

REDESIGN OF ORGANIZATIONS AS A BASIS FOR ORGANIZATIONAL CHANGE (EXTENDED ABSTRACT)

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1. Introduction

To smoothen processes in society, often specific forms of organization are used. Organizations usually have goals to be achieved or maintained that serve as requirements for their functioning. They are created according to certain organizational structures which define elements or parts of the organization and how these are connected. The idea is that for these elements and parts certain behaviors occur that interact with each other so that the resulting overall organization behavior fulfills its goals. As goals may depend on the environment of the organization, which often is dynamic, goals can change over time. To adapt to such changes in requirements, often the organization has to change as well. This re-organization problem, to find a changed organization form that fulfills the new requirements, can be considered a redesign problem. Such a problem is described in the form of three elements: (1) an available design object description (for the organization as it is); (2) a specification of a set of design requirements (behavioral properties for the organization) used to design and satisfied by this design object, and (3) a specification of a set of new design requirements to be fulfilled by the new design object. The solution to be found is a new design object description as a modification of the existing one and possibly a specification of a changed set of new design requirements.

To formalize such a redesign process, formalizations are needed of design objects, design requirements, and of the dynamics of redesign processes. In this paper AGR (Ferber and Gutknecht 1998) is used as a formalization for design objects which specifies such an object at different

aggregation levels (i.e. the organization, groups, and roles). For the specification of design requirements, dynamic expressions are formulated in TTL specifying requirements at the different aggregation levels of the design object (Jonker and Treur 2002). Via hierarchies requirements at different levels are related to each other. In order to enable the specification of the dynamics of the redesign process, the same approach for specification of requirements at different aggregation levels has been used.

2. Case Study

In order to evaluate the functioning of the proposed formal approach, a case study has been performed based on Womack *et al.* (1991). The case study concerns an automobile manufacturer which has an existing organizational design and is placed in a competitive environment. A hierarchy of requirements is specified for the organizational design of the automobile manufacturer. On the highest level in the hierarchy the goal of the organization as a whole is specified, namely to maintain sufficient demand for the cars produced. This is obtained in case the costs of the organization are low enough and the market as a whole is not going down. The cost factor can again be related to lower levels in the organization. Furthermore, a change hierarchy is specified drawing inspiration from Womack *et al.* (1991) which expresses a hierarchy of requirements on the change process to be performed in case the design object requirements are not fully satisfied. On the highest level the requirement posed for the change process states that demand is restored, which can be established by means of lowering the cost. In turn, lowering the cost can be obtained by either lowering the design cost, the production cost or the quality repair cost, or a combination of the three. Lowering of the cost for one or more of these can again be obtained via several methods. Using the SMV model checker (McMillan, 1993) it is shown that using the two hierarchies sufficient demand is maintained despite changes in the environment in the form of competitors lowering their cost.

References

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