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## STAGES OF BUILDING AND IMPLEMENTING THE SCRUM METHODOLOGY

## ЕТАПИ ПОБУДОВИ ТА ІМПЛЕМЕНТАЦІЇ МЕТОДОЛОГІЇ SCRUM

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The article analyzes the Scrum methodology and considers its essence. It is proposed to outline the stages of in-depth implementation of Scrum methodology in the company. Taking into account the global tendency to search for innovative solutions to improve the work of workers, reduce costs and use of resources, the introduction of the methodology is proposed as an effective solution to existing problems in the enterprise regarding the creation of a product. Due to the structured information and detailed analysis of all components of the methodology, it was achieved the creation of an effective system that can help enterprises to implement these solutions. The application of Scrum is suggested in order to increase the productivity and effectiveness of the company's employees by recognizing the necessity of forming a small team with the participation of the Scrum Master and Product Owner.

**Keywords:** Agile, Scrum, management, teamwork, project management, flexible methodologies, project, team.

У статті досліджується новітня методологія управління проектами Scrum. Розглядається її сутність та взаємозв'язок з Agile – набір методів і практик для гнучкого управління проектами у різних прикладних галузях, від розробки програмного забезпечення до реалізації маркетингових стратегій, з метою підвищення швидкості створення готових продуктів та мінімізації ризиків за рахунок ітераційного виконання, інтерактивної взаємодії членів команди та швидкої реакції на зміни. Методологія Agile почала зароджуватись у 1990-х роках і стосувалась переважно ІТ-сфери. Алістер Корберн розробив сімейство методологій Crystal, фінальним узагальненням яких став Agile manifesto. Він включає в себе дванадцять принципів, від котрих не можна відхилитися для досягнення мети, та визначає цінність людей і їхньої взаємодії, працюючого продукту, співпраці з замовником та готовності до змін. Таким чином, Scrum – це фреймворк, котрий відповідно використовують задля реалізації Agile-розробки. Сьогодні ця методологія використовується у різних сферах, включаючи менеджмент. Саме тому в статті пропонується окреслити етапи поглибленого впровадження методології Scrum у компанію, яка зацікавлена в здобутті якийсь досягнень – задля зручності та спрощення цього процесу. З огляду на світову тенденцію пошуку інноваційних рішень щодо покращення праці робітників, зменшення витрат та використання ресурсів, запропоновано впровадження методології як ефективного рішення розв'язання існуючих проблем на підприємстві в процесі створення продукту. Завдяки структурованості інформації стосовно впровадження кожного етапу на глибокому рівні та детальному аналізу усіх складових методології, котрі є невідокремленою частиною Scrum, було досягнуто створення дійової системи, яка здатна допомогти підприємствам запроваджувати дані рішення. Для підвищення ефективності та результативності роботи працівників будь-якої компанії було запропоновано створення невеликої команди, переважно з трьох-дев'яти учасників, частиною з яких є обов'язково люди, які прикріплені за посадами Scrum Master та окремо Product Owner.

**Ключові слова:** Agile, Scrum, менеджмент, робота в команді, управління проектами, гнучкі методології, проект, команда.

**Introduction.** The need of innovations has prompted many companies to look for new methods to improve employee performance. It should be noted that management is responsible for the efficiency of the organization's management, because it is its key task as a science. To increase the results, it is necessary to pay attention to the field of information technology, because now it forms the main request for the development of management systems. It is in this area that flexible software development methodologies have appeared and are being actively implemented. Such a flexible methodology is Scrum [1]. Initially, this methodology was used only in the field of IT, but it has also found ways to be applied in other industries, such as management.

**Analysis of recent research and publications.** Theoretical and practical aspects of the methodology Scrum have been extensively studied by such representatives as J. J. Sutherland, Dan Rawsthorne, Ignacio Paz, Geoff Watts and others.

There are professional articles where practitioners talk about their own experience, discussions about difficulties and ways to solve them, or how such problems psychologically burden project participants. There are specialized publications about the difficulties of implementing Scrum in the company's activities, as well as works devoted to the description of the use of Scrum, comments on the mistakes made and the reasons [1]. On the detailed instruction implement of using flexible methodologies, there are, however, hardly any studies.

**Previously unsettled problem constituent.** In recent years, there has been a lot of discussion on how to implement the methodology Scrum into practice. This remains the issue of the methodology's detailed implementation.

**The aim of the article.** The goal of this research is to create a step-by-step and systematic instruction that contains everything needed to implement Scrum. The importance and need of implementing all of the key items is also looked into.

**Results.** "Agile" has mostly been used in software development and IT application development projects throughout the majority of its brief history (since 1999–2000). However, it has now expanded to other sectors, especially in the knowledge and services industries.

Agile is about being responsive to the market and to the consumer by responding fast to their requirements and demands and changing course as the circumstance requires. Agile methods

may be used in any industry where there is a flow of work and delivery of work products, such as IT or software development. Agile approaches aim to optimize customer value delivery while minimizing the risk of developing goods that don't – or don't fulfill – market or customer demands [2].

Scrum is an Agile development methodology based on iterative and incremental processes that is used in the development of software. Scrum is an agile framework that is meant to offer value to the client throughout the project's development. It is adaptive, fast, flexible, and effective. Scrum's main goal is to meet the needs of the customer by fostering a culture of open communication, shared ownership, and continuous improvement. The development process begins with a general idea of what needs to be produced, followed by the creation of a list of characteristics ordered by priority (Product Backlog) that the product owner desires.

Scrum is a natural evolution of Agile Management. Scrum methodology is built on a set of extremely specific practices and roles that must be followed throughout the software development process. A flexible technique rewards product team members that use the twelve agile principles in a context that everyone agrees on. For more details on these principles, see Table 1.

The most important part of Scrum is its structure and steps that are supposed to be taken to make it work (Figure 1).

In the **first phase**, the structure must be organized and people need to be chosen or found. Firstly, at least one person dedicated to a product and that will embody an idea is needed. It would be better to start with BAU (business-as-usual) rather than on big projects. Scrum is starting to be used only when a product selected. Therefore, there is a product and the next step is a Product Owner selection. For the beginning, one Product Owner is enough and this person is responsible for the product and will definitely take into account the risks. Further, must be found a ScrumMaster that will be in charge of assisting the Scrum Team, mentoring and guiding them through the process, and removing any obstacles in their way [5].

The following step is to create a Product Backlog. In its most basic form, the Product Backlog is a prioritized list of items that consumers want to be done to the product. Anything can be added to the Product Backlog by anyone. Scrum is a collaborative and inclusive approach, as are agile development principles

Table 1

**Agile principles**

Name of the principle	Description
Principle 1	Our highest priority is to satisfy the customer through early and continuous delivery of valuable software
Principle 2	Welcome changing requirements, even late in development. Agile processes harness change for the customer’s competitive advantage
Principle 3	Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale
Principle 4	Businesspeople and developers must work together daily throughout the project
Principle 5	Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done
Principle 6	The most efficient and effective method of conveying information to and within a development team is face-to-face conversation
Principle 7	Working software is the primary measure of progress
Principle 8	Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely
Principle 9	Continuous attention to technical excellence and good design enhances agility
Principle 10	Simplicity – the art of maximizing the amount of work not done – is essential
Principle 11	The best architectures, requirements, and designs emerge from self-organizing teams
Principle 12	At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly

Source: [3]

МЕНЕДЖМЕНТ

in general. Nevertheless, most significantly, the Product Owner is the only one who can prioritize the Product Backlog [5]. Items on the Product Backlog, on the other hand, should generally be presented in commercial terms that are useful to the user. Not in the same way as technical duties. Features should be used to express functional needs. The Product Owner prioritizes the Product Backlog items. The priority is determined only by the order in which the items appear on the list. Things near the bottom of the list may or may not get done at all. Things will most likely be hazy at the bottom. If something is a bad idea, the Product Owner should explain why it is being removed from the Backlog to whoever asked it. If something isn't such an awful idea, but is unlikely to be implemented, just put it in its proper low-priority spot on the Backlog and explain to the requester how it fits into the overall priorities. The problem may be solved by making the Product Backlog visible [5].

In the **second phase**, it is vital that the members of the Team who will complete the tasks from the Backlog be able to estimate how much effort they will require. Grooming is the name given to this meeting by the Scrum. These meetings take place at the start of each sprint to

ensure that the Team knows exactly what to do for the next sprint. Each task must be able to be estimated so that the Team can assess its speed and performance. People aren't doing a good job of estimating Backlog tasks in hours or money. "small," "medium," and "large" are examples of relative sizes [5]. Alternatively, use the Fibonacci sequence to assign a point value to each activity [6]. As a result, the Team will be able to reach an agreement quickly. However, you may quantify the task in time units such as hours, days, and weeks. It turns out that a group assessment of a task produces far more accurate findings than an individual assessment, and it might raise some critical considerations for the Product Owner.

In the **third phase**, a Sprint Planning should be discussed. A sprint is a period of time during which a team produces at least a working version of the product. It may then be instantly presented to the consumer. A meeting called «Planning» precedes each sprint or "Sprint planning," in which the team, the ScrumMaster, and the Product Owner arrange tasks for the sprint. Sprints should always have a set duration that is shorter than one month. Typically, one- or two-week sprints are preferred [5]. The Team estimates the amount of tasks that can be done during the

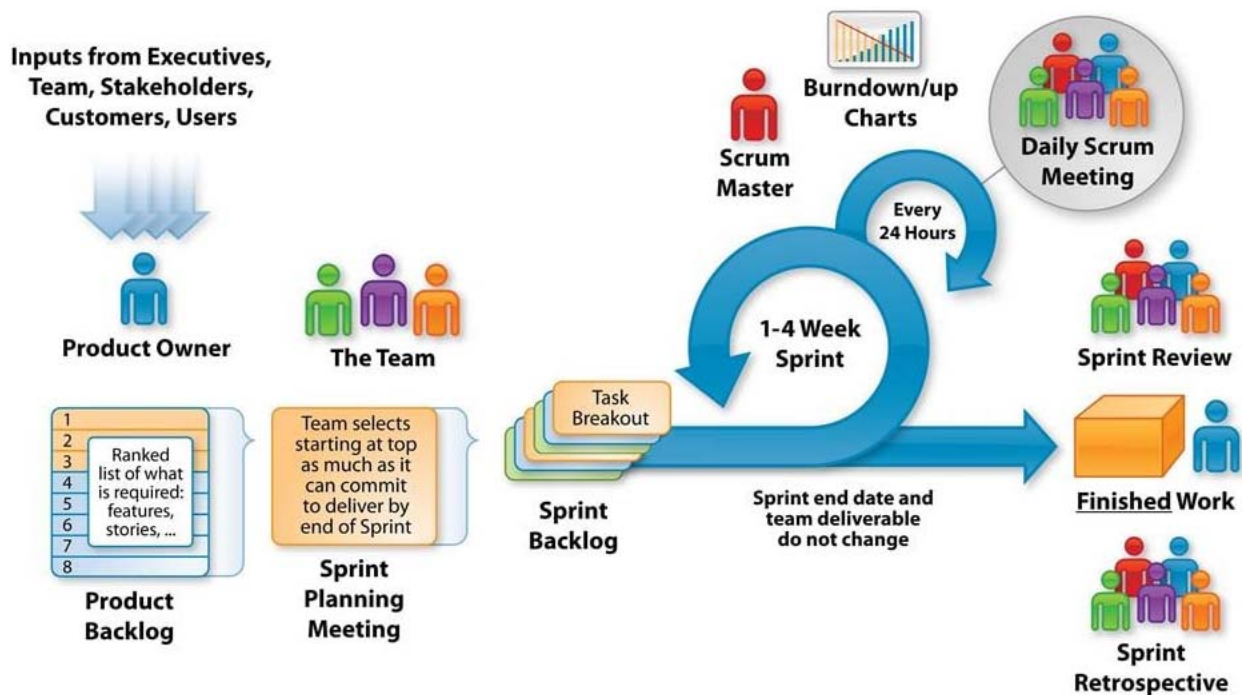


Figure 1. The Agile – Scrum Framework [4]

next sprint starting at the top of the Backlog. If a team has previously completed a few sprints, the amount of points scored in the most recent sprint should be considered. The ScrumMaster and the Team may attempt to raise the amount of points collected in each sprint, but this should be done in a sensible manner. Sprint planning gives the Product Owner and the team another chance to make sure that everyone understands how to complete the tasks. Everyone must agree on the sprint's aim and identify what has to be done at this meeting. New tasks cannot be added to the sprint that is currently running [5].

Giving people independence, respect, and the ability to do their own thing is essential. Ordinary employees, leading experts, and even managers towards the top of the hierarchy are not supposed to know what is going now, what has previously been done, and when it will be done. Because information is the sole guarantee of their power, no information or knowledge may be exchanged. They are primarily interested in their personal interests, which are rarely beneficial to the product or company. All activities and procedures are transparent, ensuring that the goal is met as quickly as feasible. A scrum board with columns labeled "To do" or "Backlog," "In Process," and "Done" is the most typical way to accomplish this in Scrum. The stickers represent the criteria that must be implemented; once they are completed, the team shifts the stickers from one column to the next. Another advantage of

transparency is that Team members can see the quantity of work assigned to them and promptly assist those who are falling behind in attaining the sprint's common objective [5].

In the **fourth phase**, Daily Scrum is important to draw conclusions for previous day. Every day, for no more than fifteen minutes, the ScrumMaster and the Team meet and answer three basic questions:

- What did you do the day before to help the team in finishing the sprint?
- What are you going to do today to help the team in finishing the sprint?
- What are the barriers and problems that are preventing you from doing so?

If it takes more than fifteen minutes, it's wrong. The purpose of these meetings is to ensure that everyone in the team is aware of what task is at what stage of the current sprint [7].

Nobody assigns tasks; the Team is independent and makes its own decisions. Writing detailed reports to management makes no sense so nobody do it.

In the **fifth phase**, the Team shows off what they accomplished throughout the sprint that is called Demo to customer in an open meeting. The complete team is represented in this meeting, along with the Product Owner, ScrumMaster, Team, and any other interested parties, such as the customer, management representatives, stakeholders, and potential consumers. The Team must demonstrate only what fulfills the

concept of «done», what is finally and totally ready. It might be a fully finished product or a single completed function. If it's known that not everything that was planned was done, it means that too many tasks have been selected for this sprint [5].

In the **sixth phase**, everyone who participated in Scrum have a meeting, which is called Retrospective meeting. Everyone sits down and discusses the sprint and what they could modify once the Team has presented what they have done for the sprint and what can be provided to the client for feedback. The ScrumMaster and the team also should create a trusting environment and demonstrate emotional maturity in order to the success of the meeting. The most important thing to remember is that you are not passing judgment on anyone, but rather discussing the process and his or her mistakes. It's important that employees feel like they're part of a Team and take responsibility of their actions and results [5].

In the **seventh phase**, the entire team is on the lookout for solutions. The team members must have some psychological impact so that their conversations are focused on solving the problem rather than determining who is to blame. It is completely unacceptable for even one team member to be compelled to assume a defensive stance because another people blame them; everyone in the group should be able to hear and understand each other. The Team and ScrumMaster should agree on improvements to be implemented in the following sprint before the conclusion of the meeting [8].

In the final **eight phase**, the next Sprint starts immediately. Customer orientation is the most

crucial aspect of this methodology. The customer must receive what he wants on time and with the least amount of work possible. This strategy enables you to create a functional product in a short amount of time with minimal costs. Furthermore, during the course of the project, the Team receives input from the client, which is used to improve the product's functionality and quality. Scrum's main feature is its flexibility. This technique enables the team and the company to respond swiftly to changing requirements and adapt the product accordingly. Difficulties might develop when using Scrum. Firstly, the client is required to participate actively in the project. Secondly, a well-coordinated team effort is required [9].

Scrum is a planning tool that provides some flexibility to directly improve the product.

**Conclusions.** Firstly, there are eight important phases that disclose the principle of implementation of Scrum in company. Understanding each of them allows you to see the whole picture. Of course, these steps are not all that simple in reality. Humans and software development are involved in the steps.

Secondly, the Scrum method is intrinsically simple. Scrum and Agile development may help your success rate in a variety of ways, depending on your situation.

Thirdly, deeper understanding the structure of Scrum is useful. This article will let people examine the Scrum methodology with the help of an article that collects all its key points and, probably, try to implement it. Experience of using Scrum can open the mind and make departments in which Scrum is used more flexible.

#### REFERENCES:

1. Chornyi A. V. (2019) Rol Skram-maistra v rozvytku liderskykh kompetentnosti personalu IT-pidpriemstv [The Role of Scrum Master in the Development of Leader Competencies of the Staff of IT-Enterprises]. *Biznes Inform – Business Inform*, vol. 1, pp. 383–395. Available at: [https://www.business-inform.net/export\\_pdf/business-inform-2019-1\\_0-pages-383\\_395.pdf](https://www.business-inform.net/export_pdf/business-inform-2019-1_0-pages-383_395.pdf). (in Ukrainian)
2. What Is Agile Methodology? Available at: <https://www.digite.com/agile/agile-methodology>.
3. Highsmith, J. & Fowler, M. (2001). The Agile Manifesto. *Software Development Magazine*, vol. 9, pp. 29–30.
4. Kshitij Yelkar (2017) The Agile – Scrum Framework. Available at: <https://www.c-sharpcorner.com/Upload-File/d9c992/the-agile-scrum-framework>.
5. Kelly Waters (n.d.). How to Implement Scrum in 10 Easy Steps. Available at: <https://www.101ways.com/how-to-implement-scrum-in-10-easy-steps>.
6. Using the Fibonacci scale in Agile estimation. Available at: <https://www.lucidchart.com/blog/fibonacci-scale-for-agile-estimation>.
7. Pablo Viola (2019). How to implement Scrum in 7 steps and not die trying. Available at: <https://www.hexacta.com/how-to-implement-scrum-in-7-steps-and-not-die-trying>.
8. 2020 Scrum Guide Changes and Updates Explained. Available at: <https://www.scruminc.com/2020-scrum-guide-changes-updates-explained>.
9. 11 steps of Scrum. Available at: <https://luminousmen.com/post/11-steps-of-scrum>.