Proposal guidelines and development plan

Introduction

Due to the speed, frequency, complexity and diversity of changes needed for modern software-rich systems, teamwork is crucial in software development, however, studies of software development teams report challenges with communication, coordination, learning, prioritising work tasks, team orientation and team leadership.
Agile teams are cross-functional, bringing together experts from different domains to work together. They also aim to be empowered, self-reflecting and self-adjusting, opposing the characteristics of teams where coaches and leaders are central controlling leadership figures. [1]

Characteristics of a Great Scrum Team

Scrum is a framework that helps develop products with high value while using agility. To build a great Scrum team we need a Product Owner, who maximises value, a Scrum Master, who facilitates continuous improvement and the Development Team, focused on delivering high-quality product increments. [2]

The ideal size for a development team is said to be between four and nine members. This size correlates to increased productivity, since it makes communication simpler and increases trust among team members. [1]

Product Owner

The Product Owner is responsible for maximising the value of the product and the Development Team's. He brings the customer’s perspective and maintains a clear product vision, managing the Product Backlog by prioritising based on stakeholder and user feedback. [2]

A great Product Owner needs to share the product vision and ensure clarity of it to the Development team. He tries to exceed customer expectations and makes decisions that support the team. Balancing priority, risk, value, learning opportunities, and dependencies is required for ordering the Product Backlog, that is a duty from the Product Owner. The Product Owner it’s up to applying the right techniques for different scenarios and explaining user stories clearly. Both functional and non-functional aspects of the product are critical for efficiency, and the Product Owner needs to manage them as best as possible. [2]

For success, it is vital to understand the business domain and stay informed about market conditions. A great Product Owner operates across the different levels of Agile: the product vision (level 1), which feeds into the roadmap (level 2), guiding release planning (level 3). Sprint Planning (level 4) is when the Development Team decides which backlog items will complete in the Sprint, while Daily Scrums (level 5) are used to check the progress and adapt it if needed. [2]

A Product Owner must be available to answer questions promptly as they are made by the stakeholders, customers, or the development team. They are responsible for business value, Return on Investment (ROI), and he needs to ensure if enough time is spent refining the Product Backlog. [2]

Scrum Master

The Scrum Master ensures if the team understood and implemented the SCRUM effectively, acting as a servant-leader for them. His focus is to support the team achieving the objectives and coaching the team members the mindset and behaviours needed to do that. [2]

A great Scrum Master ensures the team uses and understands Scrum processes. He is aware of the phases teams go through and recognize conflicts early in order to solve them quickly. He values a consistent sprint rhythm and works to maintain it. He also tries to prevent the team from failing. Sharing experiences with others and motivating the team are part of his skill set. [2]

Development Team

The Development Team is made up of professionals who work toward delivering a potentially releasable product increment at the end of each Sprint. They organise themselves internally for maximum efficiency and decide how to transform the Product Backlog into working solutions. There are no subteams within a Development Team. [2]

A great Development Team uses Extreme Programming (XP). This means that practices related to planning, designing, coding, and testing, such as code refactoring, pair programming, continuous integration, and unit testing are used. "Team swarming" is used too, which means the team tries the team to complete them as quickly as possible only on a few items at a time, preferably one. [2]

One of the responsibilities of the Product Owner is to organise the Product Backlog. However, the Development Team is responsible to refine it. They know the importance of clean code, and that is why if some code is messy, they work to improve it. The team needs to be cross-functional and values technical and architectural innovation. [1]

Main aspects and models

Despite the wealth of advice available on effective teamwork, there is a lack of a cohesive model specifically tailored for agile teamwork. To fill this gap it is proposed the Agile Teamwork Effectiveness Model (ATEM).

ATEM gets insights from empirical studies on agile teams, general teamwork studies and specific practitioner advice. It consists of coordinating mechanisms that support the following critical components of teamwork effectiveness.[5]

Shared leadership in agile team dynamics encourages distribution of leadership roles among all team members, enhancing empowerment and accountability. Peer feedback encourages continuous improvement through regular and constructive evaluation. Redundancy ensures team members have complementary skills, allowing for greater flexibility. The adaptability allows the team to adapt quickly to changes. Team orientation aligns individual effort with collective goals. Shared mental models ensure a shared sense of purpose. Mutual trust provides security for cooperation, and communication facilitates clear and open exchanges within the group.

We can see by looking at the Katzenbach and Smith Model, that shared leadership is promoted in this model because it's a model that emphasises the importance of collective responsibility and collaboration. Leadership is a shared endeavour because team members are encouraged to take initiative and use their strengths and knowledge. This enhances the team's flexibility when faced with challenges. Team members shift from an individual mindset to a team mindset and can help increase engagement and ownership. [3][5]

Peer feedback and Mutual trust are supported by the Lencioni Model where we can see the need for trust and vulnerability inside the team. In this model every team member is open to give and receive feedback (team members must hold themselves and each other accountable by admitting mistakes, even when this is uncomfortable to do) so that the team can continuously improve the performance and dynamics. A lack of trust between team members or an environment with unresolved conflicts can lead to communication and hierarchical structures. [3][5]

The Tuckman Model outlines the stages of team development: forming, storming, norming, performing, and adjourning. In this model, at the norming stage, teams start to understand each other's roles better, quirks are accepted and tolerated and everyone starts to understand the importance of working toward the collective goal as a team leading to team members developing overlapping skills. This redundancy allows team members to cover and help each other, which doesn't compromise the workflow. [3]

In models like the Hackman Model, adaptability is present at all times. In this model the goal is to give the team the tools they need to eventually be self-sustaining, emphasising the need to adapt given the challenges they encounter. [3]
This model offers autonomy and also fosters creativity, as team members are able to think outside the box and take risks without fear of being micromanaged. This can lead to innovative solutions, improved problem-solving, and a more dynamic and adaptable workplace. [4]

Team Orientation is reinforced through the GRPI Model since it is best suited to dysfunctional teams that aren't hitting their goals or have lost direction and can help identify the cause and resolve it. [3]

Shared mental models refer to the collective understanding among team members regarding their tasks, goals, and each other's skills. It develops over time through familiarity with each other and the work context, allowing team members to anticipate each other's needs, facilitating smoother coordination and reducing interruptions. To evaluate this understanding it is essential to assess if team members can predict one another's

requirements. This can be made easier by keeping teams together over time, integrating newcomers quickly, having daily meetings, retrospectives and social activities and by pair programming. [3][5]

Communication is vital for every single team and that can be seen in every model listed so far and more. Every model emphasises the importance of clear communication channels and active listening. Teams that prioritise open dialogue are better equipped to share information and make informed decisions which lead. It is also important to have spaces for informal interactions between team members, pay attention to the frequency of the meetings and have a physical or virtual board to visualise tasks. [3]

Plan

To facilitate communication, we set up a channel on Discord, allowing us to share ideas, difficulties and our progress. We also have a board on GitHub, which will contain every user story and task we do throughout this project. Through these two mediums, we will always be on the same page about what to do next, and up to date on what each person is doing at each moment. This allows our team to work better, since it emphasises informal and regular communication, and lets us make use of each ATEM coordinating mechanism and component. [5]

We have many different ways to estimate the effort needed for each task, some more optimistic, and some more risk averse. In optimistic estimates, people assume everything goes well, in contrast to the worst case estimates where the estimate is based on the most effort that may be needed to deliver something. [6]
In our case, we will use a Median estimation because it integrates some uncertainties but the bad scenarios won't affect it so hard.

We want to improve our estimation after each sprint. To do that, we will use simple estimation models tailored to local contexts in combination with expert estimation. Based on the historical estimation error we will set minimum-maximum effort intervals. We also will use checklists tailored to our own organisation and will avoid early estimates based on highly incomplete information. [7]

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