

Situational Change Engineering in Healthcare

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Abstract: Many developed countries are confronted with continuously increasing healthcare costs. Most administrations believe that a fundamental reorganization of the healthcare sector is inevitable. Transformation processes are often enabled by information and communication technologies. For healthcare, a plethora of eHealth strategies have been proposed, many of them being aimed at reducing healthcare costs by optimizing administrative processes. Although lots of strategies have been proposed, there is a lack of clear guideline for setting up transformation projects successfully. Since many healthcare systems are characterized by a high degree of autonomy and many local regulations, a situational approach for setting up transformation projects is necessary. In change management as well as in method engineering, situational approaches have been proposed. But there are few publications on how to combine situational change management with situational method engineering. Regarding applying such an approach to healthcare, there is no work at all. Therefore the aim of this paper is to propose a 'situational change engineering' framework for the healthcare sector. Three steps are essential: (1) to classify change projects in the healthcare sector with regard to certain transformation attributes, (2) to identify reusable method fragments that have been deployed in change projects of a certain type, and (3) to develop a procedure which creates a situational method from appropriate method fragments for the respective type of change. In addition to outlining this approach, a hypothesis for the first step is presented, i.e. a scheme is developed to classify change projects in the healthcare sector. The paper ends with a recommendation for implementing the 'situational change engineering' framework in the healthcare sector.

1 Introduction

Many developed countries are confronted with continuously increasing healthcare costs [Pr04]. E.g. in Switzerland, costs have risen 5.9 percent in 2004 compared to 4.6 percent in 2003 and 3.6 percent in 2002 [Sa05]. The reasons for this continuous increase in costs are multifarious. Next to facts like the aging society or the negative economic environment [Pr04], other main reasons can be seen in the inefficient division of labor on the side of the healthcare providers, inconsistent local regulations, and missing

networks and standards [VIG05]. In order to keep up the high quality of treatment and to avoid increasing insurance premiums for policy holders, a fundamental reorganization of the healthcare sector is often considered to be inevitable.

Transformation processes are often enabled by information and communication technologies [Be05]. For healthcare, a plethora of eHealth strategies have been proposed, many of them being aimed at reducing healthcare costs by optimizing administrative processes. Examples for eHealth strategies are those recommended by the WHO [WHO05], by the European Union [EC05, JEU03] or by Switzerland [FC06]. Although lots of strategies have been proposed, there is a lack of clear guideline for setting up transformation projects successfully. Since many healthcare systems are characterized by a high degree of autonomy and many local regulations, a situational approach for setting up transformation projects is necessary. In change management as well as in method engineering, situational approaches have been proposed. But there are few publications on how to combine situational change management with situational method engineering. Regarding applying such an approach to healthcare, there is no work at all. Therefore the aim of this paper is to propose a 'situational change engineering' framework for the healthcare sector. With the help of such a framework, the setup of transformation projects can be made more transparent, understandable and manageable.

The outline of this article can be described as follows. In the second section, it will be explained how IT already enables the transformation process in the healthcare sector. In sections 3 and 4, the state-of-the-art of change management and method engineering will be explained, respectively. Based on this state-of-the-art, the 'situational change engineering' framework will be proposed in section 5. In order to specify this framework for the healthcare sector, a hypothesis for developing a classification scheme for change projects is also presented in this section. In the final section 6, conclusions are drawn, and recommendations for future work are made.

2 IT Enabled Transformation

Many healthcare systems are slowly transforming, realizing that they need to intensify industrialization by applying IT [ÖFA01], thereby making processes more efficient, and ultimately reducing overall costs. This is one of the contexts, in which the term eHealth is used. Due to the fact that the term eHealth is quite new, a lot of different definitions exist. Eysenbach defined eHealth already in 2001. In his opinion "E-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology." [Ey01]. In addition to the definition of Eysenbach, the society for informatics in the healthcare sector analyzed some further definitions (e.g. from Dietzel, Baer etc.), consolidating these definitions into: "eHealth can be understood as the integrated use of information and communication technology to develop, support and network all processes and players in

the healthcare sector” [VIG05]. In order to enable the use of IT in healthcare sectors, different eHealth strategies have been developed. One strategy for example has been presented by the world health organization (WHO) [WHO05]. Other examples are two European strategies [EC05, JEU03] and several national strategies. As an example of a national eHealth strategy, the strategy of Switzerland is explained in the following.

The Federal Council of Switzerland is actively involved in developing the Swiss information society. In January 2006 the Federal Council revised its strategy for an information society of 1998. The main objectives stay the same as in 1998: “to apply the new information and communication technologies (ICT) quickly, in a coordinated fashion and for the benefit of all” [FC06]. In the beginning of the strategy paper the Federal Council defines principles which apply to all aspects of the information society. The most important ones are the following [FC06]:

- Access for all: All inhabitants of Switzerland must enjoy equal access to new ICTs, in order to be able to use them according to their needs. Access is equal if it is guaranteed independently of place and time, at all levels and at affordable prices.
- Empowerment for all: Using ICT must become a basic skill of everyday life. Constant education and further training at all levels of education are keystones of the information society.

In terms of measures, the Federal Council is focusing on eGovernment and eHealth. Regarding eHealth the Federal Council stated that it is necessary to develop a national eHealth strategy which is only possible in cooperation with the cantons (states of the federation), private organizations and the EU as well as WHO [FC06]. Through the application of ICT to the healthcare sector, the Federal Council hopes to achieve improvements in efficiency and effectiveness. This can only be realized by an implementation of the eHealth strategy. Therefore the Federal Council plans “to submit, by the end of 2006, a plan of a national e-health strategy and an action plan for the implementation of these measures” [FC06]. This strategy reveals that the Swiss healthcare sector is already transforming into the information age. But in order to go through this transformation successfully, it is necessary to develop specific recommendations of action. As potential sources for such recommendations, the research fields of change management and situational change management are discussed in the following section.

3 State-of-the-Art of Change Management

3.1 Change Management

Change management is profoundly connected with the theory of management and organization. Before introducing different change management approaches, the term ‘change’ will be defined. Baumöl takes a closer look at the term ‘change’ and defines it from different perspectives. First of all, ‘change’ can be seen as an action by which

something happens. Secondly 'change' can be understood as a process through which something happens. Finally 'change' can be interpreted as a result of an action or a process. [Ba05a] The efforts in handling 'on change' related to new markets and technologies, customers, products and services are found under many banners. According to Champy, efforts in handling 'on change' can be made through 'Reengineering Management' - but he is only addressing cultural and behavioral aspects [Ch95]. Kotter develops a change process under the headline of 'leading change'. As a part of that process, behavioral and cultural aspects are addressed too - but he is focusing on strategic aspects. [Ko97] In contrast to these authors, Brunsson and Olsen concentrate on organizational aspects [BO93]. Bowman and Kogut, referring to handling 'on change' as 'redesigning the firm', concentrate on organizational aspects, too [BK95]. Kochan and Useem refer to handling 'on change' as 'transforming organizations', and they realize that a holistic view on change projects is necessary. Therefore they defined four activities: (1) strategic restructuring, (2) using technology for strategic advantage, (3) using human resources for strategic advantages, and (4) redesigning organizational structures and boundaries. [KU92]

3.2 Situational Change Management

Even if the goal has been unchanged, the recent discussion of change management goes into a different direction. Due to the fact that change projects are always unique, the idea of situational change management was born, although only few authors have adopted the context-driven view on change projects yet. Baskerville describes a situational approach focusing on artifacts on the organizational level [Ba96]. In contrast, the framework presented by Friedman and Gyr concentrates on emotional aspects of change, mostly neglecting e.g. technology and process aspects [FG98]. Hall and Hord also provide a framework for handling context-driven change focusing on cultural and emotional aspects, too [HH01]. A comparatively holistic approach is presented by Müller-Stewens and Lechner, because they do not only address emotional aspects, but also take strategic, organizational and technical aspects into consideration [ML03].

Recent studies document that still a lot of transformation projects fail due to a variety of reasons [Ca05]. One big issue are mental and cultural barriers, such as employees who undermine transformation projects or management who does not sufficiently support the transformation process [Ca05]. On the other hand, transformation projects fail due to the fact that not all relevant aspects (e.g. strategic, organizational, technical or cultural) of a transformation project are considered [Ba05a] and that methods and models are missing in order to conduct transformation projects in a goal oriented, structured and situational way [ÖW03].

Situational change management approaches addressing different aspects of change projects can be found already (see e.g. [ML03]). But such approaches have not been combined with methods and models yet in order to make change projects transparent and controllable. Hence the following section discusses the state-of-the-art of method engineering before the situational change management and method engineering approaches will be combined in chapter 5.

4 State-of-the-Art of Method Engineering

4.1 Method Engineering

Heym defined method engineering as the systematic and structured approach to develop and modify methods by describing method components and their relationships [He93]. The developed methods are effective solutions for specific situations. Furthermore Heym identified the following method components: activities, roles, techniques, results and a metamodel. [He93] Gutzwiller illustrated the interrelation of these components [Gu94].

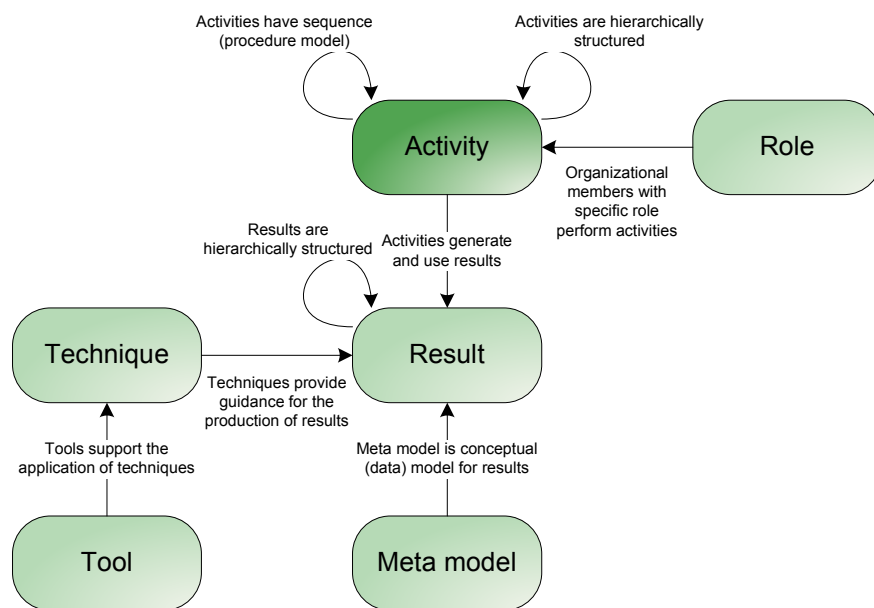


Figure 1: Method Components (cf. [Gu94])

A transformation project consists of different activities. Activities are construction tasks which create certain results (i.e. which create certain specification documents). Activities are assigned to roles (e.g. people, job descriptions or organizational units). Techniques are detailed instructions for the development of results, i.e. for the execution of certain activities. They are supported by various tools. The meta model specifies the information model of the results, thereby guaranteeing the consistency of the entire method [Gu94]. This set of constituent elements has been validated by a recent literature review in [Br05].

According to the analysis in Braun et al. [Br05], there are first and foremost practice-oriented method constructions which are primarily empirical in their argumentation core, whereas ‘academic’ method constructions can be classified as rationalistic in respect of their knowledge source. From an epistemological perspective, method construction can be considered to be objectivistic in nature, its validation mostly performed by means of

verification, and its general research approach to be qualitative. While practice-oriented method constructions rely in particular on action research, surveys and interviews, document analysis and exploration by means of case studies and field studies, ‘academic’ methods in contrast are primarily using document (literature) analysis and deduction. A recent development is to use formal approaches (like e.g. ontology-based modeling [GBE05]) for constructing methods. Since just a consolidation of observed practices without any deductive elements and / or without at least some assessment along normative guidelines seems not to be useful, most method construction approaches combine inductive elements (case studies, field studies, surveys) with deductive elements (e.g. theory-driven method elements).

4.2 Situational Method Engineering

Even early work on method engineering acknowledges the fact that methods always are more or less generic and have to be extended and/or configured in order to be applicable to a specific problem. Brinkkemper and Harmsen were one of the first introducing situational method engineering [Br96, Ha97]. Situational Method Engineering “is the discipline to build project-specific methods, called situational methods, from parts of the existing methods, called method fragments.” [BSH99]. Method fragments “are stored and retrievable from a so-called method base” [Br96] resp. a repository [HS05]. “The aim of frameworks for situational method engineering is usually to guide the process of selecting and integrating different method fragments into congruent and consistent methods relevant for the situation at hand” [KA04]. One of the first configuration processes for situational methods was developed by Brinkkemper (cf. Fig. 2), which has been taken as a basis by many other authors (e.g. cf. [KA04, PL96]).

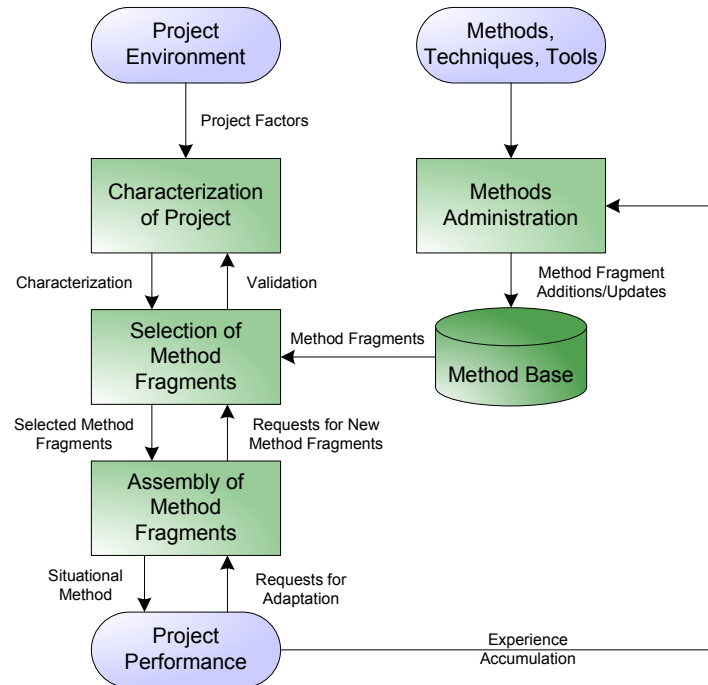


Figure 2: The configuration process for situational methods (cf. [Br96])

5 Situational Change Engineering Framework

5.1 Procedure for a Situational Change Engineering Framework

Using the discussions in chapter 3 and 4 as a theoretical basis, a ‘situational change engineering’ framework is presented in this section. The framework construction is comprised of three steps:

1. Development of a classification scheme for change projects in the healthcare sector.
2. Identification of reusable method fragments that correspond to activities in change projects.
3. Development of a procedure to compose situational methods using method fragments.

In order to develop a classification scheme for change projects in the healthcare sector it is necessary to identify description parameters from change projects that have been successfully carried out in the healthcare sector. The data necessary for the definition of these parameters can be obtained through literature research and interviews conducted in different healthcare institutions. Based on this data, common contexts of change projects are identified which can be used as reference contexts. This is achieved by clustering the change projects under investigation according to their description parameter values. By means of this analysis, it will also be possible to reveal a set of description parameters which is used in most change projects in the healthcare sector. In addition, context-dependent description parameters are identified that are specific to a certain cluster of change projects. [Ba05a]

After identifying the description parameters, activities can be assigned in order to operationalize these parameters. For instance, the descriptive parameter 'new skill profiles' is operationalized by assigning the activity 'defining new skill profiles' [Ba05b]. Starting with activities as "lead elements", method fragments are defined according to the meta model (cf. chapter 4.1). Based on the activity model which is derived from the description parameters, the procedure model, roles, results, techniques, the information model and maybe tools have to be specified. All developed method fragments will be collected and administered in a repository. In doing so, it will be possible to add new fragments or to delete obsolete ones as well as to edit existing fragments [Ba05a].

Method fragments can be combined individually to a situational method according to the context at hand. The combination of method fragments to a situational method is specified by rules. These rules are comprised in a rule base which is also part of the repository. It can be distinguished between two types of rules: basic rules and detail rules. Basic rules have to be applied for all method constructions. Detail rules will be applied according to the context of a specific change project. They are based on the change project clusters defined in the classification scheme. In doing so, context-specific activities resp. fragments will be identified. Finally the combination of basic activities identified with the help of the basic rules and context-specific activities form the situational method [Ba05a], with which a specific change project in the healthcare sector can be supported.

5.2 Healthcare Change Project Classification Scheme – A Hypothesis

In the previous section, the development of a classification scheme for change projects was identified as a prerequisite for situational change engineering in healthcare. As already stated, a classification scheme can be developed by reviewing literature contributions and by conducting interviews with healthcare institutions.

A particular interesting literature contribution is the work of Baumöl. In [Ba05b], she conducts a survey for analyzing change projects in order to derive a (general) change project classification framework. Her survey is based on companies which "were selected according to criteria [...] 'diversity of industry' (=high), 'age' (range from start-up to maturity), and 'company size' (=range from small to large)" [Ba05b]. Furthermore

geographical diversity is achieved by choosing companies from the U.S. and German-speaking countries (Germany, Austria and Switzerland). The chosen sample “aimed at a broad variety of companies to capture as many ways of dealing with change in as different contexts as possible” [Ba05b]. The characteristics of the 52 analyzed companies are exhibited in table 1.

	Silicon Valley/Bay Area	Germany, Austria, Switzerland
Industry		
Automotive/Logistics	1	5
Consulting	4	3
Chemical Industry	3	1
Computer Equipment	1	1
Electronics and Software	11	3
Engineering/Manufacturing	2	3
Financial Services	1	5
Commerce	1	0
Information Services/Education	4	1
Telecommunication	2	1
Age (in years)		
< 10	9	4
10-50	16	5
> 50	5	13
Employees		
< 1000	8	8
1000-50000	14	10
> 50000	8	4
Revenue (in \$M 2002)		
< 500	7	5
500-5000	7	6
> 5000	16	11

Table 1: Characteristics of the companies analyzed for the survey (source: [Ba05b])

The survey is based on an open questionnaire and the analysis conducted afterwards reveals five different reference contexts for change projects [Ba05b]:

1. Change projects having a focus on comprehensive strategy adaptation
2. Change projects having focus on redesigning the communication and interaction with customers and partners within the business network (e.g. suppliers, vendors, even competitors)
3. Change projects dealing with growth strategies and cultural aspects placed in a technological context
4. Change projects having a focus on process engineering or process redesign
5. Change projects dealing with the improvement of organizational agility

“The results of the analysis highlight that first of all, the topical context [see above] of a change project rather than the environmental context [e.g. industry, size, age etc.] determines the way it should be dealt with” [Ba05b]. Due to the fact that the topical

rather than the environmental context of change projects is important the above mentioned classification framework can be adopted to the healthcare sector. Therefore the presented classification scheme will be used as a basis to classify change projects in the healthcare sector. In order to validate this hypothesis, it is necessary to conduct interviews with different institutions of the healthcare sector.

Although we claim that the classification framework mentioned above can be easily adapted to the healthcare sector, the analysis conducted by Baumöl reveals another interesting question. When looking for situational change engineering in healthcare, the term 'situational' has to be carefully revisited. Following the results of Baumöl, 'situational' does not address exogenous factors, e.g. type of healthcare institution, size of healthcare institution or special situation due to local regulations. Instead, the analysis reveals that the aim of the transformation project determines the way it should be dealt with - therefore giving the term 'situational' a new meaning. 'Situational' now refers to the aim of the change projects rather than the environmental factors. In doing interviews with different healthcare institutions – as mentioned above – this assumption has to be validated as well.

6 Conclusions and Future Work

We expect that in many developed countries, a large number of large-scale, high-risk change projects will be started in order to transform the respective country's healthcare sectors towards industrialized, more cost-efficient structures. Due to the fact that systematic, 'engineered' approaches to transformation are regarded as being superior to an intuitive, 'guru' approach [IS01, Wi01], we propose a 'situational change engineering' framework in this paper. Based on this framework, the setup of change projects could be systematically constructed from generic method fragments and scenario specific, situational fragments. By using a systematic procedure for project structuring, such large-scale, high-risk change projects become more transparent, and their consistency with the respective transformation scenario is enhanced.

In order to implement the proposed three steps for developing the 'situational change engineering' framework, we presented a hypothesis for change project classification in healthcare. Following this hypothesis, the topical rather than the environmental context of change projects determines the way they should be structured. Two different conclusions can be drawn: On the one hand, a validation survey may prove that the presented classification framework can be adapted to the healthcare sector. On the other hand, the term 'situational' may have to be interpreted differently in this domain: 'Situational' may not be referring to exogenous factors, but to the different goals of transformation projects. The next steps therefore will be to empirically validate the discussion of these assumptions. Based on this discussion, further steps will include the identification of method fragments and the development of a procedure to assemble situational methods using such fragments.

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