

EXPLORING STRATEGIES IN CHANGE MANAGEMENT – CURRENT STATUS AND ACTIVITY BENCHMARK

F. Deubzer, M. Kreimeyer and U. Lindemann

Keywords: change management, management strategies, change management benchmark, revision, update

1. Introduction

Ever-present in the media are product recalls in automotive industry, indicating quality losses due to shortened innovation cycles, market pressure and customer needs. Whereas product recalls are noticeable to the customer, it is well-known that numerous modifications appear within the product development process, not noticeable to customers and public. Nevertheless, product changes result in time and cost consuming processes for the companies, and – in the worst case – are contributing to product recalls and thus leading to a lower corporate profile of the involved companies. A recently conducted survey, of which aspects relevant for change management strategies are presented in this paper, shows that about 22 % of all product modifications could be avoided [Deubzer et al. 2005]. With the number being slightly higher within certain branches, the survey leads to the conclusion that approaches need to be defined and actions taken to tap the full potential to eliminate avoidable late product alterations and thereby gaining efficiency in change management [Bullinger et al. 2003].

Being aware of the possibility to avoid a high percentage of costly product changes, most companies established a more or less resource-intensive change management, depending on each company's size and turnover. In the context of this paper, the term change management depicts the handling and implementation of product modifications of already released product attributes [Wildemann 2005] as a result of market- and innovation- or error-related demands, not to be confused with change management as managing of organizational changes provoked by market, technological innovations or society [Hammer & Chumpy 2004].

Against this background, a survey was conducted, highlighting both the current status of the key figures of change management such as the frequency of modifications or the length of change cycles as well as the selected activities and strategies in industry to deal with the issue. Additionally, an outlook is given on activities planned by the participating companies to address the problem in the future.

The main goals for this paper are the presentation of the survey's results, giving a brief overview about the current status of change management in the industry; second aim is providing the possibility for companies to rate themselves in the statistic, identifying their current situation and showing the need for action in the different areas of change management for their particular situation; as a third goal, the basic concept of a correlation analysis of change management strategies and effects is presented, meant to result in a framework allowing to identify which strategies in change management are perceived as the most promising ones and should be taken into account when intending to improve a company's change management.

2. The survey

The participants of the survey were chosen from defined sectors of the industry and had to fit certain conditions described in this section to form a homogeneous cluster. The number of participating partners was not higher than 50 due to the demand for a reliable data collection, limiting the availability of participants. Due to this proceeding, the survey could be conducted in a shorter period of time. Hence, the methodical framework introduced in this paper could be defined and verified before expanding the available data both in quantity and variety, and thus creating a more heterogeneous range, complicating reliable interpretations.

Two branches were chosen, the automotive sector on the one hand, including Original Equipment Manufacturers (OEM) as well as subcontractors, due to the mentioned problems in that branch in terms of quality and reliability. On the other hand, manufacturers of electrical equipment, producing goods ranging from single parts, such as switches, to home appliances participated in the survey.

Furthermore, the involved companies are located in German-speaking countries and operating internationally. Serial production had to overweigh unit production in each company's product portfolio. To obtain a wide range of the change management's key data, such as frequency of modifications – enabling not participating companies to classify themselves within the given margin – the company size was not restricted, thus resulting in partners from small scale to large scale industry. Given these boundary conditions, about 100 companies were contacted, 50 of which ultimately were involved in the presented results.

For the actual data collection a questionnaire was set up, consisting of four main sections. The first section addressed general questions about the company, such as number of employees or the company turnover, so that a clustering by company size or branch was possible during the data analysis. The second section covered the compilation of the change management key data, depicted in detail in the section "Results" of this paper. Section three dealt with economic issues, such as the detailed change cost determination, whilst the final section four covered the character of product modifications, asking questions about the portion of avoidable modifications, mandatory or optional modifications and ultimately weighing strategies for future avoidance of product modifications.

For filling in the questionnaires, their distribution over the internet, in form of paper or telephone interviews was arranged, whereas the telephone interviews clearly outweighed the other ways of distribution, contributing largely to the quality and reliability of the data. During the whole process of carrying out the survey, participants were picked by their qualification and contacted in person or by phone, so that the validity of their statements could be ensured. As a result of this preselection, the interviewed persons were primarily change managers, but in any case executives, responsible for an average of 60 % of product modifications within their company or division.

3. Immediate Results

According to the intention of the survey and derived from its structure, the following results could be derived directly after the data collection: an overview is given about the average state of current change management key data in the regarded industry, the current strategies and their relevance for the participants as well as promising strategies for the future from the companies' point of view. More detailed results, containing a differentiation of branches and tendencies considering a related survey from the year 1994 [Conrat 1997] are given in [Deubzer et al. 2005].

3.1 Current status of change management

Based on [Brecht & Geckler 2000] amongst others, the following key data for the current status of change management were identified and asked for in the questionnaire:

- (1) frequency of technical modifications: depicts the irregular product modifications per month, requiring steps back in the development process
- (2) length of change cycles: describes the number of days necessary for the complete organizational process from detection of the demand for modification to the finishing of subsequent tasks

- (3) product maturity at start of production: defines the period of time in months between start of production and the actual maturity for production of the product
- (4) market- and innovation-related modifications compared to subsequent corrections (error-related modifications): shows the percentage of product modifications due to not influencable circumstances (e.g. market) compared to error-related ones, demanding subsequent corrections
- (5) basically avoidable modifications compared to inevitable modifications: is the percentage of avoidable (e.g. by early identification of product properties) compared to inevitable modifications, both being a subset of error-related modifications and their sum adding up to 100 % of error-related modifications
- (6) mandatory and optional modifications: comparison of the percentage of modifications inevitable for the product to fullfill its required functions in contrast to optional modifications, for example due to design or performance revisions

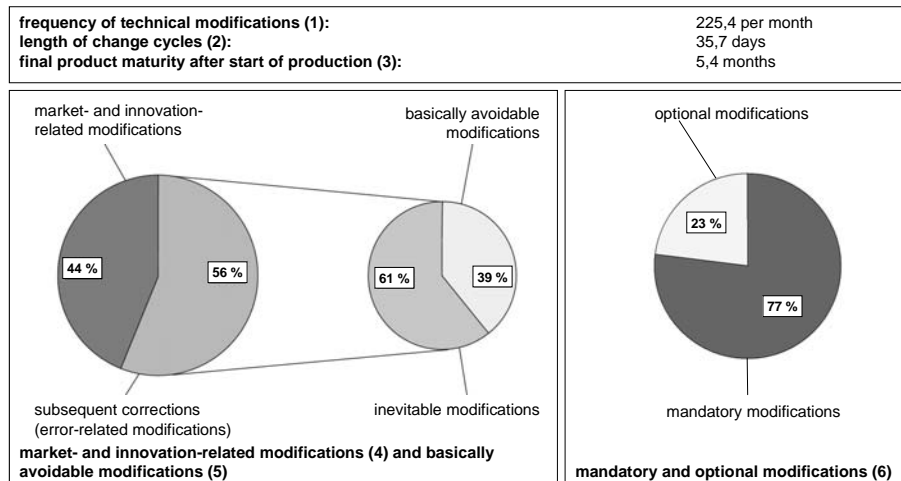


Figure 1. Current status of change management – Key figures (average)

3.2 Current strategies in change management

Described as current strategies in change management, the following figures show the weighing of actions taken by the industry to improve their change management. That way, the focus of current activities becomes clear. The list of strategies given as answering options in the survey can be summarized as described in the following:

- (A) capacity of deployed employees: percentage of human resources of a company working fulltime on change management processes
- (B) change cost determination: percentage of companies performing cost determination in context with change management, containing efforts in continuous cost determination and the determination of costs for bought-in parts, tools and production
- (C) early detection of change demand: percentage of companies putting effort into detecting necessary changes in the early phase of the product development process
- (D) determination of overall successions of modifications: percentage of companies trying to predict all possible successions of modifications
- (E) fast decision making: percentage of companies focussing on a fast decision making process to accelerate the revision process
- (F) fast implementing of modifications: percentage of participants with ambitions to shorten the period of time between detection and completion of modifications
- (G) reuse of approved solutions: percentage of companies documenting and reusing approved solutions and thus trying to avoid modifications by applying best practises

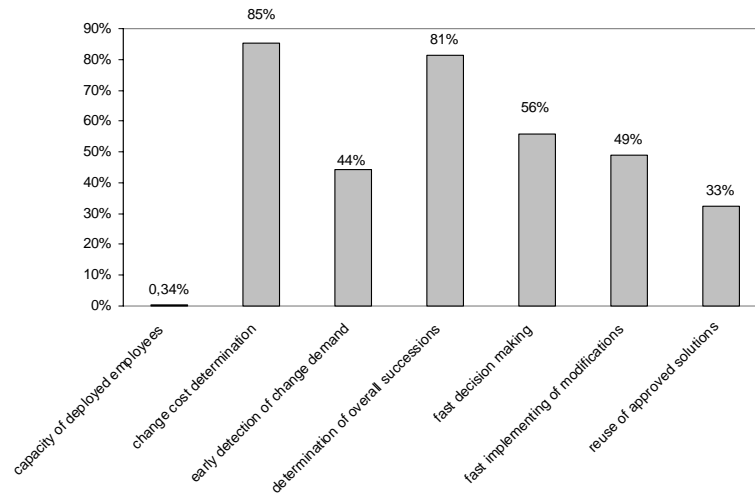


Figure 2. Percentage of companies being active in the current strategies

3.3 Future strategies in change management

As mentioned in the introduction of the survey's proceeding, the last section put forth a number of options for the avoidance of modifications. The participants hereby estimated the probability of success of these strategies from their point of view. The given strategies were:

- (I) qualification of employees
- (II) improved synchronization of employees and teams
- (III) increased cost awareness in product development
- (IV) increase deployed human resources in the early stages of the development process
- (V) use of checklists and methods such as QFD or FMEA
- (VI) reuse of approved solutions
- (VII) increased amount of experiments and prototypes in the early phase of the product development process

Figure 3 shows the percentage of companies rating the propability of success for the specified strategies as "very high".

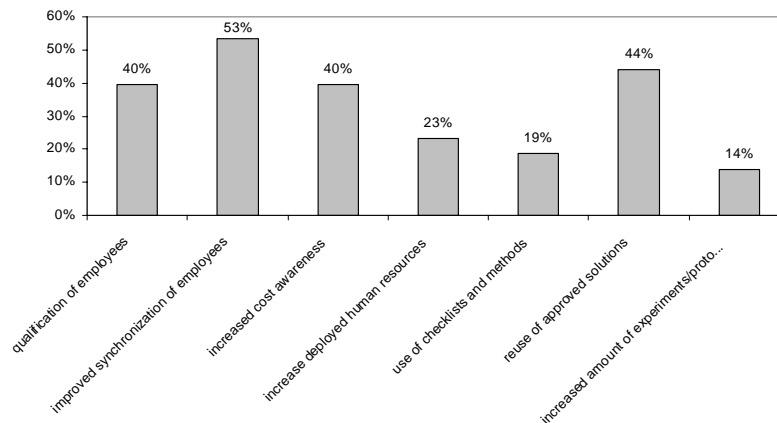


Figure 3. Future Strategies in change management (propability for success rated "very high")

4. Methodical framework for the classification of change management strategies

In change management of technical products, different strategies, methods and approaches exist, all dealing with the improvement of the processes concerning product modifications and their implementation. As the approaches are so numerous, their concepts are diverse and addressing the issue on different levels, such as the conception of products [Keller et al. 2005, Lindemann et al. 2005 and Ollinger & Stahovic 2001] or the design process and related tasks [ABmann 2000]. Integrated change management as an approach combines the technical aspects, processes and organizational tasks, making it obvious that different aspects contribute to a holistic solution [Lindemann & Reichwald 1998].

As resulted from the survey, the companies' activities exceed the fields of product and process, and contain aspects of human resources and cost management as well. Furthermore, the strategies can be subdivided on a more detailed level, each of them allowing a scope of different activities. Given this situation, it is obvious that different strategies contribute to the improvement of separate effects.

effects						strategies
frequency of technical modifications (1)	length of change cycles (2)	product maturity phase at start of production (3)	market-related compared to subsequent corrections (4)	basically avoidable compared to inevitable modifications (5)	mandatory and optional modifications (6)	
	++		+	+		capacity of deployed employees (A)
					++	change cost determination (B)
+	++			+		early detection of change demand (C)
		++	+			determination of overall successions of modifications (D)
	++			+		fast decision making (E)
	++	++				fast implementing of modifications (F)
+	+			++		reuse of approved solutions (G)

Figure 4. Hypotheses: Interdependencies of strategies and effects

To gain insight into this interdependencies between strategies and related effects, two different approaches were applied and are proposed in this paper. First, existing hypotheses (see figure 4; “+” indicating an assumed interdependency, “++” indicating a strong assumed interdependency) in research and industry are evaluated, based on the interviews with companies' experts and literature research; as a second approach, interdependencies are to be identified by the application of correlation analyses based on the statistical data at hand. Thereby, the framework does not only allow the companies to rate themselves in the statistics, but to assign the most promising future activities, depending on the actual status of the company and the ranking of promising strategies.

Based on the given strategies in change management, a realistic rating of the key data, for which a methodical approach was defined, can be achieved. For that purpose, five key factors were identified, summing up the strategies and depending onto the answers given in the survey.

Figure 5 shows the combination of strategies (A-G) to key factors, which are in detail:

- human resources,
- cost determination,
- emphasis on the early stages of development,
- speed of implementation and
- sustainability

Key factors	Strategies
human resources	capacity of deployed employees (A)
cost determination	change cost determination (B)
emphasis on the early stages of development	early detection of change demand (C)
speed of implementation	fast decision making (E)
	fast implementing of modifications (F)
sustainability	determination of overall successions of modifications (D)
	reuse of approved solutions (G)

Figure 5. Combination of strategies to key factors

The effects (1-6) related to the strategies were reduced to the most relevant ones in this paper. Available on basis of the survey are about 30 different aspects on the side of strategies and effects, which are to be combined to relevant key factors not only on side of strategies but also on side of effects in future research.

In the following examples, the effect “length of change cycles” (2) and two of the assumed interdependencies and related key factors are highlighted. The strategies “capacity of deployed employees” (A) and “early detection of change demand” (C), originally given as percentage, were standardized and reduced to an integral number with a range from “0” to “3”. Hereby, the separating borders were set at significant gaps in the statistical distribution, allowing the detachment from the discrete percentages. As a result, the maximum of the key factors “speed of implementation” and “sustainability” is “6”.

Figure 6 shows the correlation of the defined key factor “emphasis on the early stages of development” and the assumed related effect “length of change cycles” (2). Note that the number of analysed participants is below 50, due to the lack of separate values in particular cases. As the values are sorted ascendingly according to the key factor, a direct correlation between the key factor “emphasis on the early stages of development” and the “length of change cycles” (2) does not clearly exist in the given statistic. Anyhow, the tendency suggests that focussing on the early detection of change demand seems to shorten the length of change cycles noticeable when being practised with high intensity.

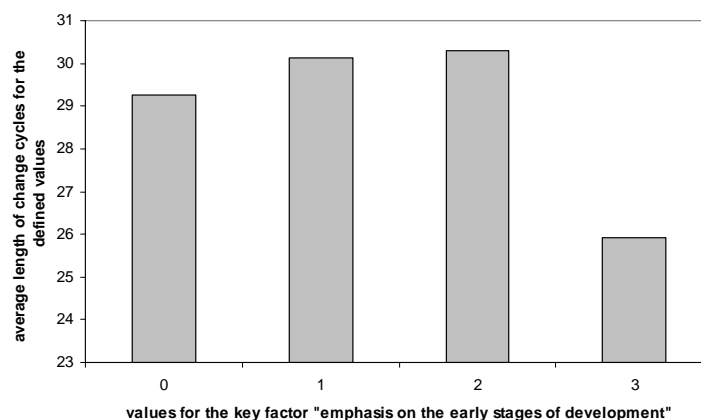


Figure 6. Key factor “emphasis on the early stages of development”

Likewise, figure 7 reflects the correlation of the defined key factor “human resources” and the assumed related effect “length of change cycles” (2). The distribution differs to figure 6, but the general tendency implies the length of change cycles rising with the amount of deployed human

resources. Thus, in contrast to figure 6, the statistic disproves the assumption of the amount of deployed human resources shortening the length of change cycles.

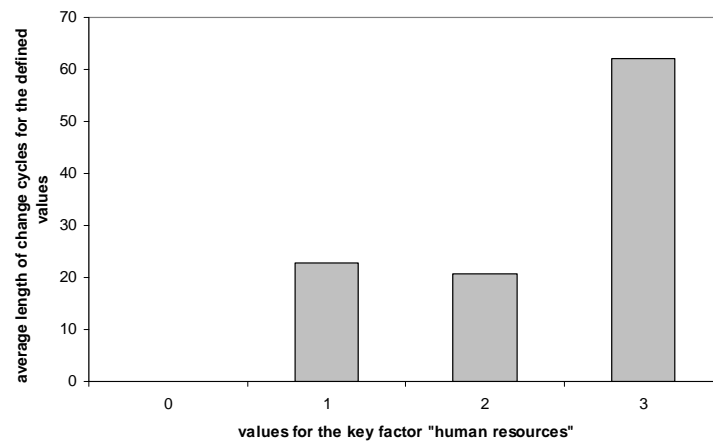


Figure 7. Key factor "human resources"

5. Discussion

The introduced survey and the corresponding framework combine current strategies in change management and actual tendencies in industry. Thus, a number of benefits becomes evident:

First of all, an overview about the current status of change management in German-speaking industry is given, allowing companies a self-assessment of their change management to rate themselves and identify shortcomings according to the average and most promising effects. Secondly, the combination of strategies and effects in change management has been accomplished, leading to the possibility to implement promising approaches in the future. Furthermore, the framework proposed provides scope for weighing and combination of different key performance figures, making a future adaption of the framework on basis of upcoming cognitions elementary. The ongoing statistical research can put a focus on future activities on the one hand and question current activities in industry and research.

As a downside of the proposed matters, the statistics do not yet show reliable statements while the research in that field is ongoing. A well-founded weighing of factors is not yet academically researched and leaves room for improvement.

6. Conclusions and future work

In this paper, the results of a survey in the industry were presented and a framework based on these perceptions was developed. Pointing out the relevance of the interconnection between activities and effects, the framework allows the evaluation of activities in change management and contains suggestions for the interlinkage of activities and effects. Benefits and downsides of the framework were discussed, leading to a number of future activities in research: first of all, the statistical database has to be expanded in quantity to be more reliable; secondly, the correlation analysis of the statistics has to be improved and new interpretations defined or the framework adapted. As an example, the combination of activities might be more promising and exceed the results of the consideration of single aspects, due to their interconnection.

Acknowledgements

The authors would like to thank Bernd Rock (ROCK Consulting GmbH) and Thomas Junior (Junior Consulting) for their support and close collaboration when collecting and interpreting the data presented in the survey.

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Frank Deubzer, Dipl.-Ing.
Technische Universität München (TUM), Institute of Product Development
Boltzmannstr. 15, D-85748 Garching, Germany
Tel.: +49 (0) 89 289 15147
Fax.: +49 (0) 89 289 15144
Email: frank.deubzer@pe.mw.tum.de
URL: <http://www.pe.mw.tum.de>