Enhancing product management in the ATLAS Management Glance team

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Abstract. CERN has a very dynamic environment and faces challenges such as information centralization, communication between the experiments' working groups, and the continuity of workflows. The solution found in 2003 for those challenges was automation and, therefore, the Glance project, an essential management software tool for all four large LHC experiments. Its main purpose is to develop and maintain web-based automated solutions that are easy to learn and use and allow collaboration members to perform administrative tasks quickly. The ATLAS Management Glance team (AMGT) is a subset of the Glance team focused on addressing the software requests of the ATLAS Spokesperson and deputies. The team maintains 11 systems that allow the management of ATLAS members, appointments, analyses, speaker nomination, and selection, among other tasks. Historically, each Glance developer would be an expert in the requirements of one or more systems, but their product management was inefficient, lacking the mapping of the product vision, goals, business rules, stakeholders, and metrics. Also, the team's roadmap lacked predictability since it had no planned timeline. In December 2023, the AMGT adopted the Product Owner role concentrated in a single person as stated in the Scrum Guide. This contribution dives into the challenges faced by the Glance Team Product Owner in establishing a strategy for effective product management and roadmap planning and the key takeaways from that process.

1 Introduction

CERN, the European Organization for Nuclear Research, stands as one of the most prestigious scientific institutions globally, dedicated to advancing the understanding of particle physics. Established in 1954, CERN has been pioneering significant discoveries and technological innovations within the field. This success is made possible by its collaborative workforce, which includes thousands of scientists, engineers, technicians, and administrative staff from across the globe.

One of the cornerstone experiments conducted at CERN is the ATLAS experiment [1], the largest operation at the world's most powerful particle accelerator, the Large Hadron Collider (LHC) [2]. The primary mission of ATLAS is to explore the fundamental particles and forces

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that constitute the universe, answering questions such as what the basic building blocks of matter are. The experiment engages a global community of over 6000 active members, working across numerous institutions and time zones. Therefore, the ATLAS collaboration faces the challenge of coordinating diverse and spread working groups and managing the large amounts of data required to run the experiment efficiently. As an automated solution to support the achievement of this challenge, the Glance project [3] was born in 2003.

The primary objectives of the Glance project are to guarantee the efficient and effective management of CERN experiments' personal and administrative data, and support the working groups' workflows. Currently, the Glance team implements web systems for the biggest LHC experiments: ATLAS, ALICE, LHCb, and CMS. Within the ATLAS experiment, the ATLAS Management Glance team (AMGT) specifically addresses software requests from the ATLAS Spokesperson and deputies. The team focuses on developing and maintaining interfaces for managing key entities such as member information, employment records, appointment assignments, paper submissions, and speaker selection.

Historically, each AMGT member was an expert in the requirements of one Glance system. However, this approach is not ideal according to the Scrum Guide [4], which explicitly states that "The Product Owner is one person, not a committee". The Product Owner (PO) role is crucial and designed to be filled by a single person to ensure clear accountability and streamlined decision-making. In December 2023, the AMGT restructured its approach and centralized the product management to a single person, aligning with the Scrum Guide's principles.

Before adopting the PO role, the AMGT developers had to manage their resources between product management tasks and coding. As a result, code development work naturally took precedence and the team's product management was often neglected, lacking the mapping of the product vision, goals, business rules, stakeholders, and metrics. Additionally, the team's roadmap, a plan outlining a project's milestones, deliverables, and timelines, lacked predictability. Operational tasks were not being prioritized and developer productivity was affected by frequent interruptions to coding activities. The next sections will describe the actions taken to change this scenario and the results achieved so far with the PO role adoption.

2 Product Backlog Management

The Product Backlog consists of a dynamic repository of work items ordered by their priority. The Backlog helps the team to maintain a clear focus on the work that delivers the most value, ensuring that high-value features, urgent bug fixes, and important operational tasks are tackled first. Complementing this, a Sprint is a time-boxed period during which the team selects a set of high-priority items from the Backlog to complete, allowing for opportunities to inspect and adapt their workflow.

Before the PO role centralization, the team's Backlog faced several challenges. It contained numerous outdated tasks, including requests from individuals no longer associated with ATLAS. Additionally, operational tasks crucial for system maintenance, such as code refactoring and infrastructure improvements, were often deprioritized in favor of new functionality requests and risked being overlooked. With the introduction of the centralized PO role, one of the first actions taken was a comprehensive review of tasks. Priorities were re-evaluated, and outdated or irrelevant requests were removed, ensuring an up-to-date and relevant Backlog. Furthermore, the prioritization of operational tasks is now regularly reviewed, ensuring that essential maintenance activities are completed to sustain the systems' health and reliability. Thanks to the strategic visibility provided by an organized backlog, the prioritization of non-operational tasks was carried out in a way that did not compromise other deliveries or deadlines.

The following chart in Figure 1 illustrates the variation in operational tasks addressed during the Sprints from January to July 2024. The average number of operational tasks per Sprint was 6, accounting for 17% of the total average.
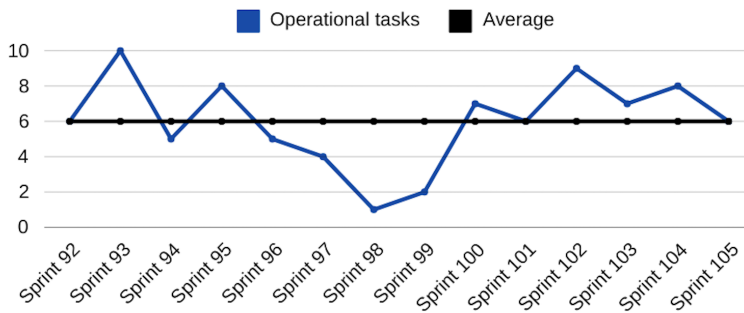

Figure 1: Number of operational tasks per Sprint in the first six months of 2024.

3 Communication with Stakeholders

Stakeholders are individuals, groups, or organizations interested in the outcome of a project or product. They can influence or be affected by the project's objectives, decisions, and outcomes. Stakeholders include both internal parties, such as team members and management, as well as external entities, like customers, suppliers, regulatory bodies, or the community.

Before December 2023, all AMGT developers were responsible for interacting with stakeholders and managing their requests, which frequently interrupted their focus on implementation tasks. Additionally, since each team member was an expert in the requirements of specific systems, they also had to stop coding to participate in meetings related to those systems.

Having a single PO, the responsibility for external communication has been centralised. The PO now serves as the primary point of contact for all stakeholder interactions, which benefits both the stakeholders and the development team. For stakeholders, having a dedicated PO ensures consistent, clear, and timely communication, making it easier to align expectations and receive updates. This centralized approach also allows developers to focus on their implementation work without frequent interruptions, leading to higher productivity.

As a positive outcome of the PO centralization, from the last trimester of 2020 to the first trimester of 2024, the team's velocity per FTE (full-time equivalent) rose from 4.5 to 5.5 story points [5] per Sprint, meaning that a Backlog item could be completed in a shorter period of time. This result displays a significant improvement in the team's productivity.

4 Documentation

Before the adoption of the AMGT PO role, although some product documentation existed, much of it was outdated and organized in a way that made it difficult to locate relevant information. This lack of structured and up-to-date documentation often hindered the team's efficiency, particularly affecting new members who relied heavily on expert team members to understand the AMGT systems.

With the PO role, significant progress has been made in revising the documentation for each system. All deprecated documents were removed, and new, well-structured documentation was introduced. Each system now has its own comprehensive set of documents, including a glossary and an overview that covers system terminology, stakeholders, the context in which the system operates, the problems it solves, and its main functionalities. This new documentation framework ensures that crucial information is no longer siloed among expert team members but is accessible and understandable for all team members, especially newcomers, fostering the team's onboarding and overall collaboration.

5 Metrics

Software metrics measure specific attributes of a software product or a software development process [7]. In other words, they are measures of success. However, to define metrics, it is crucial to define success goals before considering what to measure and how to measure it. Answering the following questions is defined as a goal for the AMGT:

- How is the team's organization affecting developers' productivity?
- How is the alignment between planned and real deadlines of roadmap items?
- How is the alignment between planned and completed tasks?

5.1 How is the team's organization affecting developers' productivity?

By February 2024, the AMGT had four roadmap items being developed in parallel. As a consequence, team members started to complain about a lack of focus, prompting the decision to divide the team into two groups, each one working on a single roadmap item. That way, projects could be implemented in parallel but each group could keep development focus on one roadmap item only. To track whether this decision was producing positive results, making the team faster and more focused, the team's velocity per FTE before and after this change was measured.

From the first to the second trimester of 2024, the team's velocity per FTE remained stable at 5.5 story points per Sprint. Although the team's overall velocity didn't show an increase, retrospective meetings revealed that focusing on only one roadmap item at a time helped developers stay more focused and satisfied with their work, as they no longer faced the overhead of constantly switching task contexts. Additionally, concentrating on just two roadmap items instead of spreading efforts across multiple initiatives allowed these items to be completed faster.

5.2 How is the alignment between planned and real deadlines of roadmap items?

As previously mentioned, before the PO role centralization, the AMGT was not estimating the start and end dates of roadmap items or monitoring their progress. Since December 2023, this became possible by using the Jira Advanced Roadmaps [6] plugin. The estimation process starts by setting the expected effort needed to complete all the tasks of a Roadmap item. Then, the Advanced Roadmaps tool allows the simulation of the development in a timeline format respecting any parallelism or dependencies they might have between them, as can be seen in Figure 2. This simulation helps to visualize how long a project will take and, once it becomes a real plan, it is possible to create new simulations in case of any unforeseen delays or change of scope.
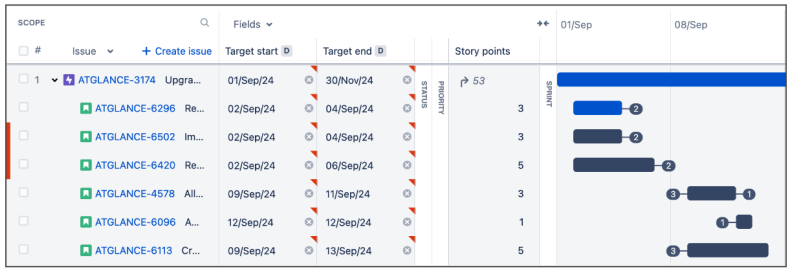
Figure 2: Demonstration of task/issue planning and monitoring using Jira Advanced Roadmap.

With roadmap planning and monitoring, the team can now evaluate if a project is late or not, as the PO can compare the planned end dates with the actual ones. The metrics related to the projects delivered with similar complexity from January 2024 to July 2024 can be found in Table 1.

Table 1: Comparison between roadmap items' planned and real end dates.

Roadmap item	Target end date	End date	Delay
Acknowledgements GitLab Integration by Paper	31/01/2024	29/02/2024	30 days
SCAB Nominations v1.8.0	16/02/2024	22/03/2024	36 days
PubTrack Egroups reduction	15/03/2024	18/04/2024	35 days

Table 1 shows the planned and actual end dates of the roadmap items developed after the PO role was adopted. Although all the projects were late, having target dates helped the team to understand if and how much a project was delayed so the team could act to minimize the consequences. This included removing low-priority tasks from the scope and managing stakeholders' expectations. It is important to stress that the target dates presented were the first estimates. When monitoring revealed that a project was running late, new deadlines were agreed upon with the stakeholders. Thanks to effective backlog management and continuous integration practices, any delays primarily affected lower-priority tasks, minimizing the impact on critical deliverables.

5.3 How is the alignment between planned and completed tasks?

Since the PO started to monitor the number of story points planned per Sprint versus the number of story points completed, it became evident that there was a considerable discrepancy between them. The assumption was that some team members might be performing activities not accounted for in Sprint Planning. The PO then started to reduce each team member's Sprint capacity by accounting for the time spent on non-coding activities such as meetings, deployment procedures, and merge request revisions. This adjustment made the discrepancy between planned and completed story points per Sprint smaller, as can be seen in Figure 3. Even though the discrepancy decreased, the team's velocity wasn't impacted, as previously mentioned in 5.1.
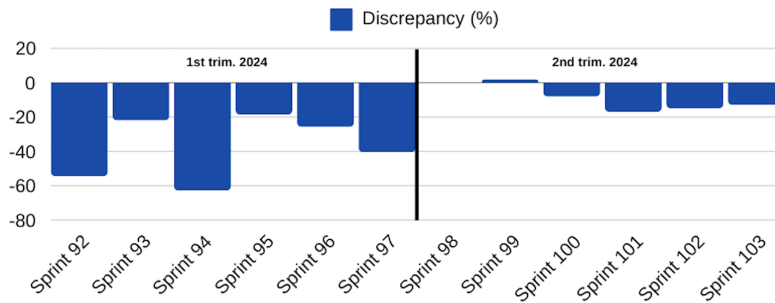
Figure 3: Discrepancy between planned and completed story points in the first semester of 2024. The black line indicates when the team started accounting for non-coding activities.

6 Conclusion

The adoption of the PO role within the AMGT has led to improvements across various aspects of its workflow. Enhanced documentation now includes comprehensive and organized information for each system, facilitating easier knowledge transfer and onboarding.

Product Backlog management has become more efficient with regular revisions and prioritization, ensuring that both high-priority requests and operational tasks are addressed timely. Roadmap management, through the Jira Advanced Roadmaps tool, has allowed for better planning and monitoring of roadmap milestones and early identification of delays.

The PO has streamlined stakeholders' communication by handling emails, meetings, and Product Backlog items. Acting as the team's spokesperson, the PO ensured clear and consistent communication while shielding developers from external interference. Additionally, the implementation of software product metrics has provided insights into the team's development process, leading to improved team focus, better delay risk mitigation, and more accurate Sprint Planning.

7 Next Steps

To ensure a well-organized and effective Product Backlog, the plan is to conduct Backlog cleaning more frequently. This approach will help remove outdated or irrelevant items regularly, allowing the team to concentrate on the most critical tasks. Additionally, there is a commitment to maintaining a focus on operational tasks, intending to keep these at or above 10% of each Sprint's workload. This strategy is likely to support the maintenance of code quality and the long-term stability of the systems.

Currently, target date estimations for roadmap items are made only as the previous item nears completion. Moving forward, the plan is to have a comprehensive roadmap for the entire year by the end of the previous year, setting start and end dates for all roadmap items scheduled for the upcoming year. This action will provide a clear timeline and milestones that will facilitate better resource allocation and project management throughout the year.

After organizing the team's product documentation, the goal is to ensure that all current documents remain up to date, providing the team with a reliable and long-term base of knowledge.

To ensure that the team has sufficient inputs to know if goals are being met and to support strategic decisions, the ongoing tracking of relevant metrics will continue. As new goals are

defined, new metrics will be established and monitored so the team can evaluate performance effectively and identify areas for improvement.

Acknowledgments

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