University of Medicine, Pharmacy, Sciences and Technology of Târgu Mureş

Doctoral School

Abstract of the PhD thesis

Process and Product Change Management and the Impact Analysis of Performance Increase

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Background: The engineering creates products, services, and technical systems to meet the needs of modern society, so the scope is to implement some methods for optimization and improvement the process of engineering change requests and the implementation of changes results. The presented thesys present the change management study for two companies from Romania through an applied research in the automotive domain.

Objective: The objective of the presented PhD thesis is to present the specific process for implementation of engineering change requests in production process and improve the quality of the products or the processes.

Methodology: The presented thesis is divided in seven chapters, each one presenting the main subject of the paper. The first chapter presents the overview of specialty literature about product or process change management, history, and evolution. The second chapter presents the engineering change concept. Authors presenting these theories and concepts are Terwiesch and Loch and Jarrat and Caldwell. Still here are presented some models used in change management: Kurt Lewin's three-phase model, ADKAR model, people-centered implementation. The chapter three present the development of the change management process. Chapter four presents the methodology and hypothesis of the paper. Chapter five describe both companies which was analyzed in thesis, their comparison regarding the financial situation for the last years, but also regarding the change process, their comparison regarding the financial situation for the last years, but also regarding the change process. Chapter six is about statistic analysis of engineering change request for each company. Chapter eight presents the key performance indicators and chapter nine presents the proposals to improve the activities of implementing the changes. The thesis ends with the own contribution part, where the activities carried out for this work, the final conclusions and the formulated proposals are described in detail.

Results: Within the doctoral research, the own contribution consists of:

1. The state of knowledge of the field of change management, from its beginnings through the three phases: unfreezing, relocation and refreezing, described by Kurt Lewin until our days where the key performance indicators are those that provide the current status of change requests and are either automatically generated from the internal change request

system or have been implemented and generated based on internal change request data files.

2. The databases collected from the two companies carried out a quantitative analysis of statistical methods. The statistical analysis carried out as part of the research, by using real data from both companies, represents the status of the distribution of change requests by year and the distribution by month to provide a general picture of them.
3. The economic analysis of the key performance indicators for both companies, presents comparatively the evolution of the seven economic indicators (turnover, net profit, debts, fixed assets, current assets, equity, number of employees) for the two companies in which applied research took place. The analysis of the research from the process point of view of the two companies is carried out in order to highlight the production flow that the change request follows from creation to implementation and to present their similarities and differences.
4. Following the analysis from the perspective of the process of the stages of implementation of the change, in the framework of the doctoral research I contributed directly by proposing a way of tracking the current status of the change requests. The experience within company A, in the implementation of key performance indicators, offered as a starting point for the identification of specific key performance indicators, which would provide at any time the status of change requests at company B.
5. In order to optimize the steps during the implementation of change requests, the experience in the engineering field helped me to adapt the activities related to the implementation of the change to some methods that allow the optimization of the process. So, specific methods of the change process were implemented in order to optimize it.

Conclusions: In the framework of the present research, the implementation of an efficient system for tracking change requests, for company B, starting from the individual analysis (through statistical methods) of this process in company A and subsequently, the comparative statistical analysis between the two companies with the aim of to identify statistically significant differences that must be taken into account when implementing the system in company B.