet these requirements. Requirements such as agility or interoperability can be achieved by improved change planning. At the same time, the effects of change can be unpredictable. Scoping the effects of change before a change is made can be crucial for delivering products or services in time and in budget. This paper investigates how operational requirements of NEC impact industry tasked with designing network enabled products from a change perspective.

TOWARDS AN INTEGRATION OF SIX SIGMA, DESIGN FOR SIX SIGMA AND DESIGN METHODOLOGY

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The selection and interpretation of methods and workflow within the product development process are not synchronous and practice usually varies between the departments involved (e.g. development and production). This complicates the utilization of company potential. The integration of the different practices could increase corporate understanding, work-content consistency and generate synergy benefits. The paper examines the possibilities and benefits of a consolidation of up to now detached approaches for problem solving, such as Design Methodology (DM), Six Sigma and Design for Six Sigma (DFSS) and describes a possible first approach to an interdisciplinary consolidation of viewpoints and presently applied approaches, bearing the entire product development process in mind, beyond the classical boundaries of production and design.

A COMPETENCE MANAGEMENT METHODOLOGY FOR VIRTUAL TEAMS - A SYSTEMIC APPORACH TO SUPPORT INNOVATION PROCESSES IN SME'S

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The changing nature of teams in a context of raising importance of innovation has brought on a need to identify the competencies that are necessary to work effectively in a virtual team environment. Our paper defines key elements and identifies interrelations between different concepts of virtual teams, competences management and innovation processes. Due to the systemic approach of the functional analysis our paper offers a holistic overview of a methodology of competence management to create competitive virtual teams for supporting innovation processes in Small and Medium-sized Enterprises. The generic nature of our proposed approach makes it applicable in any industrial fields.

A FRAMEWORK TO CLASSIFY PROCESS IMPROVEMENT PROJECTS

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While process improvement projects have varying parameters (e.g. goals, timeline, etc.), there is a basic structure to planning such projects. Yet, there are few planning aids, and transferring the institutional knowledge from one project to the next one is difficult. The project classification framework proposed here aims at assisting project planners, who are faced with the task to organize a process improvement project, to categorize their projects according to the optimization goal, the process granularity and the project novelty in order to show them if relevant knowledge is available, and to assist them during the selection of appropriate activities to achieve the general goal and of adequate methods to perform these activities.

OPPORTUNITIES AND BARRIERS IN THE DEVELOPMENT OF SUSTAINABLE PACKAGING FOR THE AUSTRALIAN FOOD INDUSTRY

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For more than three decades packaging has been considered as principal user of material resources, as well as a waste generator. The Australian packaging industry is particularly concerned about how to address these environmental issues. This paper presents a study consisting of a series of interviews with people involved in the packaging development process of some leading food and beverage packaging companies. The study comprises an assessment of the development processes currently undertaken by companies, as well as the ways in which they incorporate sustainability into it. We include a description of the different roles in this process, as well as recommendations for good practices to consider sustainability in a more efficient way.

CO-DESIGNING BROAD SCOPE OF TECHNOLOGY-BASED APPLICATIONS IN AN EXPLORATORY PARTNERSHIP

Gillier T., Piat G. - *Minatec Ideas Laboratory* (*FRA*) 927

A relatively new type of innovation partnership is emerging : exploratory partnership. This partnership concerns the identification and exploration of innovation fields from emerging technologies. Generally, these partnerships concern few partners (2 or 3) on similar or complementary business. In MINATEC IDEAs Laboratory®, 6 industrial partners have decided to explore the potential of micro-nanotechnologies for their 6 different business. In order to manage efficiently this partnership, we have experimented a method, the D4 method, which is both a creativity technology-oriented tool for designing innovative concepts and a mean to evolve from "community based co-operation" to a more reduced development cooperation (3 partners max).

IMPACTS OF DESIGN PROCESS CHARACTERISTICS ON THE SELECTION OF PLM ARCHITECTURES

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This paper discusses the correlation between characteristics of the design process and the determination of PLM architectures. Based on first results from ongoing research activities with industrial partners, a process-oriented approach to the determination of PLM architectures is presented. This approach helps to analyze processes - especially design processes - and to develop - based on the results of this analysis - suitable PLM architectures. Future work will focus mainly on a transfer of the concept to a more abstract process level and on the formalization of the presented approach.

FROM WORKFLOW SPECIFICATION TO IMPLEMENTATION: AN INDUSTRIAL USE CASE

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In the domain of project management, PLM offers functionalities for enabling process definition and execution through the use of Workflow Management Systems (WMS). This paper presents the implementation of workflow module in a PLM application. We highlight the limits of workflow in a context of product development and the necessary difference between the processes identified and the workflow implemented. The research context, the workflow specification and the analysis of the results are presented. The specification is set using interviews and a process reference model is developed to enable the communication between the users and the IT-Support. The analysis describes the benefits of existing WMS in a context of product development.

FACTORS INFLUENCING THE VULNERABILITY OF MANUFACTURERS TO PRODUCT IMITATIONS

Petermann M., Meiwald T., Lindemann U. - *Technical University Munich* (*DEU*) 979

This paper describes the first step in a research project visioning towards an approach of “know-how protective product design“. Companies threatened or affected by product imitations increasingly dispose of technical measures against product imitation, supporting common measures of jurisdiction like patents and brands. Technical measures are possible in the fields of product design, manufacturing processes, logistics, and IT security. The effectiveness of such measures has not been investigated yet and shall be clarified in later steps of this research. In this paper, factors and possible values for these factors are identified that influence the vulnerability of technical goods developers and manufacturers to imitation of their products.