

**Dissertation title:**

**Cost and time efficient change of production systems - balanced resilience change management**

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Nowadays success of production systems not only depends on the efficiency of routine processes, but also on the efficiency of change processes related to new technological processes, business models and network configurations. Overall, production systems in practice have undergone fundamental changes in recent years. Decentralized production networks (such as industrial parks, global production networks and virtual factories) are increasingly replacing traditional forms of hierarchic industrial organizations. Production systems are no longer following a model of interlinked and centrally controlled production units, but rather the principles of decentralized network organizations.

The aim of this thesis is to develop an innovative approach to facilitate a cost and time efficient transformation of production networks. For that reason two different change management approaches have been developed. The reactive approach represents specific interventions which aim to cope with certain identified demands for transformations in production networks. The proactive change management focuses on the installation of generic change-friendly infrastructures for self-organized change processes by the network members. A hybrid change management approach is designed that facilitates a cost and time efficient change of production systems. The hybrid concept primarily represents a configuration management of heterogeneous design tools of the reactive and proactive change management approaches.

Against the background of high complexity of transformation processes and insufficient knowledge of success factors in change management the thesis follows a pragmatic and eclectic research approach. Instead of precise algorithms, the exploratory research approach focuses on practical heuristics. The innovative balanced resilience performance concept serves as a framework for the evaluation and selection of change management tools to facilitate efficient transformation processes of production networks. With regard to significant fixed costs, which are associated with the proactive installation and maintenance of change management infrastructures, three heterogeneous strategies of fixed cost management are examined. The transformation and relocation of fixed costs as well as an investment in high-performance change infrastructures foster an optimization of overall change costs.

To evaluate and verify the developed change management approach in practice an empirical analysis is carried out. Due to their great importance in production practice, change programs for the realization of a hybrid-digital factory were selected for the empirical verification. The empirical results show that the hybrid change management concept is a suitable framework for a performance-oriented transformation of

production systems. It facilitates a cost and time efficient change of production networks.