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**AGILE AS A KEY CONCEPT FOR IMPROVING BUSINESS AND COMPANIES MANAGEMENT IN GENERAL**

The article contains introductory information about main Agile frameworks such as Scrum and Kanban. It is also shown how they could be implemented in different areas and not only in IT sphere. Comparison analysis is given based on the deep research that was made during the real experience of using frameworks given. The effectiveness of concept implementation is proven by real examples.

**Keywords:** agile frameworks, scrum, Kanban, effective management, business, methodology, economics, flexibility, project management, result orientation.

В роботі викладається базова інформація про основні фреймворки Agile, такі як Scrum та Kanban. Надані рекомендації щодо їхнього використання в різних галузях в доповнення до ІТ сфери. Стаття включає в себе порівнювальний аналіз двох концептів, що базується на результатах багатьох досліджень та власного досвіду їх використання. Наведені приклади застосування концепту Agile в бізнесі та доведена його ефективність.

**Ключові слова:** фреймворк agile, Scrum, Kanban, ефективне управління, бізнес, методологія, економіка, гнучкість, управління проектами, орієнтація на результат.

В работе излагается базовая информация об основных фреймворках Agile, таких как Scrum и Kanban. Даны рекомендации об их использовании в различных отраслях, в дополнение к ИТ сфере. Статья включает в себя сравнительный анализ двух концептов, основанный на результатах различных исследований и собственном опыте их использования. Приведены примеры применения концепта Agile в бизнесе и доказана его эффективность.

**Ключевые слова:** фреймворк agile, Scrum, Kanban, эффективное управление, бизнес, методология, экономика, гибкость, управление проектами, ориентация на результат.

**Introduction:** Since 2000 year, Information Technologies sphere has been sharply developed in Ukraine. Nowadays we can surely say that our country has a very strong IT sector which is considered as one of the most profitable. As a result, many companies starts to change current business needs, views and priorities to the foreign management concepts. Business people see that IT companies are organized in an extremely different way of full freedom, absence of stable borders and strict rules. The most unusual thing is that such policies work and show their effectiveness. Nevertheless and unfortunately, most industries simply are not ready for so valuable changes even though such implementations can help the business to go through the crisis, become more stable and profitable. The article describes the Agile concept, provides with the comparison analysis of two the most popular frameworks such as Kanban and Scrum and shows how they could be implemented in different industries besides the IT sector. The relevance of the issue is also based on the unstable economic situation that became even more noticeable during the last two years. Practical implementation of concepts described can help the business not only to stay alive but even improve the profitability and make the human resource of the company more faithful and affective.

**The analysis of the latest researches and literature** shows that unfortunately Agile concept is mostly described by foreign specialists and quite new for domestic researchers. Popular foreign books are translated into Russian though. For example Robert C. Martin and his 'Agile Software Development, Principles, Patterns, and Practices' is translated on many languages. 'Scrum Guide' – a 'must' for any Scrum Master – created by Jeff Sutherland and Ken Schwaber, is one of the most popular work in the world. It has plenty of publications. Let's also point out that Jeff Sutherland wrote a lot of best-sellers. His

book 'Scrum: A revolutionary approach to building teams, beating deadlines and boosting productivity' explains the fundamentals of Scrum and Agile in general. 'Leading Changes' by John P. Kotter is also very informative book that will help to apply Agile framework in all areas. Let's also take a look at the noticeable domestic works. Wolfson Boris and his book 'Flexible development methodologies' in a very simple way shows how to work according to Scrum. Nevertheless, the analysis shows that most of these books and works are directed to describe how to implement Agile in the software development and doesn't explain how it works in other industries. Therefore, this issue is still open.

**The aim of the article** is to describe how to implement Agile in different spheres in order to improve management effectiveness and business in general.

**Method suggested** to improve the business with the help of Agile concept. Let's shortly describe the key principles of it.

Agile is a flexible, time boxed, iterative approach to product/service delivery that provides project incrementally from the start, instead of trying to deliver it all at once near the end [1]. The key principles are:

- the highest priority is to satisfy the customer through early and continuous delivery of valuable product/service;
  - welcoming changing requirements, even late.
- Agile processes harness change for the customer's
- competitive advantage;
  - delivering of working parts frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale;
  - building projects around motivated individuals.

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Giving them the environment and support they need, and trusting them to get the job done;

- the most efficient and effective method of conveying information to and within a team is face-to-face conversation;
- simplicity - the art of maximizing the amount of work not done - is essential;
- at regular intervals, the team reflects on how to become more effective then tunes and adjusts its behavior accordingly.

It's clear that Agile concept is opposite to Waterfall, where everything must be done strictly according to the rules and basically, nothing can be changed. On the other hand, Waterfall is less risky in some situations.

Let's shortly sum up the main Agile idea. The working environment should be flexible. Workers should have clear vision and understanding of the product/service provided. Teams should be rather small. The project must be divided into equal parts that could show the result (finish) of any process. At the end of each iteration, the responsible person should check the work done and provide the team with a feedback. Workers should share their concerns and ideas how to improve working process. Based on these ideas, the process should be adjusted. Improving – is an important endless process.

Agile is quite complex and general concept that's why people started to separate its sub-frameworks. Let's consider two the most famous of them.

*Scrum.* According to the Scrum Guide, Scrum is a framework that has been used to manage complex product development since the early 1990s. Scrum is not a process or a technique for building products; rather, it is a framework within which you can employ various processes and techniques [2 - from article].

The Scrum Team consists of a Product Owner, the Development Team, and a Scrum Master. Scrum Teams are self-organizing and cross-functional. Self-organizing teams choose how best to accomplish their work, rather than being directed by others outside the team. Cross-functional teams have all competencies needed to accomplish the work without depending on others not part of the team. The team model in Scrum is designed to optimize flexibility, creativity, and productivity [2].

Product Owner is an individual who presents interests of the final consumer (end user) and is responsible for the controlling of the project backlog.

Scrum Master often is a project manager who leads Scrum meetings, coordinates all activities, solves arisen problems and protects interests of the development team.

Scrum team is a group of 3-9 specialists who create a product.

Another essential part of Scrum is a theory, connected with the working process:

Sprint is a time interval for development of the determined limited part of the project. Often its duration is 2-4 weeks.

Backlog is a list of all works (dairy for common use):

- product backlog [a full list of all works needed for the finished product];
- sprint backlog [a list of works from the product backlog for the nearest spring that is determined by the team].

Sprint planning is a meeting of team, product owner and scrum master where everybody discuss and define the

priority of tasks for 1 sprint. As a result, the task list is created. It must be done till the end of the sprint and can't be changed.

Daily scrum is an everyday meeting for 15 minutes where each person describes what he/she has done and what is planned to be done today. So the purpose is to create a plan for the nearest 24 hours and synchronize all activities of the team.

A Sprint Review is held at the end of the Sprint to inspect the Increment (the sum of all the Product Backlog items completed during a Sprint) and adapt the Product Backlog if needed. During the Sprint Review, the Scrum Team and stakeholders collaborate about what was done in the Sprint. Based on that and any changes to the Product Backlog during the Sprint, attendees collaborate on the next things that could be done to optimize value [2].

The Sprint Retrospective is a meeting where the team discusses the last sprint and gives a feedback. It is a possibility to identify problems and develop the plan for the next sprint taking into account argued issues.

So how does the Scrum methodology work?

Firstly, the product owner and scrum master discuss all requirements. They define product backlog, the timeline of sprints and the sprint backlog for the nearest sprint. For the simplifying of the development process and transparency, the Scrum board can be created. On this board at least 3 sections with tasks should be determined: what has been done, what is being done and what plans to be done. The priority can be shown with the help of color stickers. The team members take the task. On the daily scrums (meetings) of the team with a scrum master they discuss the working progress. After 2-4 weeks the sprint review is done. Once a month team gives feedbacks (sprint retrospective). Finally, after all stages the result is delivered to the customer.

Let us consider the Scrum implementation on the real example.

The company "ABC" would like to organize a huge event for its partners and journalists after 2 months. It hires a firm "XYZ" for this purpose. The responsible person from the "ABC" company is appointed an HR manager John Smith. He deals with the representative of the firm "XYZ" Aric Hops and his team of 7 event-managers. In this case:

- product owner – HR manager John Smith;
- scrum master – Aric Hops;
- scrum company – appointed staff from "XYZ" (7 event-managers).

At the first general meeting (scrum planning) they decide to report each 2 weeks (sprint) and define the scope of work for the sprint (sprint backlog). During the meeting, Hops describes that it is not possible to finish all tasks so that the Smith defines those that have the highest priority and the team begins to work on the product. One more important issue that was also discussed in the meeting was a full scope of work (product backlog). So that each party knows exactly what should be done (transparency).

*Kanban.* Firstly this method was introduced by 'Toyota' company. They used this approach as a key production system the main principle of which was to deliver the exact amount of details needed for the specific time. Not more and not less. They created Kanban cards that were a key component. They signal the need to move materials within a production facility or to move materials from an outside supplier into the production facility. The

kanban card is, in effect, a message that signals depletion of product, parts, or inventory [3].

When received, the kanban triggers replenishment of that product, part, or inventory. Consumption, therefore, drives demand for more production, and the kanban card signals demand for more product—so kanban cards help to create a demand-driven system.

An example of a simple kanban system implementation is a "three-bin system" for the supplied parts, where there is no in-house manufacturing. One bin is on the factory floor (the initial demand point), one bin is in the factory store (the inventory control point), and one bin is at the supplier. The bins usually have a removable card containing the product details and other relevant information—the classic kanban card.

When the bin on the factory floor is empty (because the parts in it were used up in a manufacturing process), the empty bin and its kanban card are returned to the factory store (the inventory control point). The factory store replaces the empty bin on the factory floor with the full bin from the factory store, which also contains a kanban card. The factory store sends the empty bin with its kanban card to the supplier. The supplier's full product bin, with its kanban card, is delivered to the factory store; the supplier keeps the empty bin. This is the final step in the process. Thus, the process never runs out of product—and could be described as a closed loop, in that it provides the exact amount required, with only one spare bin so there is never oversupply. This 'spare' bin allows for uncertainties in supply, use, and transport in the inventory system. A good kanban system calculates just enough kanban cards for each product. Most factories that use kanban use the colored board system.

Toyota has formulated six rules for the application of Kanban [4]:

- Later process picks up the number of items indicated by the kanban at the earlier process.
- Earlier process produces items in the quantity and sequence indicated by the kanban.
- No items are made or transported without a kanban.
- Always attach a kanban to the goods.
- Defective products are not sent on to the subsequent process. The result is 100% defect-free goods.
- Reducing the number of kanban increases the sensitivity.

Nowadays Toyota experience is modified and implemented in many different areas. Let's briefly consider how it works now.

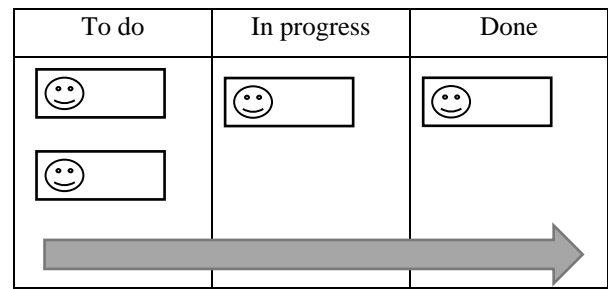
Unlike the Scrum, Kanban has less limitations and rules. Basically, this framework has only 3 attributes:

- Visualize what you do today (workflow): seeing all the items in context of each other can be very informative
- Limit the amount of work in progress (WIP): this helps balance the flow-based approach so teams don't start too much work at once
- Enhance flow: when something is finished, the next highest thing from the full task list is pulled into play.

In order to visualize the workflow Kanban teams use the Kanban Board and stickers that contains names of responsible person for a specific task, the start date (when this sticker was attached to the board), deadline (the critical time when the task must be done), etc. As Kanban is an

Agile framework, definitely each team could customize it according to its needs.

The simplest dashboard looks like the Picture 1 below.



Picture 1 - Kanban Dashboard example

Since Kanban boards create a "picture" of the work, the visual display makes it quicker and easier to understand status and progress. These visual details are displayed in a single place, minimizing the time spent tracking down progress reports or sitting in status update meetings. The Kanban board and cards represent a shared visual language that team members and stakeholders can use to quickly communicate high-value information in a way that is frictionless and transparent.

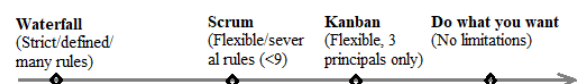
Earlier the explanation how Kanban worked on Toyota system was shown.

Let's compare Scrum and Kanban. Below the comparison analysis is given [3].

Table 1 – Scrum vs Kanban

Kanban		Scrum
No prescribed roles	↔	Pre-defined roles of Scrum master, Product owner and team member
Continuous Delivery	↕	Timeboxed sprints
Work is pulled through the system (single piece flow)	↔	Work is pulled through the system in batches (the sprint backlog)
Changes can be made at any time	↔	No changes allowed mid-sprint
Cycle time	↕	Velocity
More appropriate in operational environments with a high degree of variability in priority	↔	More appropriate in situations where work can be prioritized in batches that can be left alone

According to this data it's clear that Kanban can be considered as more flexible methodology than Scrum as it has less limitations and artifacts. The illustration bellow shows the flexibility of each framework. Waterfall is given just for better understanding.



Picture 2 – The straight line of flexibility

The picture illustrates that Scrum is much more flexible than Waterfall meanwhile it is less flexible than Kanban. Nevertheless,

both frameworks have their limitation so they can't be considered as uncontrolled (as the location of the point 'Do what you want' shows).

**Conclusion.** The economic situation in Ukraine shows that companies should change their direction of management as the old one doesn't work anymore. Foreign concept Agile described, illustrates that flexibility, freedom and only several principals can increase the effectiveness significantly.

To sum up let's emphasize Agile advantages:

- high product/service quality (regular checkups, frequent feedback, etc.);
- high customer satisfaction (client is able to control everything and can make adjustments asap);
- higher project control (each phase can be observed, everything is clear and transparent);
- faster ROI (iterations allow customer to get the work done faster so he/she pays according to each iteration);
- low risks (the shorter iteration – the lower risk).

Statements above are applicable for both framework Scrum

and Kanban. What is better to use depends on the particular situation/project/company so there is no sense to make any conclusions. The effectiveness of both is proven as well as possibility to apply them not only in IT sector.

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