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Eight Aspects of Actions in Improvement Plans

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Abstract. Process improvement planning and managing changes in general are highly complex and demanding activities. To establish an overview of recommended actions in such plans, we performed a thorough study of a comprehensive set of change strategy literature. For each author we extracted their main recommendations for action. The result was a list of recommendations for action containing 233 recommendations. Through analytic induction we identified eight generic aspects that managers, process consultants and change agents should consider when planning and executing changes and process improvements. In this paper we present and discuss the eight aspects. We provide some reflections on how these aspects could be used for inspiration, or as checklists, when designing action plans in practical change management situations. Finally, we relate the eight aspects to the values and principles in the SPI Manifesto and the guidelines for process improvement in ISO/IEC 33014.

Keywords: action plans; aspects of change; change strategies; ISO/IEC 33014; process improvement; SPI Manifesto.

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.

Our research interest has been to address (part of) this issue by examining which recommendations can be extracted from the existing change management literature and investigate the applicability of these as advice for those planning and executing a change. To do so, we have performed a thorough study of the literature that is the foundation for the 10 overall change strategies defined in ISO/IEC 33014 [3]. We have extracted statements from this material that represent recommended actions to support a change. We have primarily focused on the (top) management perspective.

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During this process we have identified and validated 8 aspects that can be seen as overall headings or categories for the actions. The aspects thereby reflect our aggregation of what a series of prominent authors consider essential. The eight aspects are listed in Table 1 and described in detail in section 4.

The work on arriving at the 8 aspects and how they are related to the 10 overall change strategies in ISO/IEC 33014 has been reported in Carstensen and Vinter (2017) [4]. We believe that these 8 aspects can be supportive for the management, process consultant or change agent when developing and executing a specific action plan for a change in a particular context. We have described our suggested way of doing so in Carstensen and Vinter (2018) [5].

The aim of this paper is first to describe and exemplify the 8 aspects further, and then to reflect upon the applicability and coverage of the aspects in a specific change context, namely that of software process improvement (SPI).

To do so, we first set the stage by mentioning what others have done with respect to defining frameworks similar to our aspects for change (section 2). Then follows a brief presentation of our process of extracting relevant recommended actions from the change management literature and how we arrived at identifying the eight aspects (section 3). Details of this process can be found in [4].

We then present each of the aspects in detail in section 4, and in order to put our work into a specific SPI context of change, we relate the aspects to the 3 values and 10 principles in the SPI Manifesto [6] (section 5) and briefly also to the Guidelines for process improvement in ISO/IEC 33014.

Finally we reflect over some potential biases and discuss the usability of the aspects in practice (section 6).

2 What Have Others Done

There is a huge body 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 [7]; Hammer and Champy arguing for reengineering the whole corporation [8]; Mintzberg's overall conceptual frameworks for understanding and changing different organization structures [9]; Rogers' deep analyses of adoption and diffusion of changes [10]; Senge's approach to change organizations through socializing and learning [11]; and Huy focusing on structuring and sequencing of strategies over time [12]. 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, especially within the area of process improvement. In addition, the SPI Manifesto [6] presents a set of values and principles specifically for the SPI context.

In his influential book on strategy safaris [13] 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 10 distinct schools might be

supportive for characterizing a specific change process or categorizing an approach or methodology.

Balogun and her co-authors [14] [15] 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; 8 essential features of the change context (time, scope, preservation, diversity, capability, capacity, readiness, and power); and 6 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, for example strategy+business that provides 10 principles for leading change management [16] focusing on culture, how to involve all layers in the organization, how to engage and lead etc.

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. To our knowledge, however, very few attempts have been made to define 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. We believe that our 8 aspects represent such a framework and will describe the aspects in details in section 4.

3 Our Research Approach

Our research approach is based on analytic induction. We began by extracting recommended actions from the literature behind 2 of the 10 ISO/IEC 33014 [3] strategies. 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" ([12] 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 8 such aspects and then hypothesized that these 8 aspects would be applicable also to the recommendations for the remaining 8 strategies. We discussed each aspect and defined them properly.

We quickly realized that the aspects were not completely orthogonal, which was never our intention. 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 8 aspects are listed in Table 1.

To validate the hypothesis we repeated the same process for the rest of the 10 strategies defined in ISO/IEC 33014 [3]. 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 confirmed our hypothesis. We performed other types of validations too, the details of which can be found in [4].

4 The Eight Aspects to Be Considered in a Change Plan

The approach mentioned in the previous section involved a careful review of in total 32 books and articles. This review identified 665 recommendations for action when organizing and carrying out strategic changes. This number was later refined to 233 recommendations that were the most clearly indicative of the strategies. Through analytic induction we identified 8 generic aspects that managers, process consultants and change agents need to consider when planning and executing changes. An overview of the aspects is presented in Table 1.

Table 1. The 8 aspects of recommended actions for executing a change.

Aspect	Short explanation
Communication	Types of information that should be communicated, to/by whom, when/through which channels.
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.
Culture	The culture that should be established / changed / supported in the organization to secure the success.
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.
Knowledge acquisition	The knowledge that should be obtained / gained / collected before and during the work on the change.
Methods and techniques	Concrete methods and techniques that should be used in order to execute the change.
Organizing	How the change-team as well as all involved or affected by it should be organized / structured.
Processes and plans	Concrete plans and processes that management and change-team establish for the work.

The 8 aspects cover all the central themes that should be considered and included in a change plan. Some aspects cover how the work should be planned and undertaken i.e. Plans and Processes, and Methods and Techniques.

Other aspects have to do with ensuring that the relevant information is collected, how the work should be organized and how decisions should be made – ahead of the

actual change activities as well as while the change is being undertaken i.e. Knowledge acquisition, Organizing and Decision-making.

Finally some aspects have to do with the people involved in the actual change: Culture, Communication, and Competences and Training.

In the rest of this section each of the 8 aspects will be described in detail. First we present a definition of the aspect, then some example recommendations from literature, and finally some reflections over the distribution across the overall change strategies.

4.1 Communication

Definition: About the types of information that should be communicated, to whom, by whom, when and through which channels. This includes documents and artefacts required for supporting and evaluating the change.

Example recommendations from literature:

- “Promote communication between communities of practice” ([17] p. 69).
- “Meet employees face to face and communicate your vision” ([12] p. 612).
- “Communicate often and focus on the opportunities” ([18] p. 6).
- “Develop and publish clear documented corporate beliefs and purpose - a mission statement” ([19] p. 36).

The Communication aspect is not evenly distributed over the 10 overall change strategies in the ISO/IEC 33014 standard. Communication issues are mentioned most often when a strategy of dictating change or reengineering the processes or structures in the organization is adopted. The vision must be clear, shared and reinforced often.

In cases of more exploratory or employee-driven changes communication is performed more informally and therefore not mentioned often by the authors.

4.2 Competences and Training

Definition: About 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, as well as competences and education / training that should be established for the parts of the organization included in the change.

Example recommendations from literature:

- “Ensure that the local adopters are sufficiently educated / trained to understand the big picture about the available innovation/change” ([10] p. 399).
- “Train change agents to become competent in interpersonal inquiry” ([12] p. 608).
- “Develop leadership skills among middle managers to install new values in them” ([12] p. 620).

Most authors addressing the Competences and training aspect focus on changes involving the attitude of employees and learning organizations. The aspect is also mentioned for types of changes with particular emphasis on developing the

competences of the persons driving the change, like change agents, middle managers or selected groups in the target audience.

For changes in highly specialized organizations this aspect is ignored in the literature, presumably because the competences are expected to be present already.

4.3 Culture

Definition: About the culture, that should be established / changed and supported in the organization in order to secure the success of the desired change. It could be directed at the whole (or specific parts of the) organization, including management, the change-team as well as the parts of the organization included in the change.

Example recommendations from literature:

- “Engage in recurrent rituals to build shared meanings” ([12] p. 608).
- “Encourage people to challenge and examine alternatives” ([12] p. 619).
- “Encourage individuals to establish improvement goals for themselves and their groups” ([19] p. 19).

This aspect is often mentioned by authors dealing with changes in attitude of the employees or organizational learning, and also in cases of changes involving relational coordination, and changes taking place through social networks. The focus of the recommendations is on creating situations where the employees can open up for new changes in their environment e.g. through discussion fora where current practices (culture) are questioned and improved.

The Culture aspect is not addressed in the literature where dictating change or reengineering the processes or structures in the organization is the goal.

4.4 Decision-making

Definition: About the types of 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, they can be made; specifically the delegation of authority.

Example recommendations from literature:

- “Shift power to the experts (specialists) by virtue of their knowledge” ([9] p. 106).
- “Enable the diffusion and adoption of the change by making alternatives clear” ([10] p. 6).
- “Base your management decisions on a long term philosophy, even at the expense of short term financial goals” ([20] p. 5).

The number of recommendations associated with this aspect is relatively uniformly distributed across the 10 overall strategies in ISO/IEC 33014. This seems natural as all types of change must establish some form of clarity about how decisions should take place e.g. who is responsible for what, and what authoritative power is distributed to different layers or persons in the organization.

The approach to how decision-making is defined, however, differs among the overall strategies. The more dictating strategies recommend maintaining the power of

authority at the top of the organization, whereas other strategies where the participation of employees is desired, authoritative power is distributed more widely e.g. to change agents.

4.5 Knowledge Acquisition

Definition: About the types of knowledge, that should be obtained / gained / collected before and during the work on the change. This could comprise knowledge about the preconditions for the change, or clarification of the specific conditions about the (part of the) organization that should undergo the change. Also knowledge on whether the activities seem to have had the expected effects and whether it might be relevant to consider changing the strategies applied.

Example recommendations from literature:

- “Study norms and conventions that provide the implicit context for performing practices” ([17] p. 23).
- “Ensure that the impact of existing initiatives are evaluated and considered carefully before starting another series of improvement initiatives” ([19] p. 159).
- “Analyze constraints and evaluate specifications” ([21] p. 189).

Strangely enough this aspect is not very well addressed by the authors when it comes to giving recommendations for action. It seems as if most authors have fixed their minds on executing a change and therefore do not address the prerequisites and context that defined the change in the first place. Nor do the authors seem to take much interest in giving recommendations on how to collect and use feedback from the organization as the change activities are progressing.

Except for changes in highly specialized organizations, the majority of the 10 overall change strategies in ISO/IEC 33014 have less than 3 recommendations given by the authors.

4.6 Methods and Techniques

Definition: About the concrete methods and techniques, that should be used in order to execute the change. How they should be performed and by whom.

Example recommendations from literature:

- “Co-ordinate, advise and manage instead of keeping control centrally” ([17] p. 39).
- “Set the stage, step back a bit, allow patterns to emerge, and determine which ones are desirable” ([12] p. 615).
- “Forget the past, break rules and traditions in order to create variation” ([22] p. 251).

This aspect is by far the most popular when it comes to giving recommendations, and the recommendations are evenly distributed over the 10 overall strategies in ISO/IEC 33014. The recommendations cover a wide set of issues and are at several levels of abstraction.

We have asked ourselves whether this aspect should be split in two or more aspects, but we have not yet been able to find a good division and relevant definitions for such aspects.

4.7 Organizing

Definition: About the organizing of the change. How the team responsible for the change as well as all involved in it or affected by it should be structured, their roles in the change defined, and which groups and fora should be formed.

Example recommendations from literature:

- “Ensure that leadership of the change belongs to one small group of people typically located at the top of the hierarchy” ([12] p. 605).
- “Establish and cultivate communities of practice” ([17] p. 22).
- “Form quality improvement teams with representatives from each department” ([19] p. 19).

The number of recommendations from the literature is relatively uniformly distributed across the 10 overall strategies in ISO/IEC 33014. This seems natural as all types of change must establish some form of clarity about how a change should be organized.

It is noticeable, however, that the number of recommendations dealing with exploratory changes is much higher than for other types of changes and this may be because the authors want to emphasize that such activities must be organized separately from the normal operations in the organization.

4.8 Processes and Plans

Definition: About the concrete plans and processes that management and change-team establish for the execution of the whole and/or specific parts of the work.

Example recommendations from literature:

- “Overhaul processes which create a vicious cycle of overload, stress, burnout and low morale” ([12] p. 612).
- “Use comprehensive strategic planning including competitive analysis and portfolio management” ([12] p. 604).
- “Ensure control at all stages of planning and operationalization of the strategy” ([13] p. 55).

We had expected that change management authors would present many recommendations about which processes and planning was needed for executing a change. But the aspect received fewer recommendations than many other aspects e.g. Methods and Techniques.

Recommendations for this aspect are most often given for changes aimed at optimizing operations or restructuring the organization using quantitative measurements as drivers.

Only few recommendations are presented for changes where the employees are the prime drivers or mediators in the change.

5 The Aspects in Relation to Software Process Improvement

As mentioned previously the 8 aspects we have identified are to some extent recognizable in many authors' recommendations and reflections on 'general' issues to consider when planning and executing change activities.

In this section we focus on the 8 aspects in relation to a prominent process improvement framework: The SPI Manifesto [6]. Hereby we can evaluate the coverage of the aspects in a software process improvement (SPI) context and vice versa.

The SPI Manifesto states that SPI is based on 3 values: People, Business and Change. These values are supported by 10 principles ([6] p. 1). The People value is supported by 4 principles. The Business value and Change value are supported by 3 principles each.

The People value states: "We truly believe SPI must involve people actively and affect their daily activities" ([6] p. 3). This means increasing the competitiveness through the knowledge and active involvement of people in improvement actions. When we look into the recommendations associated with the two aspects: Culture, and Competences and training, we find a number of recommendations that address the active involvement of people as well as providing the involved people with sufficient and relevant competences and training. Other aspects like: Communication, Decision-making and Methods and Techniques also contain recommendations addressing this value.

The Business value states: "We truly believe that SPI is what you do to make business successful" ([6] p. 4). This means that the processes you improve must fit the needs of your business. Many of the recommendations associated with the aspects focus on setting and communicating goals for the change that are dictated by the needs of the business; typically reflected in the aspects: Communication, Knowledge acquisition, Methods and techniques, and Processes and plans.

The Change value states: "We truly believe that SPI is inherently linked with change" ([6] p. 5). This means that accepting and adopting change throughout the organization is essential. As a consequence the organization must ensure that its infrastructure has a change management component in it. This aligns with the recommendations associated with the aspects: Culture, Organizing, Methods and techniques, and Processes and plans.

We therefore claim that there is – not surprisingly – a fine compliance between the core values in the SPI Manifesto and the recommendations associated with the eight aspects.

In order to fully relate the SPI Manifesto to our aspects our approach has been to treat the document as we previously did in our literature review. We carefully read the text, extracted recommendations and assigned them to aspects.

We found that the most common aspect in recommendations across the SPI Manifesto is: Methods and techniques. This result is common for all the literature we have reviewed. However, we also found that the aspects: Decision-making and Organizing were assigned to only 1 recommendation each, which is not the case for the general literature on change. We think that this issue represents a weakness in the SPI Manifesto.

If we only look at the 10 principles and their meaning (i.e. not the full text) and relate them to the aspects, we get the result shown in Table 2.

Table 2. The 10 SPI Manifesto principles and related aspects.

Manifesto principles	Related aspects
1. Know the culture and focus on needs	Culture, Knowledge acquisition
2. Motivate all people involved	Culture
3. Base improvement on experience and measurements	Competences and training, Culture
4. Create a learning organization	Culture, Competences and training
5. Support the organization's vision and objectives	Methods and techniques, Processes and plans
6. Use dynamic and adaptable models as needed	Methods and techniques, Knowledge acquisition
7. Apply risk management	Methods and techniques
8. Manage the organizational change in your improvement effort	Processes and plans, Methods and techniques
9. Ensure all parties understand and agree on process	Communication
10. Do not lose focus	Methods and techniques, Processes and plans

In Table 2 we observe that the Culture aspect is very much present in the People value principles (1-4). The aspect of Competences and training is also common, but we also observe that the principles focus more on using and including the actors' experiences, not so much on the establishment of new competences.

The principles associated with the Business value (5-7) and Change value (8-10) are dominated by the aspects: Methods and techniques and Processes and plans, which was to be expected.

From the above it is clear that the principles can be related to the aspects and vice versa. This is not very surprising as the literature and sources of inspiration to a large extent are the same.

But we also observe that the aspects: Communication, Decision-making, and Organizing are not as frequently represented as in the other literature we have reviewed. Again this is not very surprising as the basis for our aspects is the general change management literature which is broader and covers more than recommendations for software process improvement.

On the other side we found that business-related recommendations in the Manifesto like "process improvement goals must reflect business goals" were all assigned to the aspect: Methods and techniques. Separating such recommendations from the Methods and techniques aspect should be considered by us in the future.

We have performed a similar analysis of the Guidelines for Process Improvement in the ISO 33014 standard. Space limitations, however, prevent us from giving a full review here. Suffice to say, that the standard also gives few recommendations for the

Decision-making aspect. For the aspects of Communication, Culture, and Competences and training few recommendations are presented also.

6 Conclusion

This paper has presented 8 aspects that, together, establish a set of areas that needs to be addressed in change activities, both with respect to management, planning and carrying out the actual change activities. Based on the literature behind the 10 strategies defined in ISO/IEC 33014 [3] we extracted statements representing the authors' recommended actions for change and from this synthesized the 8 aspects presented here (section 4).

To demonstrate the relevance of the 8 aspects in a software process improvement context we have compared them with the values and principles in the SPI Manifesto [6]. This showed that the SPI Manifesto contains recommendations for all of the 8 aspects, although the aspects of Communication, Organizing and Decision-making have only a very limited representation compared to the general change management literature. This could call for further investigations into whether this is due to the nature of the SPI Manifesto (focusing very much on values and opinions), or whether the SPI Manifesto could be improved if these aspects were more explicitly incorporated.

We are aware that our research into the change management literature has some methodological weaknesses which mean that the validity and the applicability of the aspects should be investigated further. E.g. we realize that we have not included all relevant literature on change management and process improvement. It is furthermore quite obvious that further validation of the usefulness of the aspects can only take place on real-life cases. A third issue has to do with the fact that 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 8 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.

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 and case, you should carefully consider the aspects when developing your action plan. In the literature we have found many indications that the 8 aspects cover relevant facets and ingredients in change management and process improvement. Careful consideration of the 8 aspects when designing a specific action plan will therefore constitute a good platform for ensuring that all relevant facets have been addressed.

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