Software process improvement strategy

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SOFTWARE PROCESS IMPROVEMENT STRATEGY

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Abstract

Software Process Improvement (SPI) has been around within the software industry for a while. Many organisations have been practicing SPI following different appraisal models focusing on different maturity levels aiming to change the practice of their software work. Getting success in SPI has shown to be a difficult challenge for many organisations. This paper argues that an SPI effort should be viewed as a change programme rather than a process improvement effort. In this way one important aspect in succeeding in making change happen in reality is having a clear SPI Strategy. This paper describes what strategy means in the light of SPI and what an effective SPI strategy should address.

Keywords: Software Process Improvement, Strategy, Change.

1 SOFTWARE PROCESS IMPROVEMENT (SPI)

Software Process Improvement (SPI) was developed by the Software Engineering Institute (SEI), inspired by the work of Watts Humphrey (Humphrey 1989). SPI has influenced the software industry during the last number of years in changing focus from fighting fire to systematic approach in improving processes of software work. A traditional SPI effort starts with an assessment to establish the current maturity level of the software organisation. It often follows a road map used by a maturity model like the Capability Maturity Model (CMM) (see Paulk et al. 1993). In order to improve the capability of the organisation further efforts should be organised and planed based on the organisation’s requirements and practitioners’ ideas. After conducting software process improvement activities, the main challenge for an organisation is to implement the newly created software processes into the entire organisation to become part of practitioners’ daily work.

An SPI initiative is cyclic in nature and includes different phases 1) Initiating, 2) Diagnosing, 3) Establishing, 4) Acting and 5) Learning as expressed in the IDEAL model (McFeeley 1996). In the initiating phase preparations are made to carry out the SPI effort. It includes plans, schedules, and infrastructure. The next step is devoted to diagnosing the current maturity level of the organisation’s software processes. This information will become the basis for focused improvement projects in the next step. Each project creates new or enhanced software processes, which are verified and eventually implemented in the whole organisation to improve the software engineering practices. The final phase is focused on continued improvement, including measurements of the newly created software processes and documenting lessons learned from the SPI efforts (McFeeley 1996, Zahran 1998).

Many organisations have been inspired by the concept of SPI and started SPI initiatives. Achieving success with SPI has however proven to be a difficult challenge. Many organisations do not succeed in their improvement activities and others have problems with the implementation of new processes in the organisation (Tryde et al. 2000). Different factors such as scaling the SPI initiative, setting realistic goals, coping with the complexity of organisational changes, and dealing with the organisational culture have made it hard to achieve success in SPI initiatives (Goldenson and Herbsleb 1995, Herbsleb et al. 1997, Mashiko and Basiili 1997, Johansen and Mathiassen 1998).
A large body of knowledge about SPI has become available in recent years, including specific models (Paulk et al. 1993, Kuvaja 1994), concepts to support practical use of the models (McFeeley 1996, Zahran 1998), experience reports (Goldenson and Herbsleb 1995, Johansen and Mathiassen 1998), and critical evaluations (Curtis 1994). A survey of SPI literature and a list of the key ideas in SPI are presented by Aaen et al. (2001). They provide a conceptual map that describes three fundamental aspects of SPI defined through nine elementary ideas. According to the authors, SPI is based on these ideas, which offer specific answers to specific concerns.

According to Aaen et al. (2001), the management of SPI initiatives builds on three ideas: 1) the SPI activities are organised as dedicated efforts, 2) all improvement efforts are carefully planned, and 3) feedback on effects on software engineering practices is ensured. The approach to SPI initiatives is guided by three additional ideas: 1) SPI is evolutionary in nature, 2) SPI is based on idealised, normative models of software engineering, and 3) SPI is based on a careful creation and development of commitment between the actors involved. Finally, the perspective on the SPI target is dominated by three ideas: 1) SPI is focused on software processes, 2) the practitioners’ competencies are seen as the key resources, and 3) SPI aims at changing the context of the software operation to create sustainable support for the actors involved.

Implementing newly created software processes in an organisation is a matter of changing the current way of working and bringing about a new way. The management of change is of critical importance for the success of implementing new software processes in an organisation. One of the main reasons for its criticality is that it involves a wide spectrum of domains that may need to be changed, such as: cultural, behavioural, organisational, technological, and environmental changes. Therefore having a change strategy which is clearly defined, agreed, accepted and communicated is essential for a successful SPI change processes.

On the basis of change management theories using a strategy framework based on (Mintzberg et al. 1998) this paper analysis SPI efforts from a strategy perspective. This attempt is trying to find answers to two main questions: What is an SPI Strategy? And What should it address?

The section below presents the research approach. Section 3 presents the change management theory. Section 4 describes the strategy framework. Section 5 discusses the theoretical interpretation, and section 6 concludes the paper by presenting the conclusion.

2    RESEARCH APPROACH

This study is based on literature studies on the areas of SPI, change management and strategy and author’s personal experiences as manager of several SPI efforts in industry (see Pourkomeylian 2002, Priese Heje, J.& Pourkomeylian P. (2004)). In this study the SPI literature has been reviewed in the light of literature from organisational change management and strategy processes. Further I’ve viewed SPI in the context of strategy processes and have taken some guiding principles for how to develop an effective SPI strategy.

3    THE CHANGE MANAGEMENT APPROACH

According to Burnes (1992) it is shown that change management theories can be distinguished by their respective concentration on individual, group and organisation wide issues. These levels have been in focus in the SPI literature through “institutionalisation” of software process implementation (see Zahran 1998). According to Burnes (1992) and Weinberg (1997) change comes in many shapes and sizes, though most forms can be categorised as either radical or incremental. Radical change often relates to large-scale, organisation wide change programmes involving the rapid and wholesale overturning of old ways and old ideas and their replacement with new and unique ones. Radical change is however characterised by its speed, scale and break with the past. On the other hand, an
incremental change process can only bring an ad hoc, local improvement in performance (Burnes 1992). It is clear that changing, even in a small way, can be complex and difficult. The literature abounds with examples of changes that have gone wrong, some disastrously so (Burnes and Weckes 1989), (Cummings and Huse 1989), (Kanter 1989), and (Kelly 1982).

One main reason for not succeeding in implementing change in organisations has been the factor of resistance to change. The instinctive human reaction to change is usually a rejection of the new change and preference for the status quo. This rejection may cause problems in implementing change in organisations (Zahran 1998), (Weinberg 1997) (Beer 1987), and (Jacobsen and Thorsvik 1998). Our experience tells us that, because of the rejection of change and for other reasons, many process improvement activities do not lead to a full institutionalisation of the new processes in the organisation. Practitioners’ resistance to change can have different reasons. Jacobsen and Thorsvik (1989) mentioned some factors that can cause resistance to change, such as: Expectations: a change in the working processes fails to satisfy practitioners’ expectation; New knowledge: implementing the newly created processes in the organisation might require individuals to have new knowledge; Risks and insecurity: using the new processes can bring risks and lead to the creation of an insecure environment in the organisation; Power: changing from one way of working to another might change the stable power and influence balance in the organisation and therefore cause resistance to change. Other reasons for resistance to change might be: Wrong process level: the level of the software processes is not suitable to the situation (they are too complex or too simple); Not being involved in the improvement process: the new processes have just come from the top and non of the practitioners has been involved in the improvement activities; Bad timing: the implementation time is not suitable, practitioners have no time to become involved in a change process; Lack of supporting infrastructure: lack of a support for the practical implementation of the processes in the organisation.

According to Collins (1998) change models may generally be viewed into two broad categories, under-socialised (n-step models) and over-socialised models. The n-step models are descended from functional point of view where change is occurred through some rationalistic and planned steps. A general view on these types of models has been described by Hall (1997) through which, standard methodologies for change includes the following stages: 1) identifying the problem, 2) generate possible solutions 3) select the proffered solution, 4) implement change, and 5) monitor change. Over-socialised models have a more interpretative view where goals should be clarified, communicated and understood by people.

Weinberg (1997) takes a similar approach in classifying different change models: 1) the diffusion model, 2) The hole-in-the-floor model, 3) the Newtonian model, and 4) the learning curve model.

### 3.1 The Diffusion Model

This model advocates ad hoc changes that just happen without any specific management control. This model sees change as a mysterious and “force of nature” process. According to this view, in many instances, a change seems to come about throughout an organisation without any specific management action (no planning and no control, change just happens when it happens). The strength of this model is its attention to change as a process. The weakness of the model is the abdication of control over that process to a passive, mysterious “force of nature”.

### 3.2 The Hole-in-the-Floor Model

The Hole-in-the-Floor, or expert based model attempts to correct the weakness of the Diffusion Model by adding control to the change process. According to this view experts develop the “perfect” solutions and the change plan consists of “drilling a hole in the floor”. The new solutions will then be “dropped” through the hole with the intent that practitioners will use it happily ever after. The difference between this model and the Diffusion Model is that change happens if and only if all preparations are correct. This model is often proffered by experts who believe that organisations
behave logically i.e. that everyone will undoubtedly recognise the benefits of their proposal to change, immediately accept the proposed change and be willing to change the way they work. Its strength of this model is the emphasis on planning. Its weakness is that the planning leaves out many essential factors, most notably the human factor.

3.3 The Newtonian Model

The Newtonian model introduces the human factor into the hole-in-the-floor model. This model predicts that change happens faster when you push harder. The larger the system you want to change, the harder you must push. Likewise the faster the change you want, the harder you must push. Force and acceleration are two factors that have directions. The model thus implies that, to change in a certain direction, you must push in that direction. According to this model, what is missing in the hole-in-the-floor model is the push. In this respect the model does recognise that people have a choice in what they do and that their choice can be influenced (by pushing them) as part of the change process. Typical pushes include offering bonuses, threatening loss of jobs, or rewarding with challenging assignments. But one should remember that push works both ways. Many changes are set up to fail because the force pushing for them is overbalanced by other forces that push against them. The strength of this model is the explicit introduction of the human element in the form of motivation. The weakness is the totally inadequate model of humanity that’s used: that people can be pushed around like billiard balls.

3.4 The Learning Curve Model

It has been observed that people are not usually able to respond with instant efficiency when change is first introduced. Moreover, once they do respond, it takes time to learn to respond as well as the planners would hope and thus to realise the intended benefits of the change. This model predicts that change occurs along a curve characteristic of the people making the change. The curve is obtained by averaging performance over many individuals and thus may smooth out significant individual variations. The model says that all changes follow some sort of learning curve. Moreover, the actual values of the curve are affected by a number of psychological factors, such as relevant skill, motivation, and aptitude. This suggests the possibility of influencing the course of the change by personnel selection and training, which certainly represents a set-up in realism as in the Newtonian Model. This model is quite useful for predicting the time scale of large-scale change but it does not go far enough as a practical tool for managing change person-by-person in a real organisation. The strength of the model is its incorporation of the adaptive human element in change. The weakness is the averaging out of details of individual human beings.

4 STRATEGY

According to Burnes (1992) it is commonly argued that the concept of strategy has been passed down to us from the ancient Greeks. Bracker (1980) means that the word strategy comes from the Greek stratego meaning to plan the destruction of one’s enemies through the effective use of resources. However, the Greeks developed the strategy concept using in victory in war. The concept remained a military one until the Industrial Revolution when it began to permeate the business world (Bracker, 1980, Chandler 1962). The military influenced discussions around strategy must surely be among the oldest continuous literatures in the world. According to Mintzberg et al. (1998) the origin of the word “strategy” go back even further than this experience in Macedonia, to Greeks whom Alexander and his father defeated. A strategy according to Mintzberg et al. (1998) is the pattern or plan that integrates an organisation’s major goals, policies and action sequences into cohesive whole. A well-formulated strategy helps to allocate an organisation’s resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment and contingent moves by intelligent opponents. Mintzberg et al. (1998) focused further on various distinct
definitions of strategy – as plan (as well as ploy), pattern, position, and perspective. They use the first two of these definitions to take the focus beyond deliberate strategy – beyond the traditional views of the term to the notion of emergent strategy. This introduces the idea that strategies can form in an organisation without being consciously intended that is without being formulated.

4.1 Dimensions of strategy

Mintzberg et al. (1998) describe five dimensions focused on the nature and design of formal strategies:

1) **Goal development**: effective formal strategies includes three essential elements: 1) the most important goals to be achieved, 2) the most significant policies guiding or limiting actions, and 3) the major action sequences that are to accomplish the defined goals within the limits set.

2) **Develop key concepts**: effective strategies develop around a few key concepts, which give them cohesion, balance and focus. Some are temporary, others are carried through the end of the strategy, ex: resources must be allocated in patterns that provide sufficient resources for each concept to succeed regardless of its relative cost/gain ratio.

3) **Build a strong posture** that helps the organisation to achieve its goals despite the unforeseeable ways external forces may actually interact when the time comes. A strategy deals not just with the unpredictable but also with the unknowable.

4) **Having a number of hierarchically related and mutually supporting strategies** for complex organisations. Each strategy must be shaped as a cohesive element of higher level strategies. It is important that there should be a systematic means for testing each component strategy and seeing that it fulfils the major tenets of well-formed strategy.

4.2 Criteria for effective strategy

Tilles (1963) and Christensen et al. (1978) suggested some initial criteria for evaluating a strategy. These include its clarity, motivational impact, internal consistency, compatibility with the environment, appropriateness in light of resources, degree of risk, match to the personal values of key figures, time horizon and workability. Mintzberg et al. (1998) further this focus and add key questions for seven critical elements of strategy that can applied in business, government or warfare. See table 1:

<table>
<thead>
<tr>
<th>No</th>
<th>The Critical Elements</th>
<th>The Key Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clear, decisive objectives</td>
<td>Are all efforts directed towards clearly understood, decisive and attainable overall goals?</td>
</tr>
<tr>
<td>2</td>
<td>Maintaining the initiative</td>
<td>Does the strategy preserve freedom of action and enhance commitment?</td>
</tr>
<tr>
<td>3</td>
<td>Concentration</td>
<td>Does the strategy concentrate superior power at the place and time likely to the decisive?</td>
</tr>
<tr>
<td>4</td>
<td>Flexibility</td>
<td>Has the strategy purposely built in resource buffers and dimensions for flexibility and manoeuvre?</td>
</tr>
<tr>
<td>5</td>
<td>Coordinated and committed leadership</td>
<td>Does the strategy provide responsible, committed leadership for each of its major goals?</td>
</tr>
<tr>
<td>6</td>
<td>Surprise</td>
<td>Has the strategy made use of speed, secrecy and intelligence to attack exposed or unprepared opponents at unexpected times?</td>
</tr>
<tr>
<td>7</td>
<td>Security</td>
<td>Does the strategy secure resources based and all vital operating points for the enterprise?</td>
</tr>
</tbody>
</table>
Table 1. Criteria for effective strategy

4.3 Strategy levels

In order to reducing the confusion of how to adopt a specific strategy for organisations Burns (1992) categorises strategies in three: 1) Corporate level: in this level strategy deals with plans for managing diversified enterprises whose activities cut cross several lines of business. 2) Business level: in this level strategy relates to the operation and direction of each of the individual businesses within a group of companies. 3) Functional level: in this level strategy concerns individual business functions such as R&D, manufacturing or distribution.

Each of the levels, though they are interrelated, has its own distinct strategic concerns and each can draw on a different battery of strategic weapons, or types, to aid them, although there are strategies at the corporate level, which have their counterparts at the business level, and likewise at the functional level. The following table illustrates some important question to be addressed:

<table>
<thead>
<tr>
<th>No.</th>
<th>Strategy level</th>
<th>Questions to be addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Corporate level</td>
<td>What is the mission of the organisation?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How should the business portfolio be managed?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What existing business should be divested and which new ones acquired?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What priority and role should be given to each of the business in the current portfolio?</td>
</tr>
<tr>
<td>2</td>
<td>Business level</td>
<td>How should the firm position itself to compete in distinct, identifiable and strategically relevant markets?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Which types of product it offer to which groups of customers?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How should the firm structure and manage the internal aspects of the business in support of its chosen competitive approach?</td>
</tr>
<tr>
<td>3</td>
<td>Functional level</td>
<td>How can the strategies formulated at the corporate and business levels be translated into concrete operational terms in such a way that the individual organisational functions can pursue and achieve them?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How should the individual functions of the business organise themselves in order not only to achieve their own aims, but also to ensure that they integrate with the other functions to create synergy?</td>
</tr>
</tbody>
</table>

Table 2. Strategy levels

4.4 Five Ps for strategy

Instead of giving one single definition of what strategy is Mintzberg et al. (1998) choose to offer a multiple definition of strategy hoping that it can help people to manoeuvre through this difficult field. According to their understanding strategy can be defined in five ways as:

1) **Plan**: to almost anyone, strategy is somehow connected to plans, to some sort of consciously intended course of action, a guideline a path to deal with a situation. In military: strategy is concerned with drafting the plan of war. In Game theory, strategy is a complete plan which specifies what choices the player will make in every possible situation. In management, strategy is a unified, comprehensive, and integrated plan, designed to ensure that the basic objectives of the enterprise are achieved. As plans, strategies may be general or they can be specific.
2) **Ploy:** As plan, a strategy can be a ploy, too, really just a specific “manoeuvre” intended to outwit an opponent or competitor.

3) **Pattern:** in order to be able to realise strategies as plans we need to approach them as patterns. Strategy is a pattern specially, a pattern in a stream of actions. The definitions of strategy as plan and pattern can be quite independent of each other: plans may go unrealised, while patterns may appear without preconception. If we label the first definition intended strategy and the second realised strategy, then we can distinguish deliberate strategies, where intentions that existed previously were realised, from emergent strategies, where patterns developed in the absence of intentions, or despite them. For strategy to be truly deliberate that is, for a pattern to have been intended exactly as realised would seem to be a tall order. Precise intentions would have had to be stated in advance by leadership of the organisation, these would had to be accepted as is by people, and then realised with no interference by market, technological or political forces, and so. Likewise, a truly emergent strategy is again a tall order, requiring consistency in action without any hint of intention.

4) **Position:** strategy as a position is specially a means of locating an organisation in an environment. By this definition, strategy becomes the mediating force or “match” between the internal and the external context. Defining strategy as a position can be compatible with either (or all) of the preceding ones: a position can be pre-selected and aspired to through a plan (or ploy) and/or it can be reached, perhaps even found, through a pattern of behaviour.

5) **Perspective:** A strategy as perspective looks inside the organisation, indeed inside the heads of collective strategist, but up to a broader view. Here, strategy is a perspective, its content consisting not just of a chosen position, but of an ingrained way of perceiving the world. Strategy in this respect is to the organisation what personality is to the individual.

5 **THEORETICAL INTERPRETATIONS**

Approaching SPI from a change point of view makes it clear that an SPI effort has the main characteristic features of a change process, through which the practice of software work is object for change. In this context the focus of improvements should be moved from “process” to “practice” and the improvement efforts should be organised as a change programme rather than a process improvement project. In this sense, in an SPI programme more attention and focus will be on defining expected effects, planning, organising and managing changing behaviours and knowledge rather than only improving processes.

Having the MAP framework in focus (Aaen *et al.* 2001) we realise that an SPI effort in itself is an organised and planned effort which is based on gathering feedback about the processes from the field of practices. SPI can further be seen as an incremental based change process (see Burnes 1992 and Weinberg 1997) rather than a revolutionary one. An SPI effort doesn’t happen in an ad-hoc way (see Weinberg 1997). It is not an expert oriented effort, it is rather based on practitioners’ ideas and ideals. SPI should not be forced/pushed into the organisation (see Weinberg 1997). The change process in SPI is a combination of stepwise, planned, organised and controlled effort that is built based on practitioners’ commitment and ideas (see Weinberg 1997, Aaen *et al.* 2001). But, still in SPI literatures there is a lot of focus on processes and very little on change strategy (Paulk *et al.* 1993, Humphrey 1989, Humphrey *et al.* 1991)).

A typical SPI effort starts with an assessment (often a CMM-based) to establish the current maturity level of the organisation. Here the focus is on establishing the maturity level of the software processes in the organisation. Approaching SPI as a change programme requires additional assessment to find out the maturity level of peoples’ disposition to change in order to understand and establish the maturity of peoples’ ability, willingness and openness to change. People in all levels: management, project managers, and software engineering staff (Pourkomeylian 2001).
Next step in an SPI effort is focused on identifying which processes to improve, when to do what and assigning people to the different process improvement tasks needed to be done. This effort will be structured through an SPI plan which shows the detail of the SPI project (McFeeley 1996). An SPI effort on the other hand is a knowledge creator mechanism through which knowledge will be captured, modified and transferred to different organisational levels (Pourkomeylian 2001, Mathiassen and Pourkomeylian 2001). In this context an SPI plan should be expanded to cover not only the details of process improvement efforts but also the choice of change and knowledge management efforts in the SPI programme. Approaching SPI through a change and knowledge management point of view recommends having a change strategy instead of an SPI plan which connects people related efforts to process related activities in order to make change happen in practice. The change strategy should be clear in its focus, detailed, communicated, accepted and agreed by people in different organisational levels (management, organisations, teams) for being most effective.

Approaching SPI efforts from a strategy point of view we can consider that SPI efforts have some insights of plan, pattern and position in itself through the IDEAL model (McFeely 1996). In this way an SPI change strategy can therefore be defined as the pattern or plan that integrates an SPI effort’s major goals (process, practice, and change related), policies, and sequences into a cohesive whole. In the light of Tilles (1963) and Christensen et al. (1978) suggestions an SPI strategy should include:

- Clear and realistic objectives in order to direct all SPI efforts towards clearly understood, decisive and attainable overall goals.
- Maintaining the initiative to stimulate innovation and enhance practitioners’ and leaderships’ commitment in all organisational level (corporate, if the effort is a global initiative), business and functional level.
- Identification and concentration of the superior power (in terms of political, decisional, resources, money, knowledge and experiences) at the same place and time likely to the decisive.
- Creating space for flexibility and manoeuvre within the whole effort with focus on resources targets and objectives.
- Coordinated and committed leadership with specific responsibility for delivery of the SPI efforts’ major goals.
- Creating the ability to respond to surprises during the SPI effort. To be able to deal not just with the unpredictable but also with the unknowable.
- Creating security around resources and the important operating points in order to be able to deliver success.

Further the SPI strategy statement should include addressing of following questions:

- What is the mission of the SPI programme? Which are the quantitative expected effects of the performed SPI efforts?
- How should the whole SPI portfolio (different projects / streams within the SPI programme, e.g. Practice improvement, Knowledge Management, and Change Management stream) be addressed?
- What priority and timing should be given to each of the projects / streams in the SPI portfolio?
- How should the SPI programme position itself to compete and survive in distinct, identifiable and strategically relevant programmes in the organisation?
- Which types of changes do the SPI programme brings to which role, organisation, or group of customers?
How should the SPI programme structure, organise and manage the internal aspects of SPI, change and knowledge management in support of its chosen SPI strategy?

How can the SPI strategy formulated at the programme level be translated into concrete operational terms in such a way that separate but related projects within the programme can pursue and achieve them?

How should the individual projects of the programme organise, plan and manage their work in order not only to achieve their own aims, but also to ensure that they integrate with the other projects to create synergy?

An SPI strategy focused on addressing the above mentioned areas can create better clarity, understanding, maintainability, leadership and commitment to deliver an effect driven practice focused change programme in the organisations.

6 CONCLUSIONS

Approaching SPI from a change management point of view in the light of strategy help us to view the whole effort in a wider perspective. The focus moves some steps further from improving processes to improving practices, from planning for a project to planning for a programme, from assessing the process maturity level of the organisation to assessing the people’s ability and willingness to change, from identifying the gaps and process improvement activities to capturing and creating new knowledge, modifying and transferring it to different organisational levels. In this context the identification efforts will than be focused on identifying issues related to e.g.: resistance to change, from integrating processes to integrating change and knowledge management efforts, and from implementing new processes to cultivating a culture of change openness and management.

Through this approach the role of a detailed, clear, well documented, agreed, accepted, and communicated SPI strategy becomes more visible. This strategy should define a path for addressing the three main parallel streams of an SPI programme, i.e. Practice improvement, Knowledge Management, and Change Management. This paper suggest that an SPI effort should be based on an SPI strategy including answers for how to improve practice of software work through organisational change and knowledge management efforts. The strategy should be effect driven, fit to the organisation’s requirements and be developed and approved before the SPI efforts starts.

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