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Abstract. Both ISO/IEC 15504 (SPICE) and ISO/IEC 33014 include a step in their improvement process called: Develop action plan. But which actions should you include, and are you sure that these actions cover all aspects? We have performed a thorough study of the change strategy literature that is the foundation for the ten overall change strategies defined in ISO/IEC 33014. We have extracted statements from this material that represent generic actions recommended by the authors for each strategy. Through analytic induction we have then identified and validated eight aspects that you should consider when choosing your concrete actions for executing the strategy.

Keywords: organizational change; change strategy; action plan; process improvement; ISO/IEC 33014; ISO/IEC 15504; SPICE.

1 Introduction

Process improvement is a challenge irrespective of whether you seek formal assessment of your general maturity through one of the prominent frameworks like CMMI [1], ISO/IEC 15504 (SPICE) [2], or merely want to improve those processes you feel are in most urgent need. Process improvement is, however, only one type of organizational change. They are all about changing people's way of working and consequently inherently complex, difficult and often prone to failure.

You must therefore carefully select your change strategy before you develop a detailed action plan. These can never be standardized, because they are heavily dependent on your context and the nature of change you want to achieve.

So, where can you look for guidance when you need to decide on your change strategy? ISO/IEC 33014 [3] defines ten distinctly different overall change strategies for you to choose from. The ten change strategies are listed in Table 1. Each strategy is based on a comprehensive survey of management literature, the most encompassing of these are by Mintzberg et al. [4] [5], Senge [6] and Huy [7].

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Table 1. The ten overall change strategies defined in ISO/IEC 33014 (re. table 4 in [3]). The literature examples are those where we found most recommended actions related to the change strategy.

Change strategy	Definition and literature examples
Attitude-driven (Learning-driven)	Change is driven by a focus on organizational learning, individual learning and what creates new attitudes and behavior. Lit.ex: Senge [6], Huy [7]
Commanding	Change is driven and dictated by (top) management. Management takes on the roles as owner, sponsor and change agents. Lit.ex: Huy [7], Mintzberg [4] [5]
Employee-driven	Change is driven from the bottom of the organizational hierarchy when needs for change arise among employees. Lit.ex: Kensing [8] [9], Andersen et al. [10]
Exploration	Change is driven by the need for flexibility, agility, or a need to explore new markets, technology or customer groups. Lit.ex: Benner and Tushman [11], Senge [6]
Measures-driven	Change is driven by measures and measurements. Lit.ex: Oakland [12]
Optionality	Change is driven by the motivation and need of the individual or group. It is to a large degree optional whether the individual takes the innovation into use. Lit.ex: Rogers [13]
Production-organized	Change is driven by the need for optimization and/or cost reduction. Lit.ex: Benner and Tushman [11], Liker [14], Huy [7]
Reengineering	Change is driven by fundamentally rethinking and redesigning the organization to achieve dramatic improvements. Lit.ex: Bashein et al. [15], Davenport [16], Hammer and Champy [17], Huy [7]
Socializing	Change in organizational capabilities is driven by working through social relationships. Diffusion of innovations happens through personal contacts rather than through plans and dictates. Lit.ex: Huy [7], Snowden and Boone [18], Gittel et al. [19] [20]
Specialist-driven	Change is driven by specialists, either with professional, technical, or domain knowledge. Lit.ex: Ciborra [21], Simon [22] [23]

The ten strategies were originally identified during the Danish research project Talent@IT (2003-2006) and the results were presented at conferences (e.g. [24]), in journals (e.g. [25]) and in a book [26]. A questionnaire-based tool was also developed to identify which (combination) of the strategies would be most suitable in a specific context ([26] p. 173).

However, once the change strategy (combination) has been selected (see Figure 1, ISO/IEC 33014 clause 6 step 4), little help has previously been available to assist management or process consultants in developing the detailed action plan as required in clause 5 step 4 of ISO/IEC 33014 (see Figure 1), or the identical step 4 in figure 4 of ISO/IEC 15504-4 (SPICE) [2].

To alleviate this, we have performed a thorough study of the change management strategy literature that is the foundation for the ten overall change strategies defined in

ISO/IEC 33014. We have extracted statements from this material that represent recommended actions by the authors for each strategy. We have primarily focused on the (top) management perspective.

During this process we have identified and validated eight aspects that can be seen as overall headings or categories for the actions. We believe that these eight aspects can be supportive for the management or process consultant and change agent when developing and executing a specific action plan for a change in a particular context. The eight aspects are listed in Table 2.

In this paper we first present the process of extracting relevant recommended actions from the change management literature and how we arrived at identifying the eight aspects. Then we discuss the usability of these aspects and to what extent they cover the ten change strategies in ISO/IEC 33014.
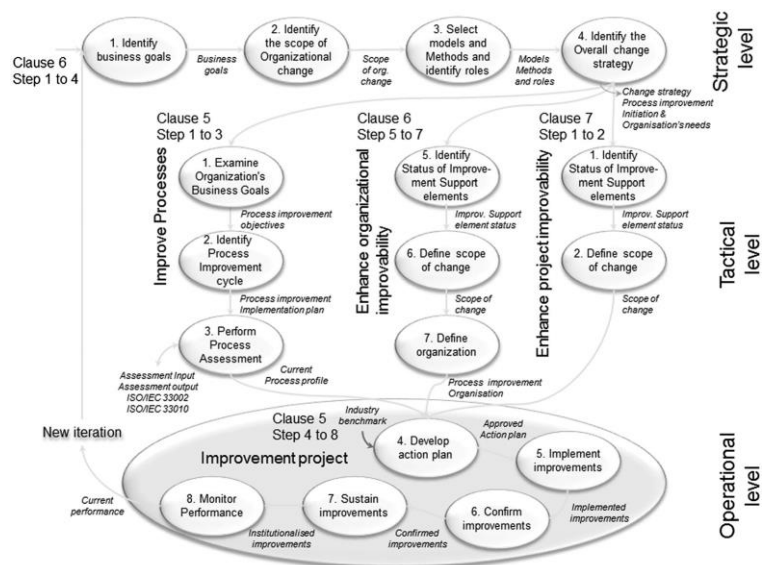
Fig. 1. Overview of the ISO/IEC 33014 model (figure 1 in [3]). This paper focuses on clause 6 step 4 (Identify Overall change strategy) and clause 5 step 4 (Develop action plan).

2 What Have Others Done

There are huge amounts of literature on change strategies and general recommendations on how to organize and conduct strategic changes. Among the widely known and broadly recognized can be mentioned: Kotter focusing on an eight point plan for a change [27]; Hammer and Champy arguing for reengineering the whole corporation [17]; Mintzberg's overall conceptual frameworks for understanding and changing different organization structures [4]; Rogers' deep analyses of adoption

and diffusion of changes [13]; Senge's approach to change organizations through socializing and learning [6]; and Huy focusing on structuring and sequencing of strategies over time [7]. Most of these have been central in setting the scene for the research reported in this paper. Finally, the ISO/IEC standards mentioned above [2] [3] have also contributed to defining the steps in planning and executing a change.

In his influential book on strategy safaris [5] Mintzberg and his co-authors suggest a set of 'strategy schools' approaching the strategy formation process as: a conception, a negotiation, a transformation, or as being a formal, analytical, visionary, mental, emergent, collective or reactive process. These ten distinct schools might be supportive for characterizing a specific change process or categorizing an approach or methodology.

Balogun and her co-authors [31] [32] provide a diagnostic framework called the 'change kaleidoscope' for identifying appropriate 'design choices'. This framework consists of three layers: The organizational strategic change context referring to the broader strategic analysis conducted; eight essential features of the change context (time, scope, preservation, diversity, capability, capacity, readiness, and power); and six dimensions of choices open to the change agent (path, start-point, style, target, levers and roles).

Next to the academic literature lots of consultants, bloggers, consultancy companies etc. have provided their lists of suggestions and recommendations. An example could be strategy+business that provides ten principles for leading change management [28] focusing on culture, how to involve all layers in the organization, how to engage and lead etc.; or Forbes [29] that suggest ten recommendations that are derived from science.

However, most of the literature presents specific strategies and recommendations on how to plan and perform a change. It focuses on the processes to be employed in the planning and execution of the change. A multitude of three to seven stage models are promoted by many authors as presented in the overview paper by Al-Haddad and Kotnour ([33] p. 246).

Throughout the literature are mentioned aspects like: motivating people and sharing the vision. But the main focus in the literature remains on how to structure and plan the change and the processes to be followed. The aspects mentioned are not turned into a framework of common aspects to be considered by managers, process consultants and change agents in their planning and design of the actions to be performed. The common aspects we have identified are: Communication, Culture, Competences and training, Decision-making, Knowledge acquisition, Methods and techniques, Organizing, Processes and plans (see Table 2).

3 Our Research Approach

Our research approach is based on analytic induction. Znaniecki in his book [34] outlines this approach in a number of steps:

> "Begin by studying a small number of cases of the phenomenon to be explained, searching for similarities that could point to common factors. Once a hypothetical explanation has been developed further cases are

examined. If any one of these does not fit the hypothesis, either the hypothesis is reformulated so as to match the features of all the cases so far studied, or the original definition of the type of phenomenon to be explained is redefined, on the grounds that it does not represent a causally homogeneous category. Further cases are then studied until no more anomalies seem to be emerging." (quoted from Wikipedia)

We began by extracting recommended actions from the literature behind two of the ten ISO/IEC 33014 strategies (Optionality and Specialist-driven, see Table 1). We read the texts from end-to-end and extracted statements by the author(s) that seemed characteristic for the strategy. One of us was reading the texts and the other was reviewing the extracted recommendations for action.

We kept the recommendations as close to the original statements in the texts as possible. Our main intervention was to make the statements actionable i.e. put them into imperative form. An example of such a reformulation of a statement is: "Leadership of change belongs to one small group of people, typically located at the top of the formal hierarchy" ([7] p. 605), which was reformulated to a recommended action: "Ensure that leadership of the change belongs to one small group of people typically located at the top of the formal hierarchy".

When we looked at the resulting recommended actions we could see that some of the recommendations were addressing the same aspect of the change (e.g. culture). We identified eight such aspects. Most of the recommended actions could be allocated to one aspect only. However, in some cases a recommended action was allocated to two or at most three aspects. This was no surprise to us as we had deliberately kept the original formulation of the statements in the texts, which therefore could include several aspects.

We then hypothesized that these eight aspects would be applicable also to the recommendations for the remaining eight strategies. We discussed each aspect and defined them properly. We quickly realized that the aspects were not completely orthogonal, which was never our intension. We regard the aspects as a kind of check-list for management or process consultant, who develops and executes a change process. Their applicability in practice is more important to us than whether they are 100% precise. The eight aspects are listed in Table 2.

To validate the hypothesis we repeated the same process for two more of the ten strategies (Production-organized and Socializing, see Table 1). The extracted statements from the corresponding literature were now analyzed whether they could be allocated to the previously identified aspects. We found this rather easy, which seemed to confirm our hypothesis.

However, to make sure that this was not the result of our bias we presented our results to the authors of [25], who had also been involved in the Talent@IT project and one of them our partner when the ten strategies were originally identified. They proposed three more aspects based on their knowledge from improvement projects. We analyzed their proposals and found that two were already covered by our aspects, and the third required an addition to the description of one of our aspects. The review thus resulted in a consolidation of the eight aspects.

With these changes in place we went on to repeat our process for the remaining six strategies. During this process we did not find any need to update our definition of the aspects, and the recommended actions could again be allocated to no more than three.

Table 2. The eight aspects of recommended actions for executing a change, with examples.

Aspect	Short explanation and examples
Communication	Types of information that should be communicated, to/by whom, when/through which channels. - "Communicate often and focus on the opportunities" ([15] p. 6). - "Develop and publish clear documented corporate beliefs and purpose - a mission statement" ([12] p. 36).
Culture	The culture that should be established / changed / supported in the organization to secure the success. - "Encourage people to challenge and examine alternatives" ([7] p. 619). - "Encourage individuals to establish improvement goals for themselves and their groups" ([12] p. 19).
Competences and training	The competences management and change-team should have before the work on the change is initiated, or which should be built up on the way. - "Ensure that the local adopters are sufficiently educated/trained to understand the big picture about the available innovation/change" ([13] p. 399). - "Develop leadership skills among middle managers to install new values in them" ([7] p. 620).
Decision-making	Decisions and commitments it is important to make and achieve before and during the work on the change, who should make them, when and within what scope. - "Shift power to the experts (specialists) by virtue of their knowledge" ([4] p. 106). - "Base your management decisions on a long term philosophy, even at the expense of short term financial goals" ([14] p. 5).
Knowledge acquisition	The knowledge that should be obtained / gained / collected before and during the work on the change. - "Ensure that the impact of existing initiatives are evaluated and considered carefully before starting another series of improvement initiatives" ([12] p. 159). - "Analyze constraints and evaluate specifications" ([22] p. 189).
Methods and techniques	Concrete methods and techniques that should be used in order to execute the change. - "Co-ordinate, advise and manage instead of keeping control centrally" ([21] p. 39). - "Forget the past, break rules and traditions in order to create variation" ([11] p. 251).
Organizing	How the change-team as well as all involved or affected by it should be organized / structured. - "Establish and cultivate communities of practice" ([21] p. 22). - "Form quality improvement teams with representatives from each department" ([12] p. 19).
Processes and plans	Concrete plans and processes that management and change-team establish for the work. - "Overhaul processes which create a vicious cycle of overload, stress, burnout and low morale" ([7] p. 612). - "Ensure control at all stages of planning and operationalization of the strategy" ([5] p. 55).

As a final review we presented the recommended actions and the aspects to a team of master students at Roskilde University specializing in process improvement, and they found them applicable to their own company contexts.

Through our application of analytic induction as described in the beginning of this section, we believe that we have validated our hypothesis and that the eight aspects we have identified have relevance and applicability to practitioners in the change management field. But of course further use in practical contexts must be performed to prove this.

4   Results

As mentioned in the previous section we went carefully through a number of books (17) and papers / articles (15) aiming at identifying recommendations for (top) management, process and change consultants on how to organize and carry out strategic changes.

The first rough list contained a total of 665 recommendations distributed over the ten different change strategies mentioned in ISO/IEC 33014 [3]. For most of the strategies we identified between 50 and 104 recommendations. However, the strategies of Commanding and Optionality were considerably lower with respectively 33 and 28 recommendations each.

We also identified a number of recommendations with such general intent that they could be relevant for almost all strategies. We will not discuss these further here, except report that they also can be allocated to our eight aspects.

We reviewed all 665 recommendations and selected those recommendations that were most clearly indicative of each the ten strategies. This selection resulted in a total of 233 recommendations for the ten strategies distributed as listed in Table 3.

Our analytic induction then identified eight generic aspects that managers, process consultants and change agents need to consider when planning and executing changes. We consider these eight aspects to be useful when developing a context specific change plan. The eight aspects are listed in Table 2.

As mentioned in the previous chapter we evaluated, verified and validated the relevance and applicability of these eight aspects.

One of the ways of testing our hypothesis was to map the distribution of recommendations on the eight aspects and ten strategies. This resulted in the picture shown in Figure 2. As it can be seen the coverage of aspects for each strategy differs a lot. We will reflect on this in a following section (5.1).

It should be noted that the total number of Xs in the cells is greater than the 233 recommendations we have selected. The reason is that some recommendations could be allocated to more than one aspect. For example the recommendation for the Specialist-driven strategy: "Design organizational units where, to the greatest degree possible, local decision makers confront the full range of issues and dilemmas" ([6] p. 287) can be allocated to both the Organizing and Decision-making aspect. In total we had 133 recommendations with a singular aspect-categorization, 91 with tuple, and only 9 with a triple categorization distributed on the strategies as shown in Table 3.

	Communication	Culture	Competences and Training	Decision-making	Knowledge acquisition	Methods and Techniques	Organizing	Processes and plans
Attitude-driven	XXXX	XXXXXXXXXXX	XXXXXXXXXXXXX	XX	XX	XXXXXXXXXXX	XXX	X
Commanding	XXXXXXX			XXXX		XXXXXXX	XXX	XXXX
Employee-driven	X	XXXXXXX	XXXXX	XXXXXX	X	XXXXXXX	XXXXX	
Exploration	X	XXXX	XXX	XXXX	X	XXXXXXXXXXX	XXXXXXXXXX	XXX
Measures-driven	XX	XXXX	XXX	XX	XXX	XXXXXXX	XXXXX	XXXXXX
Optionality	XXX	XXXX	XX	XXX		XXXXXX	XXXXX	X
Production-organized	X	XXX	XXX	XXXXXX	XX	XXXXXXXXXX	XXXXX	XXXXXXX
Reengineering	XXXXXXX		XX	XXXXXX	XX	XXXXXXX	XXX	XXXXXXX
Socializing	XX	XXXXXXX	XXX	XXX	XX	XXXXXXXXXXXXXX	XXXXXX	X
Specialist-driven	XXX	XX		XX	XXXXX	XXXXXXXXX	XXXX	XX

Fig. 2. Mapping the selected recommendations onto aspects and strategies. Strategies are listed by rows, aspects by columns and number of recommendation as cell contents (Xs).

Table 3. Overview of the number of selected recommendations per strategy, and whether they were allocated to one or more aspects.

Change strategy	Total	Single aspect allocation	Tuple aspect allocation	Triple aspect allocation
Attitude-driven	35	20	12	3
Commanding	19	13	6	0
Employee-driven	22	12	10	0
Exploration	25	11	14	0
Measures-driven	21	13	5	3
Optionality	16	8	8	0
Production-organized	27	18	8	1
Reengineering	21	9	11	1
Socializing	25	12	12	1
Specialist-driven	22	17	5	0

5 Discussion

As mentioned previously the eight aspects we have identified are to some extent recognizable in many other authors' recommendations and reflections on 'general' issues to consider when planning and executing change activities.

Most influential authors argue for establishing a vision for the change, motivating the involved actors, and they provide specific recommendations for how the change work should be organized and which specific methods and approaches to apply. In this light we could say that they indirectly address all our eight aspects in various amount of detail.

The aspects: Organizing, Communication, Methods and techniques, Processes and plans are addressed by almost all authors writing about change and change strategies.

The aspects: Decision-making, Culture, and Competences and training are also reflected upon by many authors. However, we have found fewer authors explicitly recommending actions related to the Knowledge acquisition aspect, both with respect to information collection before the change process is initiated and during the execution of the change (i.e. feedback).

Even though all eight aspects can be found in various wrappings and detail very few of the classic publications on change and change strategies aim at providing a comprehensive set of all aspects that could be relevant to consider when developing recommendations for concrete context-specific action.

Since our aspects were derived from a study of this literature looking for recommended actions for an action plan, it is of no surprise that the aspects we have identified are reflected in much of the prominent change management literature.

Therefore, we will not claim that the individual aspects we have identified constitute something new. The interesting result of our work is that these eight aspects together seem to constitute a complete framework of relevant aspects to consider when developing change action plans. And we have found only a few attempts at providing a framework for supporting change strategies with specific recommendations.

Mintzberg and his co-authors [5] suggest a set of 10 'strategy schools' approaching the strategy formation process along different dimensions (schools). These strategy schools provide a framework for overall characterization of the change as: a conception, a negotiation, a transformation, etc. It will, however, be difficult to characterize specific recommendations by means of these schools.

Balogun and her co-authors [31] [32] with their 'change kaleidoscope' provide eight features of the change context, e.g: capability, capacity, power and readiness. Furthermore they suggest a list of dimensions which the change agent can act on, e.g: style, levers and roles. Again, this framework is more directed towards characterizing a specific change or strategy, but is not suited for characterizing specific recommendations.

Finally, the ISO/IEC standards [2] [3] issue guidelines for how to plan and manage process improvements in organizations (see Figure 1). They mention all of our eight aspects, but they keep the guidelines at an overall level with very few detailed recommendations for action.

5.1   Reflections on aspect coverage of strategies

An interesting thing to observe and consider has to do with the coverage of aspects in the recommendations we have selected for each of the ten strategies. Figure 2 provides an overview of this coverage and Table 3 presents a little more detail.

The first observation is the fairly uneven distribution of the number of recommended actions for a strategy (Xs in Figure 2) related to each aspect. The aspect of Methods and techniques is by far the most common across all ten strategies i.e. 93 recommendations and only 18 for Knowledge acquisition. This could be explained by the fact that when authors provide recommendations on how to execute changes, it is quite natural that they suggest specific methods and techniques. Another explanation could be that our definition of the Methods and techniques aspect is too broad.

However, we have yet found it hard to split it without creating a rather artificial distinction for this aspect.

If we look into the specific distribution of aspects for each strategy we also see significant differences. E.g. we have found no recommendations for three aspects in the case of the Commanding strategy. And in the case of the Employee-driven strategy another set of three aspects are covered with only 0-1 recommendations.

In a number of Danish organizations the authors of [25] have found that Optionality, Specialist-driven, and Socializing strategies come out as best strategy fit. Furthermore, due to external requirements dictating the change a Commanding strategy was also often a good fit. For illustrating the discussion we'll look a bit more into these four.

For the Optionality strategy the most frequent recommendations belong to the aspects Methods and techniques (6) and Organizing (5), whereas Knowledge acquisition has not been mentioned at all in any of the 16 recommendations selected for this strategy. An example of a recommendation in Methods and Techniques for the Optionality strategy is: "Allow locally perceived needs and problems decide which innovations/changes they should adopt" ([13] p. 396).

In the Specialist-driven strategy the most frequent recommendations again belong to the aspect Methods and techniques (9), whereas Culture (2), Processes and plans (2) and Competences and training (0) are the least common aspects allocated to the 22 recommendations. An example of a recommendation in Methods and Techniques for the Specialist-driven strategy is: "Co-ordinate, advise and manage instead of keeping control centrally" ([21] p. 39).

In the Socializing strategy the most frequent recommendations again belong to the aspect Methods and techniques (15), Culture (7) and Organizing (6), whereas Processes and plans (1) is the least common aspect allocated to the 25 recommendations. An example of a recommendation in Methods and Techniques for the Socializing strategy is: "Allow people to network and experiment with new social-work relations and power rearrangements" ([7] p. 615).

For the Commanding strategy the most frequent recommendations are allocated to the aspects Communication (7) and Methods and techniques (7), whereas Knowledge acquisition, Culture, and Competences and training are not covered at all in the 21 recommendations. An example of a recommendation on Communication for the Commanding strategy is: "Meet employees face to face and communicate your vision" ([7] p. 612).

If we look at the eight aspects one by one we observe the following (see Figure 2):

- The Communication aspect is strongly represented in the Commanding and Reengineering strategies. This appears quite natural due to the strong top management influence on the change process. The Communication aspect is almost absent in the Employee-driven, Exploration and Production-organized strategies. The first two can be explained because of the direct involvement of the actors in the target group.
- The Culture aspect is very frequent in Attitude-driven (Learning-driven) and well represented in Employee-driven and Socializing strategies. Again, this seems natural when having the nature of these strategies in mind. The Culture aspect is absent in the Commanding and Reengineering strategies. Considering

the nature of these forceful types of changes it appears quite natural that the culture of the organization is considered of less importance.

- The aspect of Competences and training is by far the most prominent aspect in recommendations for the Attitude-driven strategy. This again seems natural as teaching and learning is the focus for this strategy. The original name for this strategy was Learning-driven which also indicates this. The Competences and training aspect is absent in the Commanding and Specialist-driven strategies. Again it seems intuitively explainable. In the Commanding strategy the changes are dictated and must take place, and in the Specialist-driven strategy the relevant competences are already in place (experts).

- Decision-making is present in recommendations for all ten strategies with some variations. But there is no clear absence or strong representation for any of the ten strategies.

- Knowledge acquisition is weakly represented in all strategies, except the Measures-driven and Specialist-driven strategies. It seems quite natural that for these two strategies the acquisition and use of information is essential. For the other eight we can only observe that the authors in the change strategy literature evidently have not addressed this aspect often in their recommendations.

- The Methods and techniques aspect is very frequent in recommendations for all ten strategies. It is clearly an area that the authors of the change strategy literature find highly relevant and natural to provide recommendations for.

- The Organizing aspect is present in recommendations for all ten strategies. It is interesting that the number of recommendations for organizing is very high for the Exploration strategy. The reason for this could be that very often separate organizational units for experimentation and exploration are established.

- The aspect of Processes and plans is most common in recommendations for the Production-organized and Reengineering strategies. This seems to be quite natural having the nature of the strategies in mind. On the other hand Processes and plans are absent or very weakly represented in recommendations for the Optionality, Socializing, Employee-driven and Attitude-driven (Learning-driven) strategies. This could indicate that for strategies having a very active involvement and participation of the actors working in the setting being changed, it is not considered important to give specific recommendations on how to plan, structure and execute the change activities.

During the categorization of the individual recommendations we found many recommendations that covered more than one aspect. In total we had, as mentioned previously, 133 recommendations with a singular aspect-categorization, 91 with tuple, and 9 with a triple categorization. The main explanation for the tuple and triple categorizations is that many authors, quite naturally, provide recommendations that both cover a general statement of what is important (e.g. concerning communication, culture or decision-making) and indicate how it should be planned, organized or conducted.

It is still too early to discuss the usefulness and applicability of our eight aspects for developing concrete context-specific actions for a change. Such discussion requires further experiments where the aspects are used in specific cases when real-life changes are being planned, prepared and carried out. However, we are quite convinced that the eight aspects will function as a good checklist for management, process consultants and change agents when planning and executing changes.

In the literature we have found many indications that the eight aspects cover relevant facets and ingredients in change management. Careful consideration of the eight aspects when designing a specific action plan will therefore constitute a good platform for ensuring that all relevant facets have been addressed.

When we start using the aspects on specific real-life cases it is quite possible that we will find a need for detailing and subdividing each of the aspects further in order to provide much more advice at a level where it can be of further assistance to practitioners.

In a research context we expect the eight aspects to provide a conceptual framework for identifying and characterizing strategies, approaches and recommendations for change and change activities. The aspects might potentially be used as a set of dimensions for comparing different strategies and compare different approaches or descriptions of a specific strategy, e.g. to compare the approaches of Senge [6] and Huy [7] to the Attitude-driven strategy. For research purposes further detailing and subdividing of the aspects will probably also be required.

5.2 Methodological reflections and future research

The study presented in this paper is, of course, biased for a number of reasons. Because the work was a follow-up on the Talent@IT project, our starting point for relevant literature was [24] and [25]. Therefore a number of other relevant references were not initially considered. During the literature survey process we added literature we found relevant, but whether the starting point still biased our focus and therefore what we have addressed is unclear.

Furthermore, we are the only two persons who have 1) identified the recommendations from the literature, 2) selected the recommendations to be included in the final list for each strategy, and 3) conducted the analytic induction and abstraction leading to the eight aspects.

In our research approach we have continuously aimed at getting our findings and selections validated, but there is still a risk of a methodological weakness and a source for bias in our results. Thus, future research should aim at investigating other relevant sources for recommendations on change strategies; seek to get the aspects tested and validated on other sets of recommendations; and possibly validate whether other readers of the same literature would extract a similar set of recommendations, and select a similar set as the most important.

6 Conclusion

Based on the literature behind the ten strategies defined in ISO/IEC 33014 [3] (Table 1) we have extracted statements representing the authors' recommended actions for change for each strategy in order to develop a catalogue of these to assist the (top) management or process consultant in developing their own context-specific action plan (clause 5 step 4 in Figure 1).

During this search we discovered that the recommended actions could be grouped according to eight aspects of the change to be undertaken (Table 2). We verified this hypothesis across all the recommendations we extracted, and validated the applicability of the actions and aspects by exhibiting a number of master students to them with a confirmative result.

We also verified that the distribution of the selected actions across strategies and aspects (Figure 2) correspond to what you would expect given the nature of the literature examined (see section 5.1).

We realize that we have not included all relevant literature on change management and that the real validation of the usefulness of the aspects can only take place on real-life cases. However, we only see this as a possibility for further testing of the validity of the aspects.

Given the reservations above, we are confident of the usefulness of the aspects we have found. We firmly believe that when planning and executing changes in your specific context / case, you should carefully consider these eight aspects (Table 2) when developing your action plan and accompanying list of recommended actions.

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