# BPM in Digital Transformation: New Tools and Productivity Challenges

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**Abstract.** Digital transformation (DT) has brought an unprecedented pace of change. At the same time, it has also created an environment where knowledge workers have to deal with an increasingly Volatile, Uncertain, Complex, and Ambiguous (VUCA) workplace. In this scenario, the design, development, implementation, execution, and evolution of business processes have changed in the last years. In this tutorial, we cover two consequences of these changes that deserve special attention for the impact they can have in the near future: (i) the new tools being used to support the execution of processes, and (ii) the human aspect of process execution since in this new context -multiple changing processes executed in parallel- productivity challenges appear that affects directly process performance. We illustrate how these new tools are used to manage processes, and the challenges to be addressed for research and practice using real case studies extracted from empirical studies (+1500 participants) and transfer projects with +14000 direct users affected from SMEs and international companies in different sectors (commodities, engineering, manufacturing, banking, retail, etc.) using the productivity methodology we have developed for addressing those projects: The FAST Productivity Methodology.

**Keywords:** Business process management · Collaborative work · Productivity · Digital transformation · Work stream collaboration tools · Board-based tools

## 1 Introduction and Motivation

Digital transformation is changing the way we work and do business. Although it presents an opportunity to use technology for improving productivity, many new challenges have appeared in the last years [18] mainly derived from the Volatile, Uncertain, Complex, and Ambiguous (VUCA) environments in which businesses are immersed today [3]. Those changes affect how processes are managed and implemented, from their design to their monitoring and optimization, challenging traditional approaches to BPM [2].

Among others, there are two factors affecting processes that are especially relevant: (i) the popularization and generalization of a new category of tools

that can be used for implementing processes: Work Stream Collaboration Tools (WSCT) such as Microsoft Teams or Slack, and Board-Based Tools (BBT), such as Trello or MS Planner [10,12]; and (ii) the human aspect of process execution since in this context - with multiple changing processes executed in parallel with unstructured work - new productivity challenges appear affecting directly process performance.

WSCTs are highly flexible and configurable tools that allow a team of knowledge workers to perform online conversations, file sharing, and collaborative task management, amongst others. This flexibility has proven to be beneficial to executing the growing number of unstructured and continuously changing work processes performed by organizations nowadays [5].

Regarding the human perspective of process execution, process participants execute multiple processes in parallel using the aforementioned tools, email, or other information systems. They are constantly making decisions about which tasks or processes to prioritize, they have to deal with information overload, and they are affected by interruptions and their motivation [18]. This situation creates severe challenges for the productivity of knowledge workers that directly affect process performance and hence, need to be addressed like other aspects of process performance.

In this tutorial, we first detail WSCTs and BBTs and how they can be used to execute business processes (cf. Sect. 2). Then, we discuss the human perspective of process execution and which productivity challenges can negatively affect the productivity of BPs (cf. Sect. 3). Later, we report on some solutions for the main challenges and real case studies derived from our experience applying the FAST Productivity Methodology in many projects with SME and big companies reaching more than 14,000 users (cf. Sect. 4). Finally, we discuss the implications for future research and practice (cf. Sect. 5).

## 2 New Tools for Executing Processes: WSCT and BBT

Traditional BPM software systems (BPMS) for executing and managing processes usually require a software team that elicits the requirements and implement software to manage the processes. This is a long process that makes the evolution of processes difficult. However, in a VUCA environment, processes change very rapidly to adapt to the changes in the business. This problem, which has also been identified in the context of digital transformation, causes software cannot keep the pace of changes and becomes obsolete before being useful [2]. In contrast, WSCTs and BBTs provide flexible tools for collaborative work that are intensively used to manage formal and informal processes. The processes managed with these tools are usually subject to frequent changes or are not yet implemented with traditional BPMSs.

Thus, when implementing processes, we must consider two new categories of tools: WSCT and BBT. On the one hand, WSC is a concept coined in 2018 that refers to "products that deliver a persistent conversational workspace for group

collaboration and can be arranged into public or private channels (often organized by topic/project)" [9]. These tools are designed to improve team coordination, performance, communications, and productivity [12]. This emergent class of collaboration technology can combine a diverse number of features, including instant messaging, calls, optimised search, (shared) calendars and notifications, real-time document collaboration, task managers, and cloud storage with version control, amongst others. They also typically integrate with other enterprise applications and bots and can be accessed on mobile or desktop devices. Thus, WSC tools are very powerful and flexible but need rules and methodologies to be correctly used [7]. However, there is neither previous experience nor a strong research body that offer guidelines to design good solutions based on WSCTs [18].

On the other hand, BBTs such as Trello or Planner are structured around boards that contain cards organized in lists. This structure allows users to organize a wide variety of formal or informal information and work processes flexibly. For instance, cards can represent process instances, and their evolution can be implemented by moving cards between lists. In addition, these tools can be integrated into WSCTs, complementing informal communication with a more structured definition of work processes. The flexibility of BBTs means that in every situation, the user is required to design new boards from scratch, which is not a straightforward task, especially for non-technical users. To alleviate this problem, in [16], the authors developed 8 BBT design patterns, from which four are devoted to processes helping users design the board for different purposes.

## 3 The Human Perspective of Process Execution: Productivity Challenges

Although these new tools allow a new flexible and rapid way of implementing processes, the human perspective of its execution also presents many challenges. Today, knowledge workers perform not only structured work defined by processes but also structured work in the form of projects, unstructured or uncertain projects, and unplanned work. The work in this last category usually reaches the worker through unexpected interruptions, emails, or instant messages. Thus, structured work of processes must compete with interruptions for workers' attention. This means that a very well-designed process can have inferior performance if the participants have, for example, a high number of interruptions.

Consequently, for process improvement, it is necessary to monitor, analyze, and improve the situation not only from the process perspective, but also from the worker's perspective. There is already some work headed in that direction. For instance, Pika et al. [17] describes a framework for analyzing and evaluating resource behavior like utilization, preferences, productivity, or collaboration patterns through mining process event logs. Palvalin [15] introduces a conceptual model of knowledge work productivity, which consists of two significant elements: work environment, which includes physical, virtual, and social environment, and knowledge worker, which includes individual work practices and

well-being at work. Finally, in del-Río-Ortega et al. [18], the authors perform an empirical study with 365 knowledge workers that were using WSCTs from three companies. The result is a set of 14 productivity challenges, namely: interruptions, prioritization/goals, organizational coordination, planning/task management, work overload, lack of knowledge, email management, volatility, lack of focus, bureaucracy, meetings, software, motivation, and information overload.

## 4 Solutions to Focus, Achieve, Sustain and Target

As a result of analyzing the solutions to those 14 challenges and our industry experience applying them, we organize the solutions we must take into account for improving productivity and managing processes in four main principles corresponding to the letters F.A.S.T. as follows:

- **F**: *Focus*: In an environment with rapid changes we need to define, review, and rapidly update priorities. To achieve this, agile methods using BBTs to implement a *business compass* can be used. A *business compass* provides a dashboard where the priorities between processes/projects or individual goals/responsibilities are represented and periodically reviewed [5,8].
- **A**: *Achieve*: In a context with many tasks from different sources, unplanned tasks, steps of a process, or tasks from collaborative projects, workers need a reliable storage that collects all types of individual and collective tasks. This storage is usually called an *external brain*. Workers also need methodologies to coordinate work (planning, synchronization, and retrospectives), mainly agile methods. Both storage and method help systematize and give order to the communication between workers using WSCT [4–6].
- **S**: *Sustain*: The amount of information received nowadays is very high. In this context, for maintaining the path towards our goals, it is mandatory to filter inputs to focus on what is important for the business, automatically (email rules, or AI filters) and manually, deciding and registering the work to be done in the *external brain* [1]. In addition, humans are not machines, for sustaining motivation and productive energy, workers must nurture their lifestyle (sleep, exercise, eating, etc.) and implement tools to control work stress such as creating task lists or systematizing decision-making [13].
- **T**: *Target*: In the context of an elevated number of interruptions, we need tools to improve concentration. For that, we can use a tool called the *concentration bubble* that consists of time and space boxing (blocking time in the calendar and switching off communication) to create organizational spaces free of interruptions for doing focused work [11,14].

Figure 1 shows the relation between the 14 productivity challenges described in [18] and these four principles. Green cells with an "x" indicate that the principle at hand includes tools that significantly address a challenge. Grey cells with an "~" indicate that the principle includes tools that partially contribute to solving the challenge. As seen in the table, all challenges are covered by at least one principle.

| Challenges /Principles | Interruptions | Prioritisation/goals | Organisational coordination | Planning/task management | Work overload | Lack of knowledge or training | Email management | Volatility | Concentration/focus | Bureaucracy | Meetings | Software | Motivation | Information overload |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Focus | ~ | x | ~ | ~ | ~ | | | ~ | ~ | | | ~ | x | ~ |
| Achieve | | ~ | x | x | ~ | | ~ | x | ~ | x | x | ~ | x | |
| Sustain: Filter | x | ~ | | | x | x | x | ~ | ~ | | | ~ | ~ | x |
| Sustain: Energy/ lifestyle | | ~ | | ~ | ~ | x | | | ~ | | | ~ | x | |
| Target | x | ~ | | ~ | | | | | x | | | ~ | x | |

**Fig. 1.** Relation between challenges and the FAST principles

Based on these principles, we have developed *The FAST Productivity Methodology*[1] to apply them. This methodology has been successfully used in many projects of digital transformation of SME and international companies, reaching more than 14,000 users.

## 5 Conclusions and Future Research Challenges

Knowledge workers in VUCA digitized environments have developed new ways of working and executing processes. In addition, current digital transformation environments and tools bring new productivity challenges directly affecting process performance. In this new context, there are two main conclusions for future research:

- The use of new tools to run processes. These new tools, although flexible, can be structured to execute processes. Further research is necessary to design, monitor, and manage the evolution of processes in those tools.
- The importance of the context of process participants. Users are usually executing multiple processes in parallel together with other unstructured work. This forces them to continuously decide which tasks or processes to prioritize and creates constant interruptions that affect their workflow. Dealing with these productivity challenges has an impact on process performance. Therefore, further research is necessary to detect, analyze and resolve these productivity challenges. Furthermore, the context of process participants should be considered for process (re-)design, monitoring, and execution management.

[1] www.fastproductivity.com.

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