

# AN AGILE METHODOLOGY FOR MANAGING BUSINESS PROCESSES IN AN IT COMPANY

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**Abstract:** Agile methodologies embrace project management methods, techniques and tools that seek to continuously improve products; ensure the agility of project scope, performance of self-organizing teams and the release of quality products. Scrum and Kanban are two of the most popular agile methodologies which IT companies use to develop software products and improve the management of their business processes.

The aim of this paper is to suggest an agile methodology that combines Scrum and Kanban elements and techniques. The methodology has been deployed in the Customer Service Department of an IT company in order to improve team management and optimize the performance of the department. In result of employing the suggested agile methodology to the management of business processes in the department, a high degree of awareness about the progress of ongoing tasks has been achieved.

**Key words:** agile methodologies, Scrum, Kanban.

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## Introduction

IT companies are constantly seeking to improve the services they provide by adapting their management approaches in order to meet customer demands and requirements. Traditional activities of IT companies

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include providing services to customers (software development and operational support), as well as planning and executing internal projects to improve business processes. The development of software products and the optimization of business process are projects requiring the implementation of a framework that will ensure the successful execution and sustainable development of the project. Managing those projects poses a challenge to managers and often determines the successful accomplishment or the failure of a project.

Contemporary business environment is highly dynamic, therefore traditional methodologies cannot ensure agile project management and are difficult to implement in practice. One of the disadvantages of traditional methodologies is that any change in customer needs and requirements disrupts the sequence of the tasks that need to be done, thus affecting the pursued goal and rendering the process difficult to manage. The agile management approach consists of different methodologies and techniques that enable teams to respond to frequent changes in projects in result of new customer requirements and to work on projects without long-term planning.

The aim of this article is to suggest an agile methodology for managing the business processes in an IT company. The methodology combines elements and techniques of two of the most popular agile methodologies for project management and design of information systems - Scrum and Kanban. The methodology has been implemented in the Customer Service Department (Helpdesk) in an attempt to improve team management and optimise the performance of the department.

### **1. Agile Methodologies for Project Management**

Agile methodologies embrace project management methods, techniques and tools that seek to continuously improve products, ensure agility of project scope, performance of self-organizing teams and delivery of quality products. Employing agile methodologies in management helps managers attain goals quickly, reduce risks and create an effective agile work and management environment in which teams can respond to unpredictability through iterations and customer feedback. Agile

methodologies are used to develop software products when the elements and functions of a product are not familiar at the beginning of the project and customers are encouraged to take part in the development process together with software developers.

The two most popular agile methodologies of project management that IT companies use to improve their management processes when developing products and services are Scrum and Kanban.

Scrum is relatively easy to implement and may be used to resolve numerous issues, which software developers face, such as complex production cycles, agile project planning, delayed production of an item, etc. The methodology makes it possible to quickly develop and test software in small project teams.

Schwaber and Sutherland (2016) define Scrum as a framework through which organisations can address complex adaptive problems, while productively and creatively delivering products of the highest possible value. James and Walter (2017) define Scrum as a management framework for software product development that uses one or more cross-functional, self-organizing teams of about seven people each. The framework ensures a management structure with assigned roles, events, rules and artifacts. Scrum uses fixed-length iterations, called Sprints. Sprints are no more than 30 days long. During each Sprint, Scrum teams try to build a potentially releasable (tested) increment. In contrast to the traditional 'waterflow' approach that is based on the perfect understanding of product requirements at the outset and minimum errors permissible at each phase of the project execution, Scrum blends all development activities into each iteration, by adapting to identified changes at fixed intervals. The elements of Scrum are a Scrum team, Scrum events and sprints, and artifacts.

**A Scrum team** consists of a Product Owner, a Development Team and a Scrum Master. Scrum teams are self-organizing and cross-functional. Self-organizing teams decide how to accomplish their work best, rather than being directed by someone who is not a member of the team. Cross-functional teams consist of experts such as business analysts, designers, experts in the subject area and other specialists who have all the competencies to accomplish the work without depending on persons who are not part of the team. The objective is to optimise the flexibility, creativity

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and productivity of the team. During a Sprint, team members develop an intrinsic interest in shared goals and learn to manage each other in order to achieve those goals. The idea of self-organised teams is in contrast with the traditional concept of management. Having a Scrum Master involved increases the probability of project success.

- The Product Owner is responsible for maximizing the Return on Investment (ROI) and for the vision of the product. In terms of management, the Product Owner constantly re-prioritizes the Product Backlog by adjusting any long-term expectations; the Product Owner also acts as the final arbiter on requirements issues and decides whether a product is ready to be released.
- The Development Team is responsible for planning one sprint at a time with the Product Owner. The Scrum Team is independent in terms of deciding how to develop the increment, yet it functions in a highly collaborative environment. Scrum avoids moving people or splitting them between teams. Scrum Teams are most successful when located in one team room, especially during the first few Sprints, and the number of their members is approximately 6 people.
- The Scrum Master is responsible for implementing Scrum and ensures that Scrum goals and principles are understood and adopted by the teams. A Scrum Master creates a favourable environment for a self-organised Development Team; protects the team against external influences or distractions; promotes the improvement of engineering practices. Although not authorized to manage the Development Team, a Scrum Master helps remove any impediments to the development of the product.

**Scrum Events** are used to ensure regularity and to minimize the need for meetings not defined in Scrum. Once a Sprint begins, its duration is fixed and cannot be made shorter or longer. Events may end whenever their purpose has been achieved, provided that an appropriate amount of time is spent without allowing any waste in the process. Scrum events are:

- Sprint
- Sprint Planning
- Daily Scrum
- Sprint Review

- Sprint Retrospective

#### **Sprint Planning**

Before each Sprint starts, a Sprint Planning Meeting is held between the Product Owner and the Development Team in order to identify the elements of the product that will be developed during the sprint (Product Backlog). The Product Owner specifies which elements are of business significance, while the Development Team chooses which of those elements will be developed during the Sprint. A Sprint Backlog is thus created to describe the requirements to the Sprint and the items selected for implementation.

#### **Daily Scrum**

These are 15-minute meetings held by the Development Team at the same time and place every day to check the Sprint progress and to plan their work for the day. Team members exchange information about what they did on the previous day, their plans for the day, and any issues they predict to arise. Issues requiring further consideration may only be discussed after each team member has presented their reports. The Development Team may decide to use a list of current tasks. During the Sprint, new tasks may be identified as necessary to accomplish the Sprint goal. The objective of the Scrum framework is to do away with former habits of working independently, therefore team members need to be very careful not to allow any instances of a similar approach.

#### **Sprint Review Meeting**

Scrum Teams also hold a meeting at the end of each Sprint to review progress. During a Sprint Review, attendees collaborate about what has been done and the Product Owner reviews selected items of the Sprint Planning Meeting to evaluate which of them have been accomplished. Items that have not been accomplished are included in the new list to be prioritized as elements of future Sprints. It is the role of the Scrum Master to help the Product Owner and the end users of the product transform their feedback into new requirements, which will then be prioritized by the Product Owner. New requirements may frequently go beyond the scope of the project. When this is the case, the new scope of the project may totally replace the old one, should the Product Owner find the new scope to be more important than

initial expectations. A Sprint Review Meeting may be attended by external stakeholders, and even end users.

### **Sprint Retrospective Meeting**

Each Sprint finishes with a Sprint Retrospective Meeting at which the Scrum Team reviews its performance and designs a plan for improvements during the next sprints. A good retrospective meeting requires a favourable psychological environment that excludes any elements of hostility or destructive criticism. In most organisations, however, it is difficult to ensure such atmosphere. Some of the major impediments to ensuring complete transparency at Sprint Retrospective Meetings is the presence of people who evaluate the implementation of the project. It is the role of the Scrum Master to facilitate the establishment of a positive and constructive atmosphere within the organisation by employing various techniques, such as silent writing, satisfaction histograms and setting deadlines. The overall objective of a Sprint Retrospective Meeting is to ensure common awareness about numerous points of view and to initiate actions that will help the team continue the accomplishment of tasks.

### **Backlog Refinement Meetings**

During each Sprint, Scrum teams spend some time to refine the Product Backlog. The Meeting is attended by the Scrum Team and the Product Owner who approves and refreshes the Product Backlog.

### **Artifacts**

Scrum Artifacts are those items of the methodology that provide transparency and opportunities for inspection and adaptation. Scrum Artifacts are designed to maximise transparency of key information so that everybody has the same understanding about the artifact. Scrum Artifacts include:

- *Product Backlog* – describes the requirements to and the elements of the product and lists the desired functions, ranking them according to their priority. The Product Backlog is available to all stakeholders so that they could add elements to it. The Product Owner is responsible for arranging the contents of the Product Backlog.
- *Sprint Backlog* lists the requirements to and the contents of each Sprint and consists of selected items of the Product Backlog which the Scrum Team and the Product Owner have agreed on during the

Sprint Planning Meeting. Any changes that could jeopardize the accomplishment of goals are unacceptable during the Sprint. Primary goals are set by the Scrum Team during the Sprint Planning Meeting.

- *Increments* are usable and feasible versions of the Product after the end of each Sprint. They are inspected at each meeting in order to supervise the work that is done during a Sprint.

**Kanban** is an agile methodology, which had its origin in Toyota's factories during the 1940s. Initially, it was a visual system of cards ('kanban') used by a department to signal that it can produce more than the capacity defined for it. Nowadays, project teams present their tasks visually by using notes and white boards (although there are also virtual versions that may be used online) and move them along certain stages that have been set in advance in order to monitor progress and identify potential bottlenecks.

When used in software development, Kanban employs the stages in the lifecycle of software development. The aim is to control and manage the flow of functions (presented by Kanban cards) so that the number of functions that enter a process could equal the number of functions that are completed.

A major concept of Kanban methodology is Work in Progress (WIP). This is a measure of the work capacity maintained by the development team with a focus on the quantity of work at a given moment. Some of the advantages of using Work-in-Progress include reducing the time for awaiting completion; avoiding the occurrence of resource issues during the work process; identifying bottlenecks in the development of a certain element during the work process; resolving teamwork issues and reducing dependencies in the implementation of tasks by dividing them into subtasks that are tracked independently.

In contrast to Scrum, Kanban does not prescribe roles. Kanban is a challenge to organisations that have been using waterfall methodologies and are willing to change but are apprehensive of the initial cataclysm which using Scrum may cause.

Kanban uses 'visual charts', 'boards' or 'billboards', 'signaling systems' to label the work process limited in WIP.

The underlying principles of Kanban are:

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- **Workflow visualization**—dividing work into specific tasks or states, which are visualized in columns on a board. Each task is shown on the board and assigned to the column corresponding to its state in the workflow.
- **Limiting Work in Progress (WIP)**-defining explicit limits to the number of tasks, which can be done during each state of the workflow. The amount volume of work in progress is limited for each state.
- **Measuring Lead Time**-the amount of time from the creation of a task to its completion. Lead time is measured to optimize workflow and make it as fast and predictable as possible.

Kanban ensures improvements to the workflow by representing it visually. This is achieved by creating boards with clearly labeled columns and Kanban cards to denote the state of each element of the work process at a given point of time. When a certain task requires longer time, work on it can continue, while the tasks that have already been done will be forwarded to the next state.

The advantages of organising the work process in this manner include providing sufficient time for longer tasks that may not be divided logically and ensuring the continuous doing of tasks without delays. Those advantages render planning agile and adaptive.

When some work is shared by two teams and one of them is doing better than the other, the better team is likely to be working harder or faster than the other team. This may give rise to conflicts between teams. In such cases, the Kanban approach is to add a limited capacity buffer between the two teams (Pull Approach), the second team only working on tasks when ready to do so. This helps teams avoid accumulation of work, reduces the time for awaiting completion and makes it easier to maintain a constant work pace, the focus of the team being on quality. An essential feature of Kanban is minimizing the work cycle of each task and its optimization through metrics. This helps identify issues and have them resolved immediately. Corrective measures employed after resolving problems reduce the effort required to redesign a task.

Workflow in Kanban is organised and visualised through a Kanban board and charts. The Kanban board is used to present the flow of tasks during the work cycle by ensuring easy access to those items to all participants in the project, by facilitating communication and visually tracking



the progress of tasks and identifying problems as soon as they arise. Furthermore, a Kanban board is used to measure work cycles and optimise lead time by eliminating unnecessary work.

Cumulative Flow Diagrams (CFD) visualize the current state of tasks and the speed at which other tasks are being done. A diagram is used to show the number of tasks in each column every day. Cumulative Flow Diagrams indicate the effectiveness achieved so far and make it possible to predict future results.

Table 1 presents a comparison between the two agile methodologies.

*Table 1  
A comparison between the two agile methodologies*

	Scrum	Kanban
Application	Software development	Operational support (helpdesk)
Iterations	Yes (Sprints)	No
Product release	At the end of each Sprint upon the discretion of the Product Owner	Constant development
Teams	Cross functional	Specialised
Prescribed team roles	Product Owner Scrum Master Development Team	Does not prescribe any roles
Teams cooperation	Intense cooperation on each backlog item	Cooperation for accomplishing the project goals
Change management	Changes can only be made at the beginning of a new Sprint.	Prompt response to any change.
Meetings	Planned meetings	No meetings required
WIP	Limited per Sprint	Limited per workflow state
Who determines the WIP	Product Owner	According to assigned roles (if any)
Product backlog	Listed prioritised items	Board cards
Visualisation	Board, product backlog, sprint backlog	A board to visualise the process
Managing bottlenecks and work impediment	Addressed immediately	Avoided

Scrum splits work into small tasks that could be done within a Sprint. Planning, development, evaluation and execution activities are limited to specific small deliverables, which accelerates the completion and release of

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major backlog items. This renders Scrum suitable for working on software projects.

Kanban splits work into even smaller items to ensure a continuous work process, while the concept of Sprints is not used at all. Similar to Scrum, project teams that use the Kanban methodology work on top priority items, yet, an item may be released as soon as it gets done, sometimes within hours. This renders Kanban extremely suitable for activities that relate to customer service.

### **2. A Flexible Methodology for Managing the Customer Service Department (Helpdesk)**

The flexible methodology for managing the business processes we propose in this paper has been designed to improve the performance of the Customer Service Department in IT companies with small department teams without an established system for managing customer service.

Figure 1 illustrates the structure of an IT company with four departments – IT, Sales, Customer Service and Management.

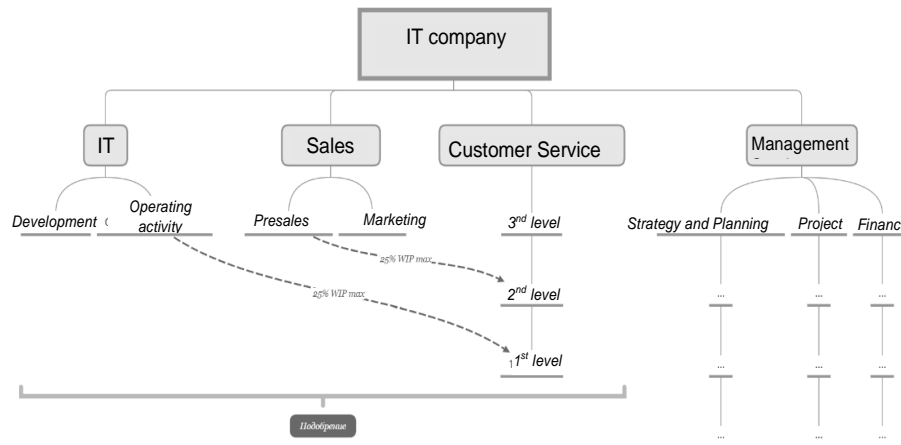


Figure 1. Structure of the departments within an IT company

Frequently arising issues at the Customer Service Department may be grouped into three categories: organisational ones; issues related to the quality of service and issues related to employees' workload.

The company receives customer feedback through various communication channels – e-mail, phone calls, web forms. Those channels are operated by different members of the same team. Customer service may be done at three levels:

- The first level deals with all incoming customer enquiries and has the general information required to help customers;
- The second level deals with specific enquiries related to the use of services; in most cases, customers are not familiar how to use a particular service and open tickets of inactive services;
- The third level of customer service assists in diagnosing and resolving issue that have not occurred previously and which the second level of customer service is not prepared to deal with.

Unless a company has an established system for running customer service, businesses tend to review new customer feedback in the order of customer significance to the company. If a customer complaint does not indicate a possible crash of the operating system or has been submitted by customer whose significance to the company is low, it may be reviewed with a serious delay in time. Furthermore, the level of customer services may be specified in an auxiliary Service Level Agreement (SLA) to the service contract. In that case, the company needs to ensure that it will fulfil the commitments it has made in the agreement. This may include meeting a deadline for responding to arising problems, taking the necessary steps to resolve the problem and resolving it.

In order to guarantee the quality of service that has been negotiated in the SLA, companies design 'escalation matrices' or rules according to which if a team is not able to resolve a specific problem, the complaint is automatically 'escalated' to the next level. Another major issue of customer service is the lack of information exchange about submitted customer complaints. Customers often fail to provide additional information about their problem, some queries (support tickets) thus 'freezing' in time. Such cases are hard to monitor, unless there is a system for organizing the flow of queries and reported issues. The lack of a system that registers and tracks

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support tickets results in team members being differently informed about current and new issues.

The methodology we suggest for managing customer service (helpdesk) aims to:

- Ensure a continuous task flow without iterations (Sprints);
- Facilitate communication in teams and guarantee continuous improvement of team work;
- Improve customer service, i.e. reduce the time for responding to queries, by limiting the number of issues, which are dealt with simultaneously.

The model employs techniques from the two project management methodologies, Scrum and Kanban, and is presented in Figure 2.

- WIP Limit - maximum 2 members from a team (Kanban);
- Daily meeting (Scrum);
- Retrospective meeting (Scrum);
- Forecasts and diagrams of planned project work (Scrum).

Instead of Scrum Sprints, the model uses Kanban WIP Limit to ensure a continuous task flow. In order to improve service by reducing the time for response, a limit is set on the number of tasks that are to be implemented in parallel. Each team has a specified number of members working on tasks. Each member team works on one task only and has a spare task, in case their work on the first task gets blocked at some point. The initial value of the WIP Limit is determined by the formula  $WIP\ Limit = 2 \times \text{the number of members}$ . The Head of the team is responsible for prioritizing tasks and for their daily assignment. Team members hold a Standup Meeting every morning to consider priorities and assign tasks individually. Retrospective Meetings are regularly held to assess achieved progress and possible improvements.

The main board has three columns: a list of items on which work has not started yet (Backlog); items which are currently being worked on (WIP), Completed items.

Incoming items from all communication channels (e-mail, web-forms, and phone calls) are entered into a common list of Backlog items, which is an element present in both Scrum and Kanban.

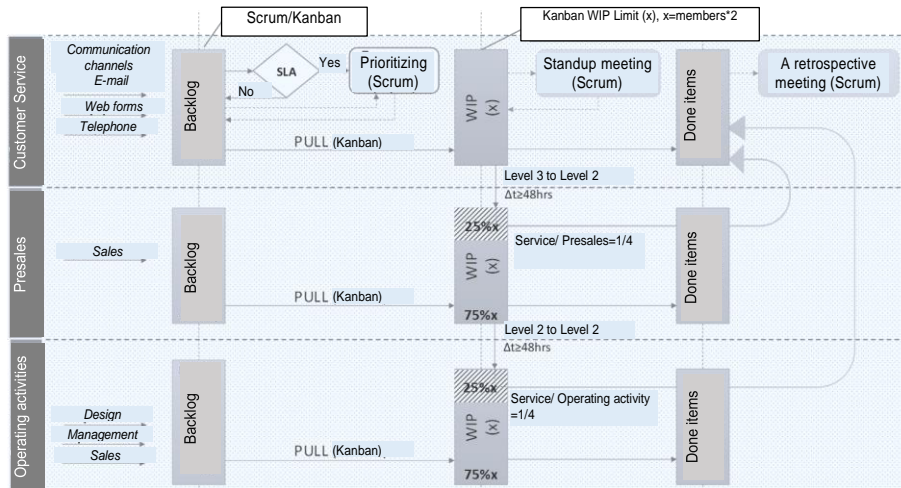


Figure 2. A flexible methodology for managing the Customer Service Department

The team places all current items on the board and a transition from 'multiple tasks on which the team works simultaneously to have a few tasks completed' to 'a few tasks on which the team works simultaneously to have many tasks completed' is made. A WIP Limit =8 is introduced that will result in changing the appearance of the board. By setting that limit, the team is able to focus on top-priority items (if they have been prioritized) and thus have a higher number of items completed. When the number of items on which the team is currently working is lower than the WIP Limit (the number of team members  $\times$  2), there will be a free slot in WIP and any team member may choose an item from the Backlog list with consideration of the priority assigned to them. Starting work on a Backlog item when there is a free slot is known as the PULL method and is an element of Kanban methodology. Team members are thus able to start working on a new item and do not have to wait for the expiry of a certain time period or having all WIP items completed (as it is with the PUSH method in Scrum).

When the WIP Limit is completed, a Scrum Standup Meeting is held, its maximum duration being no more than 15 minutes, to discuss the items that have not been completed yet, without going into details about those items. When an item is done, it is moved to the Completed items column. Teams hold regular

Scrum retrospective meetings to discuss resolved issues. If a team is unable to resolve a problem and an item remains in the WIP column too long, a standup meeting is held to escalate the item to the second-level team. A new Backlog item can thus be moved to the WIP column.

Setting an appropriate value for the WIP Limit is essential for ensuring an acceptable response and delivery rate. Having too many items in the WIP column makes it impossible to work on new items. This should be avoided as it would disrupt the workflow.

In general, work processes in Pre-Sales and Operating Activity are similar to those in Customer Service. The difference is in the manner in which Backlog items are selected. Pre-Sales use a 'first-in-first-out' (FIFO) queue, while Operating Activity use a 'last-in-first-out' (LIFO) stack. It is usually the responsibility of Pre-Sales to consult customers upon the purchase of new services. It is therefore essential to keep the response rate high and minimize the number of factors that could cause delays. Hence, the best strategy for drawing items from the Backlog is to apply the FIFO principle.

Operating Activity are responsible for the proper performance of corporate infrastructure. Customers are directly affected by any disruptions in the provision of services or the occurrence of another problem, therefore the major objective of the team working in that department is to resolve such issues as soon as possible. Hence, the best strategy is to apply the 'last-in-first-out' principle when choosing Backlog items.

The IT company in our case study does not assign the responsibility for serving customers at level 1 and level 2 to specific employees. Instead, the Pre-Sales team provides support at level 2, while the Operating Activity team provides support at level 1.

Adopting the option to free WIP Limit by escalating items to another team makes it possible to transfer tasks between teams. Level 3 often tend to transfer items to Level 2 instead of taking the effort to resolve the problem. Therefore, a time limit of  $\Delta t \geq 48$  hours is introduced so that an item can be transferred no earlier than after staying in the WIP Backlog for 48 hours. The same limit applies to escalating items from Level 2 to Level 1.

Despite the restrictions set on the means of escalation, it is possible to accumulate items, which have been transferred from WIP Customer Service to WIP Pre-Sales or WIP Operations, thus filling their WIP Limit and obstructing the normal activity of the team (Pre-Sales or Operating Activity).

In order to ensure the normal capacity for transferring items that have initially been allocated to Pre-Sales/Operating Activity, their WIP Limit is divided in two at a 1:4 ratio, which means that 25% of the capacity may be used for transferred items, while the other 75% of the capacity is reserved for the items that the team must do. Teams will thus not be delayed in doing their main work and will be able to adequately fulfil their obligations.

When a new item is received from Customer Service, it may not be prioritized correctly, for example, when there is a customer complaint about a problem that has little impact on the provided service. At the same time, that service may be part of a contract to which a Service Level Agreement (SLA) has been signed and therefore require immediate attention. A special procedure for inspecting customer SLA is then started and the item is prioritized according to the findings of the procedure.

### **3. Implementation of the Methodology**

The suggested methodology could be implemented via a traditional board or through software. When a traditional board is used, it should be placed in a room that is accessible to everybody so that meetings could be held where the board is. The advantage of this approach is that enables participants to get awareness about the current state of a project by merely looking at the board. It is more difficult to constantly update the contents of the board, though, since it is impossible to attach additional information to each card. Therefore, this approach is more suitable for designing schedules or for different production processes than for tracking the activities at a department. The software implementation of the methodology ensures some advantages to teams whose members are at different physical locations. A virtual board is used, thus allowing for more frequent updates and entering a larger volume of data, if necessary. All team members have constant access to the full contents of the board. It is also possible to set deadlines and enter any other information and meta data that are relevant to the cards.

The suggested methodology is implemented through a system with a web application that is accessible to all teams in the three departments. Figure 3 shows a screenshot of the list of Backlog items, with an option to add new items or to prioritize a specific item.

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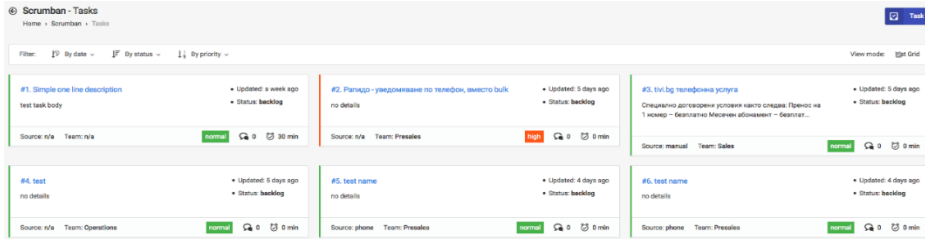


Figure 3 A screenshot of the Backlog items

Figure 4 presents a general and a detailed diagram of tracking several metrics about real-time work on items.

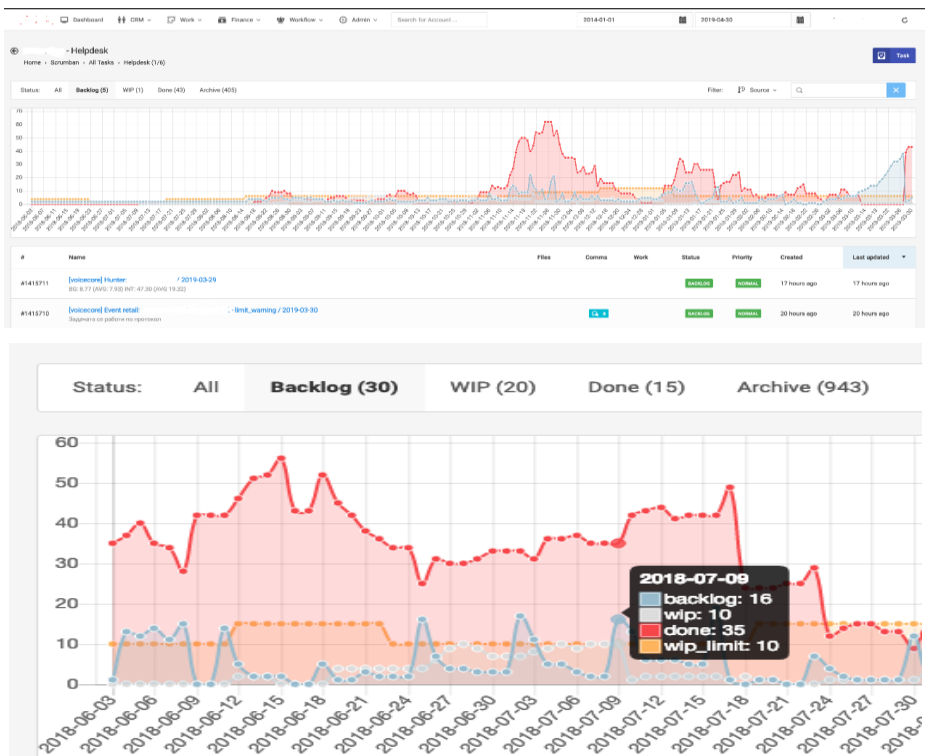


Figure 4 A screenshot of the diagrams for managing items



The red curve indicates the number of done item; the blue one - the number of Backlog items; the orange curve shows the WIP Limit, while the grey one indicates Work in Progress (WIP). On 9<sup>th</sup> July 2018, for example, the number of items in WIP was 10, the WIP Limit being 10, and the number of Backlog items was 16. The number of done items was 35, calculated for the 7 days preceding the date of the analysis.

The chart is used to:

- Monitor and analyse work on items and the capacity of teams;
- Identify problems and bottlenecks arising during work on items;
- Support managerial decision-making with reference to hiring new employees and optimizing the performance of the department.

In result of employing the suggested agile methodology for managing the business processes at the department, a high degree of awareness about the progress of opened tasks is ensured. Team members thus have an instrument that enables them to prioritize the item they will be working on.

Reaching the WIP Limit clearly indicates which issue causes problems and hinders work on the other items. The entire team can thus focus on resolving the problem and doing the task that has caused it. At the same time, maintaining an optimum low value of the WIP Limit ensures fast response and starting work on a new item. Furthermore, the use of the PULL system in organizing the work process guarantees accomplishing results quickly and starting work on the next task. Uniform recording of information in a common system ensures that all team members use 'a common language of communication'. All employees working on a project are familiar with the system and are aware of the meaning of each entry. This enables participants to plan their work and predict further steps. The accomplishment of a task requires conformation by the customer. An item can only be closed after receiving a confirmation by the customer. Should a team member close an item without meeting customer requirements about quality, the customer will not confirm or accept the item, which will result in keeping the item in the WIP column for too long. In this case, the entire team will focus on doing the item successfully. Even if the team fails to do so, the item could be escalated

to a more competent team. The manner in which the work process is organized will thus guarantee that customers will receive what they expect and will not be disappointed. The system also renders it possible to make a correlation analysis of customer feedback and employee performance in order to appraise the performance of a particular team member.

### **Conclusion**

The suggested agile methodology for managing business processes ensures techniques and instruments for optimizing the business process at a department, yet, it can also be employed in other departments where speed and excellent communication between teams are essential. The methodology provides tools to monitor the accomplishment of tasks, to identify problems and bottlenecks in real time and to facilitate managers' decision-making in terms of team performance.

The employment of agile methodologies in the management of business processes helps businesses adapt to unpredictable changes, optimise their business processes and hire highly qualified employees who work effectively in a collaborative environment. Companies tend to have high expectations about agile methodologies and frequently fail to understand the philosophy of their implementation. A typical example is the management of a company trying to fit the principles of agile methodologies into the organizational hierarchy, which does not produce the expected results. The employment of agile methodologies is not a fast process with immediate results and always helps identify covert problems, such as insufficient resources, for example. A failure to resolve those problems often makes project managers give up agile methodologies. Having the principles of agile methodologies understood and adopted by both managers and employees is a key factor to the successful implementation of the changes that agile methodologies bring in organisations.

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