

Agile Project Management with Scrum: Extension Points

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Abstract—The introduction of an agile project management approach for the development of software in practice is still a challenge. Scrum is one of the most popular project management framework for IT projects, however the individual and project specific environment and scope of a project requires customizations. This paper presents some basic considerations regarding process models and discusses some extensions and modifications that can be helpful when Scrum is applied in real life projects: The focus is on the specifics of interactive media software projects in order to give a concrete example. This is done by defining extension points to the role model and the artifacts, so that the customization of a Scrum-based project management approach is easier.

Keywords— Agile project management, customization of project management, IT projects, process model, Scrum

I. INTRODUCTION

IN IT (information technology) projects one of the fundamental questions is what process model or what project management standard should be chosen, e.g. PRINCE2 or PMI. In this context, also maturity or assessment models like ISO 15504 / SPICE are discussed. Interestingly, neither formal process models nor maturity models like CMMI are relevant for the success of a project as the OFFIS study [1] has shown: If your paper is intended for a *conference*, please contact your conference editor concerning acceptable word processor formats for your particular conference.

- 1) "The project result is independent of the use of a maturity model." [1, p. 280]
- 2) "The use of a process model and the project's success seem independent." [1, p. 285]

Therefore a in detail discussion about the different (heavyweight) process or maturity model seems to be unnecessary [2]. However, a flexible and lightweight project management approach is needed in order to ensure that certain techniques that have been proved to be advantageous in practice can be applied, e.g. incremental iterative process, time-boxing, milestone, daily status meeting.

The agile project management approach Scrum [3] is used as a framework that has to be adjusted to the individual situation. So in contrast to heavyweight process models (e.g. V-Modell XT [4]) that come with an almost complete list of roles, documents and activities that have to be tailored and "downsized" before they can be applied, Scrum contains only

a few rules and roles that make it easier to understand and apply:

- 1) Three roles: Team, Scrum Master and Product Owner. The team is responsible for the development of the product, the Scrum Master ensures that the Scrum process is correctly used and the Product Owner.
- 2) Few rules and techniques, e.g. daily (stand-up meeting), planning poker, sprint (time-boxing), requirements (product backlog), monitoring (burn-down-chart)
- 3) Lightweight process: Sprint planning, sprint (iteration), sprint demo (product review) and retrospective (process-oriented quality assurance).

The Scrum process model consists of several time-boxes that allocate a fixed time period. Two of them are shown in fig. 1: The day during a sprint and the sprint itself. The day starts with the daily meeting and ends with an implemented user story or a task that has been done. Unfinished work must be estimated and resumed on the next day. The sprint duration is typically 4 weeks or 30 days.

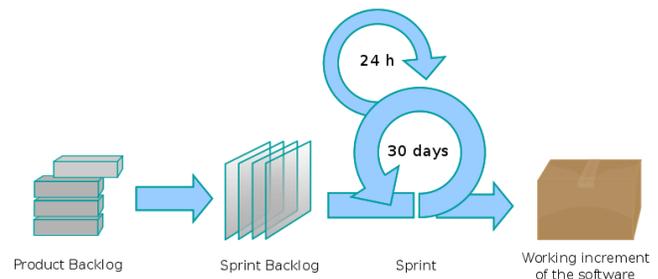


Fig. 1 Scrum process (source: Lakeworks, wikipedia.org)

II. INTERACTIVE MEDIA SOFTWARE PROJECTS WITH SCRUM

Software systems with an user interface that are highly interactive and provide multi-media content are called *interactive media software (IMS)* in this context. Projects for the development of IMS require specialized personnel, processes and artifacts. An example is a content management system (CMS) for web sites: The user experience has a top priority because interaction with a CMS must fulfill ergonomic and corporate identity requirements. Therefore, not only usability is important and contributes to a positive user experience (UX), also aspects like accessibility, aesthetics and joy of use.

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An example for an IMS project structure exemplifies the specific needs for roles and artifacts (see fig. 2): For the development of an e-commerce web site, an UX expert (User Experience) and a graphic designer take care usability aspects and graphic art. Also on the requirements side, the product owner role splits up into two different experts: A business administrator (for the financial and logistic aspects) and a marketing expert.

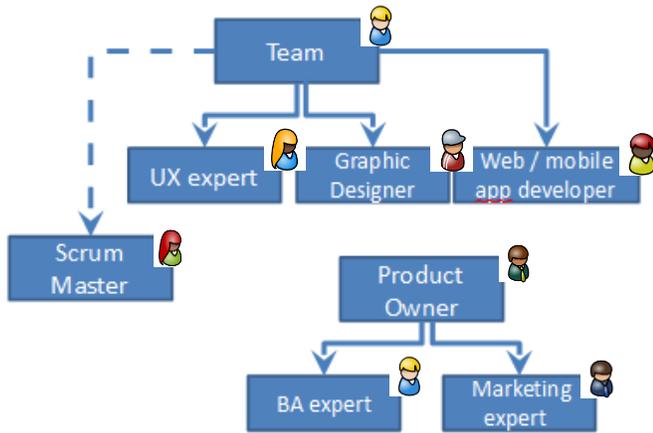


Fig. 2 Example for IMS project with specific roles

Another modification is the team membership of the Scrum Master: Because the small size and limited complexity of the project and also the experienced team, the Scrum Master is able to work part-time as a team member. This is not recommended by Scrum, but can be described as a pragmatic approach in order to balance the workload.

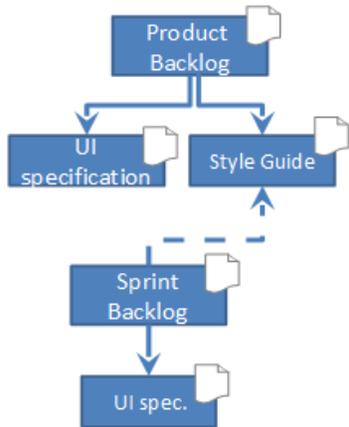


Fig. 3 Scrum artifacts and extensions

The artifacts for IMS projects are also to be extended. The product backlog contains the user stories, however the non-functional requirements, e.g. corporate design style guide, must be considered. The user interface (UI) is specified using screen mock-ups or UI scribbles and a web site navigation concept (see fig. 3). The Sprint Backlog contains part of the UI specification relevant for the Sprint and also refers to the Style Guide.

Process-oriented aspects are also relevant for the extension

of a Scrum-based IMS project, e.g. the Sprint planning needs a session where the product owner, the UX experts and the graphics designer discuss user interface topics like color scheme, navigation, interaction element design, product presentation etc. Also usability tests, e.g. thinking aloud protocol, heuristic evaluation, observation or gaze tracking analysis must be discussed and planned. During the Sprint the user interface must be designed in detail and implemented. After the Sprint usability tests are necessary (see. fig. 4)

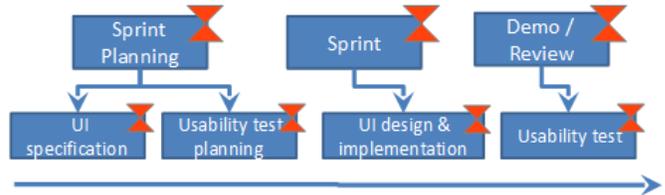
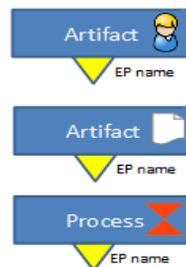


Fig. 4 Process-oriented extensions

III. EXTENSION POINTS FOR SCRUM PROJECTS

The example described above shows the necessity for the extension of Scrum for IMS project. General *extension points* for the roles, artifacts and the process can be derived, so that other projects and not only IMS projects can extend and setup their own Scrum-based project management approach. An extension point marks an “area” that can be modified or extended for a specific purpose. Every extension point (EP) is shown in graphical form with its reference object and is described in tabular form in detail (see fig. 5). Three extension point types are possible: role EP, artifact EP and process EP.



EP « name »	
Description	
EP Type	
Project Type	
Basic conditions	
Considerations	
References	

Fig. 5 Extension point types and tabular description template

Extension points for all three EP types (role, artifact and process) are shown in the following.

A. Role Extension Points

Extending the roles is possible via 5 extension points: More specific roles can exist in a team (EP “team roles”), the team members can work at distributed locations (EP “distributed team”), the product ownership is hierarchically structured (EP “Chief Product Owner (CPO)” and “Domain Product Owner (DPO)”) and the Scrum Master can also be a member of the team (EP “Team membership”). Fig. 6 shows the extension points for the Scrum roles.

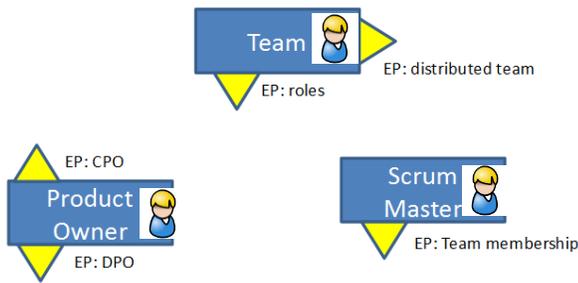


Fig. 6 Extension Point for Scrum roles

Providing tabular descriptions for all the extension points would go beyond the scope of this contribution, but the following example shows the application of the template:

TABLE I
EP

EP Domain Product Owner (DPO)	
Description	A DPO is an expert for a specific (sub-)domain and manages the requirements for this (sub-)domain. He or she is responsible to maintain the Product Backlog Items for the (sub-)domain in accordance with the (Chief) Product Owner
EP Type	Role
Project Type	Large Projects (more than 1 Scrum team oder more than one domain, sub-domains resp.)
Basic conditions	DPO must be familiar with the sub-domain and be qualified to work as a Product Owner
Considerations	Coordination and requirement workshops are necessary in order to adjust and evaluate the different requirements from the DPOs in order to avoid contradictions or inconsistencies.
References	

B. Artifact Extension Points

For the artifacts four extension points are possible: Guidelines that must be considered (EP “guideline” for Product and Sprint Backlog) and non-functional requirements that must be met (EP “non-functional spec.” for Product and Sprint Backlog)

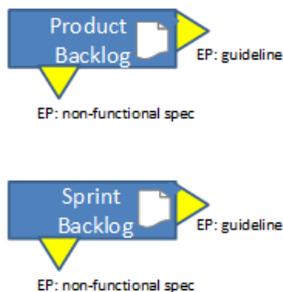


Fig. 7 Extension Point for Scrum artifacts

C. Process-oriented Extension Points

Process-oriented extension points are for the Sprint planning (EP “non-functional specification” and “test and

evaluation planning”), for the Sprint (EP “non-functional requirements implementation”) and the Demo / Review (EP “specific tests and evaluations”)

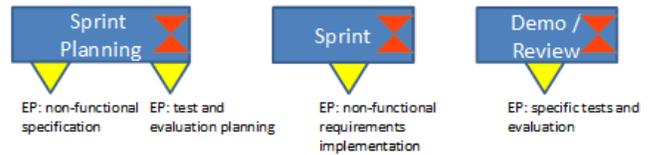


Fig. 8 Extension Point for Scrum process

IV. CONCLUSION

Extension points for Scrum-based projects can be a help in order to customize the project management: Individual and specific requirements can be met, e.g. for interactive multi-media software projects. Extension points can be used for roles, artifacts and processes. In many projects, specific roles, like the usability expert are necessary. The extension point “team role” for instance allows the definition of such a specific role and give detailed information about how to implement the new role. Also artifacts must be extended, e.g. for non-functional requirements. A UI style guide is a good example for a non-functional requirements document that is to be considered during the Sprints. Process-oriented extension points enables the team member, the product owner or the Scrum Master to add specific techniques or methods to the Scrum process. An example is the planning of usability tests (Sprint Planning): Since these tests can be time and resource consuming, a detailed plan needs to be created. After the Sprint the planned usability test must take place. Therefore the extension points for Scrum can be seen and used as an optional customization tool for Scrum-based projects.

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