

Better processes by sprint: Agile process improvement

Timo Karasch, Method Park

Abstract

The conventional process improvement is more and more unable to cope with its excessive objectives and resource intensive planning. However, companies need to provide processes according to the established standards and norms. Agile process improvement will show how to achieve better and at the same time "lived" processes using cyclic sprints. An example project will help the reader to combine the shown topics in an agile way.

1 Introduction

"Agile" is in! Meanwhile it represents miscellaneous kinds of procedural methods. So, is "agile process improvement" just a combination of two well known concepts that should procure something new, or is it possible that its advantages will benefit by each other? What are special challenges of process improvement, and how can an agile method help facing them? This report will show a sensible combination, but of course not in a common way.

We talk about an agile topic, so all facts and ideas will not be arranged in an order that seems logical. Instead, based on scrum, we will represent an agile process improvement project (PI project) in an agile way. Beginning with a preferably broad and rated "Backlog" we will follow a cyclic approach. Thereby we will analyze all topics of agile process improvement and allegorize them in a context, till we are able to picture a complete approach. But as in agile projects, not all topics can be placed in this report. So we will address those in our conclusion.

2 The agile process improvement project

What topics can be placed in an agile process improvement project? Table 1 lists all these topics in a backlog of this report and describes their relevance.

Table 1. Backlog of this report

Backlog item	Relevance
Objectives of an agile PI project	What common objective should be achieved by this process improvement project?
Stakeholder	Who (what organizational units and experts) will be part of the performance of the PI project and what input sources should be included?
Advantages	What challenges of a PI project may be managed by an agile method?
Disadvantages	What problems may be expected using an agile approach?
Hurdles	How can we face those problems?
Definition of sprints	How can the sprints be defined, and is a definition at the beginning of a project meaningful?
Scope of PI project	Which processes should be improved in this PI project?
Requirements for a PI sprint	What requirements should be considered during a PI sprint?
Criteria / Verification	What criteria will help verifying the fulfillment of these requirements at the end of each sprint?
Planning of a PI sprint	What should be kept in mind for the PI sprint planning?
Performance of a PI sprint	How can we share information during the performance of a PI sprint?
Results of a PI sprint	What will be done with the results of a PI sprint?
Diagram of complete approach	How can these activities be shown in a complete approach of agile process improvement?

Backlog items that will be treated in a sprint will be listed at the beginning of each chapter. At the end this treatment is evaluated, and, if not satisfying, the item is kept in the backlog, or it is updated.

As you can see in this list, a lot of definitions of scrum or process improvement are used. Therefore, they will be listed below in table 2.

Table 2. Definitions of process improvement [Wen10] and Scrum [Scrum]

Definition	Meaning (in context of this report)
Assessment	An assessment is the analysis of one or more processes by a trained team of experts, identifying at least strength and weaknesses on the basis of a reference model.
Backlog	Prioritized list of requirements and estimations showing the scope of functionality, and perhaps even its complexity relatively to each other
PI	Abbreviation for process improvement
PI Sprint	Name of sprints in a process improvement project
Process improvement	Process improvement is a set of activities used to improve the efficiency and capability of processes in an organization.
Scope	The scope of a process, project, product or assessment defines the coverage and range.
Scrum	No acronym (!), but the name for the "disposed crowd in rugby". The link to scrum as name for a process of project management and development is, that the team will form the focus and discuss the planned next move for each sprint. Scrum would not work without this self-organization of the team.
Sprint	A time box of 30 sequenced days in conventional scrum

To simplify the classification of these definitions, we will add the item "Definitions of agile PI" to our backlog and treat it later on.

3 Improvement project

3.1 Objective

What backlog items will be treated?

- Stakeholder
- Objectives of an agile PI project

Responsible for our agile process improvement project is a core team, representing a quasi-scrum master. It will ensure the communication between all stakeholders and the useful allocation of all tasks. Besides, it will take care for problem resolution.

The core team identifies all relevant stakeholders at the beginning of our project (see Fig.1). Therefore, all involved organizational units shall be defined. Experts will work on tasks in later PI sprints. Process owners will act as input sources for requirements for sprints and processes.

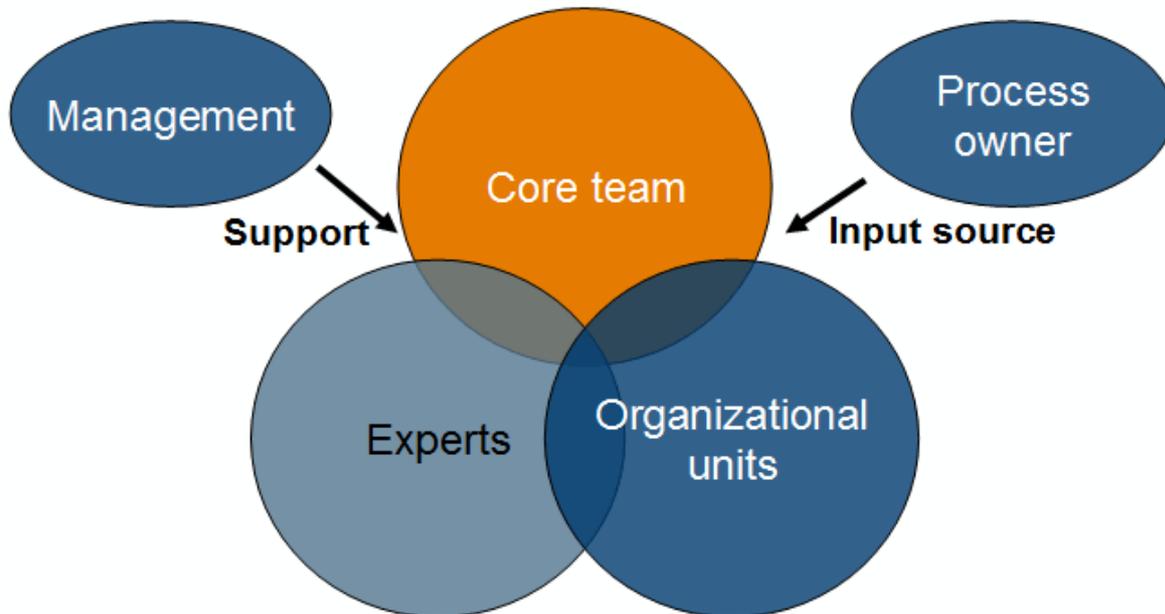


Fig. 1. Stakeholder of the PI project

The organizational unit leaders shall commit in providing sufficient resources for later task development. This is why they have enormous influence on project results. The objectives of our process improvement project should be the design of new processes, or rather the rework of existing, as well as the direct adoption in daily business to achieve "lived" processes.

Analysis of sprint results:

All necessary experts of the involved organizational units will be defined in the planning of each PI sprint.

The project's objectives make obvious, that a decision on processes to be designed or reworked is necessary. This is why we will prioritize this item for the next chapter (sprint).

3.2 Project backlog

What backlog items will be treated?

- Scope of PI project
- Definition of sprints

Our definition of scope is not limited by our method, but depends on our identification of stakeholders and involved organizational units.

The scope of our example project should include the development processes. This is why we have to provide enough resources in our PI sprints to ensure the treatment of tasks in addition to the daily project work.

But we will also focus on organizational processes that will differ in case of design and selection of experts. As both process groups (engineering and organizational) are independent, we can switch our focus in the sprints flexible or even agile; an advantage for our sprint performance.

For the definition of sprints we will decide on the duration of each sprint that will differ from the default duration of 30 days depending on the selection of processes. But we will also define rough objectives of each sprint, for example an allocation to development stages. Such a definition, as shown in table 3, can help prioritizing the work packages during the sprints.

Table 3. Development stages

Development stage	Content
1. Initiation	The first sprints will help involving the stakeholders and defining scope and requirements for the projects results.
2. Diagnosis	In the next sprints the predefined work packages will be specified using the results of process analysis. We decide on design and rework of those processes.
3. Design	The next sprints will focus on guidelines for process design and the treatment of process work packages based on our prioritization.
4. Application	Depending on our resources, the application and piloting of our new processes in chosen projects will be planned and performed.
5. Experiences	During the last sprints the usage of our results will be checked and its further handling defined.

Analysis of sprint results:

All backlog items have been treated. A detailed allocation to work packages will be part of our sprint planning.

But we identified the problem of further usage of our project results. We should analyze this in our sprint "Results of a PI sprint".

3.3 Requirements for our PI sprint

What backlog items will be treated?

- Requirements for a PI sprint
- Criteria / Verification

In agile development projects we typically handle functional requirements. Their fulfilment can be shown by a test. But in this case we have to verify non-functional process requirements. To ensure these requirements, well defined criteria are necessary, for example those shown in table 4.

Table 4. Criteria for process requirements

O	Is this requirement explicitly specified?
O	Is this requirement realistic?
O	Does this requirement match to a development stage?
O	Is this requirement sufficient to reach the PI projects objectives?
O	Does this requirement have a link to business processes?
O	Does this requirement have a link to any standard (e.g. Automotive SPICE®)?
O	Does this requirement match to the other requirements?
O	Are verification criteria defined for this requirement?
O	Is a verification of this requirement possible at the end of a sprint?

As you can see in these criteria, all defined requirements have a direct link to the development stages. The connection to business processes will help defining the relevant stakeholders for the process. An adjustment with standards simplifies the verification at the end of a sprint. E.g. you can check the fulfilment of requirements for development processes by SPICE assessments of process reviews.

Analysis of sprint results:

The treatment of the backlog item "Criteria / Verification" has just been started. So we will continue on this item in our chapter "End of PI sprint".

3.4 PI sprint planning

What backlog items will be treated?

- Planning of a PI sprint
- Usage of existing solutions

The planning of our PI sprint starts with a kick off meeting, initiated by the core team. The participation of experts of each involved organizational unit is recommended. Following, they will be responsible for the allocation of work packages in their organizational unit. Thereby sub-teams are formed which are able to care for items almost self-sufficient.

The main topic of the kick-off meeting is to establish a common understanding on the defined requirements. This should ensure the chance of a work package handling across the organization units. Smaller discussions for clarifying requirements are necessary, but the definition of a later solution will not be part of this meeting.

However, it is possible, that existing solutions will be presented by the involved experts. It should be decided, whether those solutions can be used as basis for the upcoming work packages.

A small team will be formed for each work package. Part of this team is an expert having experience within this topic. It is recommended to include even team members of organizational units, in which this know-how should be trained. Because of typically weak resources, especially those organization units should participate that currently have problems or tasks regarding this special work package.

Analysis of sprint results:

In sprint planning problems will occur that will differ depending on organizations and participants. Some of them will be discussed in our backlog item "Disadvantages".

3.5 PI sprint

What backlog items will be treated?

- Performance of a PI sprint
- Sharing information

A daily scrum meeting during a PI sprint is extremely time-consuming. Besides people of different organization units or even locations are involved. To still ensure a continuous sharing of information, a platform can help. It can show the actual objectives and work packages of the sprint as well as its status. Team members can report results and address problems.

Challenges are collected, and the core team will care for a solution. Possibly resources have to be switched according to new project needs. At the end of a sprint all members can verify the reported results.

Present upcoming project challenges that will lead to a new prioritization of work packages in this sprint have to be addressed. The decision, whether a change of sprint panning is necessary, will be done by the core team of the PI project. This is why a cyclic (e.g. weekly) meeting of core team and experts is necessary to address resource problems and to assign problem solutions.

Analysis of sprint results:

Problems and hurdles of this approach are still not addressed. As mentioned before, we will discuss this in a separate chapter (sprint).

3.6 End of PI sprint

What backlog items will be treated?

- Closure of a PI sprint
- Criteria / Verification
- Usage of results

At the end of each sprint the fulfilment of all defined criteria has to be checked. The core team will be responsible, that all verifications of results are assigned, especially to organizational units or experts that were not involved in the solution development.

The definition of done should define the closure of a working package or the need to improve this solution in the next sprint.

Furthermore, a piloting of the developed solution may be necessary. Therefore, possible organizational units and projects shall be selected that will use the new or changed process during the next sprint.

The check of all solutions by the core team should lead to a positive answering of the following questions:

- Does this solution fulfil the defined requirements?
- Is this solution compliant to the requirements of a standard (e.g. Automotive SPICE®)?
- Does this solution fulfil the business requirements for processes (e.g. the design of activities, roles and methods for each process)?
- Is the usability of this solution ensured?

This finally leads to the question, how those results should be used in future. Some solutions will still be preliminary results having to be detailed in the next sprints or being already prepared for piloting.

After a successful piloting this solution shall be defined as a new minimum standard for all involved organizational units. Following, process modeling in an adequate tool, the definition of trainings or first feedback loops may be part of the PI project as well.

Analysis of sprint results:

The last paragraph leads to a new question: What activities may be part of our PI project (e.g. process modeling), and what will be done in a conventional way? Apart from that, all backlog items have been treated completely.

4 Complete approach

What backlog items will be treated?

- Definitions of agile PI
- Diagram of complete approach

To simplify all defined topics and definitions, we will use a diagram in Fig. 2 which graphically shows their relationship.

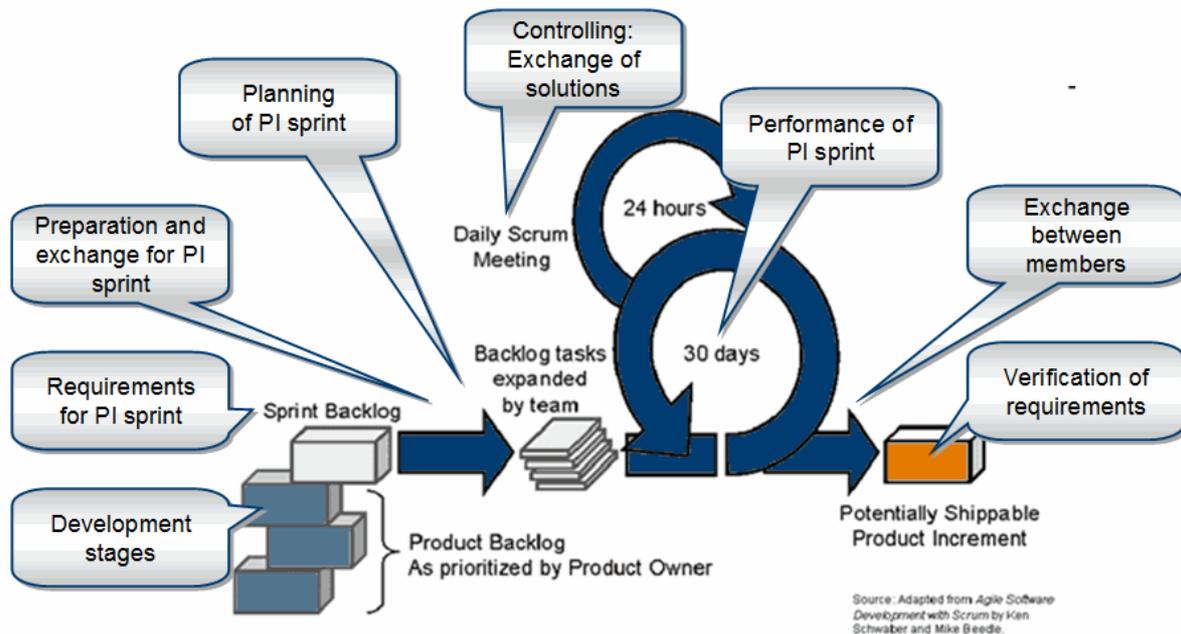


Fig. 2. Complete approach of agile process improvement (on the basis of Scrum [Sch01])

Analysis of sprint results:

To close this backlog item, it should be mentioned that this diagram only shows one possible variation of agile process improvement. As described before, all defined topics may be combined according to your special basic conditions.

5 Advantages and Disadvantages

What backlog items will be treated?

- Advantages
- Disadvantages and hurdles

If we define quality as the sum of people, methods and processes, we will be able to identify advantages in all these three areas.

Processes:

- Using this agile approach, we define piloted and even "lived" processes that can directly be transferred as a minimum standard into business processes.
- As we focus on problems and challenges in project context, our developed solutions will be adequate for project conditions.
- Over-engineering will be avoided as we focus only on necessary processes. We will at first use a process before we start detailing its activities as needed in project context.

- The inclusion of piloting in PI sprints already realizes the first feedback loop. Experience is shared and examples may be documented.

Methods:

- The agile approach will lead to manageable and accessible objectives for each sprint. In conventional process improvement projects the long-lasting goals for the next years may sometimes be unrealistic and frustrating.
- The early sharing of ideas and the focus on well defined requirements will simplify the usage of existing solutions.
- Improvements may be measurable and verified soon as we use short cycles. Success may contemporarily be communicated, and necessary corrections will be performed.
- By addressing work packages to more organizational units and focussing on current problems in projects, resources for urgent improvements can be allocated much more efficiently.

People:

- Beside the core team, the experts represent a central role in PI projects. They have got the chance to add their experience and at the same time increase their know-how. A contemporary transfer of those solutions that may even come from further team members into the organizational standard will lead to a feeling of success.
- The goal-oriented meetings of experts and team members strengthen the community and support the know-how attainment.
- Besides the work in teams across the organizational units or locations will be possible and supported.

The shady side of agile process improvement will show all hurdles any agile project has to cope with (see Fig. 3).

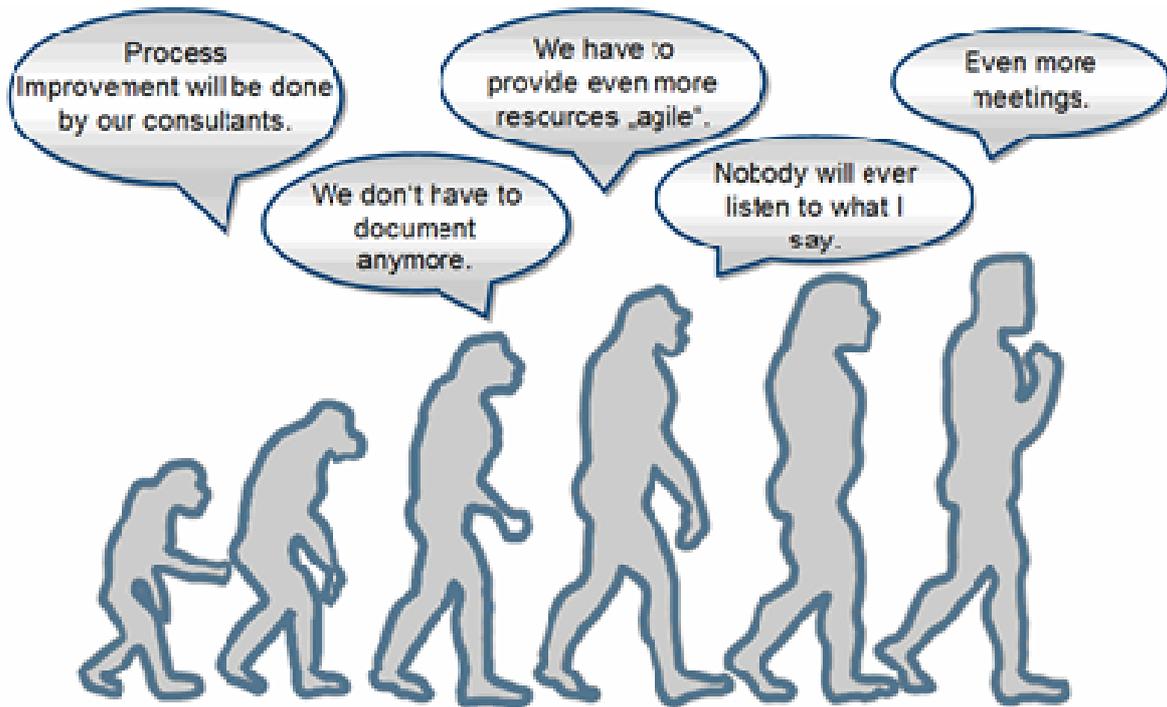


Fig. 3. Typical assertions in agile projects

But a specific work of the core team could guarantee the preconditions for a successful improvement project:

- Point out, that everybody in your organization will be part of your improvement activity, and that even the management will show its commitment.
- Point out, that documentation is needed to transfer knowledge in your organization. Therefore, documents should show your actual approach.
- Point out, that resources should just be allocated compliant with your project conditions. They represent an easy way for participation in solutions according to your project problems.
- Point out, that everybody is welcome to deliver ideas for improvements or solutions, and ensure that success is shown immediately.
- Point out, that meetings are used to define requirements and objectives, and prefer short, specific meetings instead of long, excessive ones.

6 Open points

The analysis of our backlog shows, that most of the defined items have been treated in this report. Some items would be too extensive to discuss them in any detail. But we will shortly outline the three most important questions for agile process improvement:

What costs will come up with agile process improvement?

- The actual costs are dependent on many factors. Therefore, a concrete answer is not possible. Especially the work of the core team and experts will cause costs that should be heard by the management and the organizational units. As we address work packages to different business units according to their project conditions, compared to conventional process improvement, costs may be saved. Short cycles will enable a cost-benefit analysis.

What activities of process improvement may be performed agile?

- The answer to this question is dependent on the knowledge and capacities of the organization. This example PI project focuses on the design and piloting of processes. If the interfaces within the organization could be managed, even the analysis of processes. The modeling in an adequate process tool, or even the planning and performance of trainings may be handled in the agile PI project.

Will this approach lead to agile processes?

- The answer is no. This agile process improvement project was meant to design "lived" but also well documented processes. Potentially, the shown topics may be appropriate to define agile processes, but this evaluation should be done by each reader himself.

7 Conclusion

We will use the conclusion to answer the two main questions of agile process improvement using the shown topics:

- What should we keep in mind?

Agile process improvement allows all members to become part of the improvement. But this also means that not always everybody will focus on the same objective. Therefore, keep the shown hurdles in mind, develop solutions that directly map to your organization. People may be the driving force, but they are also the greatest barrier.

- Why should we do it?

A lot of organizations failed to cope with the challenges of process improvements. This agile approach cannot be the solution for all these problems. But it provides methods to exactly treat those problems a lot of projects are suffering from. These may be resources or the impatience of process improvement leaders and management. This agile approach will allow you to manage your resources agile and measure your success contemporarily. If you are able to celebrate this success, your agile process improvement will come to a happy end.

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Autor



Timo Karasch ist als Senior Consultant für die Method Park Software AG tätig. Seine zentralen Themen dort sind Automotive SPICE® und die Verbesserung von Prozessen in der System- und Software-Entwicklung.

Kontakt

Method Park Holding AG
Wetterkreuz 19a
91058 Erlangen
Tel. 09131 97206-0
Fax 09131 97206-200
info@methodpark.de
www.methodpark.de