

DECISION MAKING IN DESIGN TEAMS: ANALYSIS OF USED AND REJECTED DECISIONS

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Nowadays, the majority of designers work as part of a team. During product development designers have to make countless decisions. Design decisions have a tremendous impact on the quality of the design solution, costs and on the company's success on the market. This study analyses decisions that impacted the final outcome against those that were not pursued further revealed a major influence on how designers configured the solution space within rejected decisions. In an experimental study a cognitive coding system has been developed which assessed so-called design decision components. The analysis of decisions can be seen as a promising approach to analyse the contribution of the individual to the decision making process in design teams.

EVALUATION OF THE POTENTIAL PERFORMANCE OF INNOVATIVE CONCEPTS IN THE EARLY STAGES OF THE NEW PRODUCT DEVELOPMENT PROCESS (NPDP)

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Innovation is incontestably one of the big responsible of companies' growth and a crucial element for competitiveness. It is proven that without a precise procedure, structured and based on defined criteria, the possibility of making an unsuccessful evaluation of the innovative ideas increases considerably. In this paper we present a first approach of an evaluation method that aims to support the early stage in the NPDP, particularly the ideas selection. Considering the importance of these decisions and their consequences, the use of an effective methodology is justified. The selection method suggested by our research is able to change the evaluation subjectivity, by formalizing the procedure and fixing precise criteria.

METHOD OF DESIGN EVALUATION FOCUSED ON RELATIONS OF MEANINGS FOR A SUCCESSFUL DESIGN

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This research proposes a methodology of analysis of design factors, based on meanings. The originally described factors of meanings are based on the idea for summarizing and representing relations between meanings. The analysis of results of a survey of design factors was used to evaluate the influence of introduced factors of meanings on the design evaluation. The resulting model clearly shows the effect of the proposed WordNet-based factors of meanings on the evaluation of design. Understanding the role of meanings in design assessment factors is a step in the development of a meaning-based support method of designing. This methodology of analysis bridges the gap to supportable process of synthesis of meanings in design methodology.

DEPENDENCIES IN CONCEPT DECISIONS IN COMPLEX PRODUCT DEVELOPMENT

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The paper presents results from a retrospective case study in the automotive industry with the purpose to identify dependencies in product concept decisions taking into consideration social aspects, decision structures and technology. Interviews and document reviews, such as gate reports and design reviews, formed the empirical base. The company in question has a documented and mandatory product development process with defined instructions, process maps and a basic chain of command. In spite of the operational support, the company still suffers from a certain amount of rework based on incorrect concept decisions. Results from the empirical study show how both formal and informal factors did affect the concept decision in the studied case.

EVALUATION AND RE-DESIGN METHOD OF MANUFACTURING PROCESSES

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To establish sustainable manufacturing, it is necessary to evaluate manufacturing quality. We have proposed a new product efficiency indicator; total performance indicator (TPI). In this paper, we try to apply TPI to manufacturing processes. By calculating TPI of each segment process, bottleneck segment process can be clarified. This paper takes ceramic diesel particulate filter as an example. The method quantifies the contribution of each segment process in creating the product value. A segment process which doesn't contribute much to create value and have large environmental impact, should be improved. By the approach, a designer can evaluate and redesign environmentally benign manufacturing processes.

DECISION AIDING TOOLS IN PRODUCT DEVELOPMENT: A CASE STUDYMontagna F., Vittone R. - *Politecnico di Torino (ITA)*

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The elements of complexity and uncertainty present in the process of New Product Development (NPD) require a comprehensive approach to deal with a problem that involves people, technology and organization. An effective approach should integrate tools that facilitate communication on organizational knowledge and collective problem structuring with others that can analytically study and simulate the process activities that characterize the work context and support the decisions of the NPD process. The paper presents the results of a research that started from an observation of the phenomena involved in the NPD process and the application of this approach in a intervention for the NPD management in a Franco-Italian aerospace company.

SUPPORTING DECISION MAKING WITH AGENT BASED MODELLING AND SIMULATIONNergard H., Johansson C., Larsson T. - *Lulea University of Technology (SWE)*

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The presented paper discusses using an agent based modelling and simulation approach to create dynamic models of actual product development activities. The modelled activities are created with the purpose to realise a decision support tool used in a Functional Product Development scenario. The decision support tool is called a Total Offer Readiness Level (TORL) and is used to assess whether the product development process is mature enough to be used in the development of a Total Offer providing only the function to the end user. The area of application and an example implementation has been developed and is shown with the purpose to highlight opportunities.