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AGILE FOR PROJECT-BASED STEM-STUDENTS WORK: "SMALL-SIZE DESCENT VEHICLE"
PROJECT CASE STUDY

Abstract

This paper reviews the experience of Agile-based project management practice implemented into development of the scientific and technical project "Small-size descent vehicle" (SDV) by students and postgraduates of Bauman Moscow State Technical University. The main challenge in organizing the work of undergraduate and graduate students is the possibility for students' integration into project development only during their free time for extracurricular activities. Unfortunately, the methods of work organization in large aerospace industry enterprizes are not suitable for this problem. However, the use of Agile methodology for project planning and development can effectively solve the problem of students' participation by inclusion of project activities in the training program. The Agile software development methodology is a flexible approach to management of IT-product development that is often applied in small teams. Typically, the Agile approach is characterized by working in short iterations of two to three weeks. Within each iteration, a series of tasks are compiled: analysis, design, direct work, testing. After each iteration, the team analyzes the results and adjusts priorities for the next cycle. This approach can be successfully integrated into the organization of STEM-based projects. Using Agile for engineering tasks can seriously improve the development process, risk management, and increase team productivity. Here is an example of Agile adaptation into such a project: 1. Students interact directly with scientific, technical, and engineering customers to best understand their scope and get feedback. As part of SDV development, students do some of the work based on their own communication with experts and faculty. 2. Using short time intervals (sprints) between work supervision, for example, a week. The principle of decomposition is used to limit the task in time, breaking a large task into smaller ones. 3. Using additional planning resources such as interactive project maps, task boards, and an online workspace with access by each student involved in the project. The freeware used in SDV development includes Miro, Yandex.Tracker, and online disks. 4. Conducting general discussions in a hybrid format (online and face-to-face) at the end of each sprint to discuss progress and identify obstacles. 5. Implementation of systems testing early in the development process. Conduct testing of each system or module as it is designed. The application of Agile methodology in the development of student projects in the aerospace industry can result in a more flexible and adaptive process, which is especially important regarding the complexity and variability of such projects.