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Engineering change management report 2011: Survey results on causes and effects, current practice, problems, and strategies in Denmark

Changes or modifications have always been a fundamental part of product- and service design, yet they are often costly and potentially decrease overall development efficiency and effectiveness. How Danish manufacturing firms are able to improve engineering change management practice is a decisive factor for the country’s future productivity and growth. To achieve this, universities and industry need to work together. Results of this study present a first step towards devising solution strategies and identifying further research needs.

This report presents results from a survey on current practice, challenges, and strategies for improved engineering change management of more than 90 engineering firms from different industry sectors and sizes in Denmark. In particular, the report presents an overview of current practice of engineering change management in Denmark, shows the extent to which engineering changes affect all parts of an organisation and the value-chain, and explores the difference between average and critical changes. The survey was conducted in August 2011 by members of Danmarks Tekniske Universitet (DTU) and the Technische Universität München (TUM).

Results show that engineering changes consume almost one third of the total R&D capacity and one third of all changes are critical changes that endanger overall project success. Critical changes have a high affiliation to change propagation both in terms of what causes them and in their effects. Insufficient clarification of requirements and human error in process execution are the main causes for engineering changes. Major initiators of engineering changes are customers, end-users and market trends and the R&D Department, with the main objectives of reducing deficiencies of the product and to integrate new innovative solutions and technologies. Effects on products and people are evaluated as surprisingly positive, in the sense that changes can also be regarded as an opportunity, while process and cost effects show mainly negative associations.

Companies surveyed emphasise informal and face-to-face communication during engineering change implementation, with software use in comparison being surprisingly low. The biggest problems listed range from engineering change process support to internal and external communication and the need for company-internal awareness and competence training for better engineering change management. The biggest need for appropriate strategies is seen in supporting early phases of engineering change management, for example, for early detection, risk-assessment, and avoidance of unnecessary changes.

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