

SOFTWARE BUSINESS PROCESS MANAGEMENT APPROACHES FOR DIGITAL TRANSFORMATION

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Introduction

The evolution of existing technologies and the emergence of new technology has become our way of life. Nobody is surprised anymore by the emergence of new products that rapidly change our lives as well as our business activities. Competitive companies chase each other, trying to first deliver the new step in technological evolution. The increasing effects of globalization should also be considered. Globalization can be very helpful to business companies, giving them the opportunity to greatly increase their market, but it also would raise significantly the level of competition. And in this dynamic environment millions of companies all over the world must meet daily challenges in order to keep up with the competition and be successful.

To respond to the rapid change in the environment, companies would undergo a series of technological changes, described today by the term digital transformation. Digital transformation is defined not only as a technological shift but also as an "organizational change at the intersection of technology, business and people" (Newman, 2018).

But where should the organizations start to implement the organizational change? The author believes that one of the most important fields for digital transformation are the business processes of the organizations. If an organization would like to improve its business processes it should look into the business process management discipline, methodology and technology. This research is focused on the evolution of the business process management technology and whether BPM can be a solution to help achieve digital transformation.

Digital transformation – what it is and what is coming

According to George Westerman (George, Bonnet & McAfee, 2014), cited by Clint Boulton (Boulton, 2018), digital transformation represents a radical rethinking of how an enterprise uses technology to radically change performance. The authors above also emphasize that the need for digital transformation is not

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limited to specific industries only but to all industries. In his article Clint Boulton suggests that digital transformation is a necessary disruption in a given industry (Boulton, 2018). Meanwhile, according to other authors (Milev, 2018), not only business industries but also public organizations use digital transformation technologies. So succeeding with digital transformation, and succeeding in time would differentiate the organizations that disrupt their industries and gain competitive advantage from those that get disrupted and lose market share.

In a series of articles released each year, Daniel Newman tries to outline the most notable digital transformation trends. According to his latest article (Newman, 2018), we can expect some of the following digital transformation trends to be significant:

- The author of the referenced article suggests that the 5G technology would start to find its way into the supported services of mobile providers;
- Combined improvement in Natural language processing and Artificial intelligence would lead to many services being performed by computer programs instead of humans.
- Large investments and acquisitions in the cloud provider industry may lead to the interconnection of different public, private and hybrid cloud environments to form connected cloud environments that run seamlessly and are secure.
- Newman suggests that data analytics and machine learning will become more effective in analyzing more data and gaining more meaningful knowledge and insight from the giant amount of data that is being gathered.
- The augmented reality technology will continue to grow rapidly in influence opposed to the steadier growth of the use of virtual reality technology.
- The growing use of Internet of things technology and the need to process more data in real-time will emphasize the use of edge technology as opposed to cloud computing of the data.
- All the different separate variations of "as a service" options would make way for the more complete IT as a service – "ITaaS".
- Among the significant trends in digital transformation, Daniel Newman also includes GDPR related technologies as well as more efforts in adopting block-chain technologies for something other than cryptocurrency.

Although not specifically listed as a term, Big Data and the need for advanced analytics to process Big Data is still a "hot topic" that is also in the spotlight of technology (Stefanova & Kabakchieva, 2015). Reviewing the list of trending technologies that can help achieve digital transformation, it is very clear that the business processes of the organizations will most probably be the object of the change in order to implement those improvements.

Business process management overview

Everything we do, both as individuals and as part of an organization, is either a process or a process step. Scheel and Rosing (Rosing, Scheel, & Scheer, 2014) define a process as a group of interconnected activities or tasks that are carried out as a response to a specific event and aim to achieve a desired result for the process user. Adding the adjective "business" forms the term "business process" – a set of actions or steps in the organization that combine people, materials, machines, systems and methods and are done in such a way that would lead to the accomplishment of specific business goals (Rosing, Scheel, & Scheer, 2014). Basically, business processes are the way every organization carries out its tasks and accomplishes its goals. The need for better management of the organization in the last decade of the twentieth century led to the emergence of "business process management" or BPM. Swenson and von Rosing define BPM as a discipline that includes any combination of modelling, automation, execution, control, measurement and optimization of the interconnected activities that are done in the organization for the purpose of achieving the organization's objectives (Rosing, Scheel, & Scheer, 2014).

The development of BPM as a discipline is accompanied by the emergence and development of business process management software systems and technology. The author would like to emphasise that primarily and most importantly – BPM is a methodology. Business process management is a completely new way for the organization's management to look at the processes. It requires a big change in the mindset of the company managers so that their thinking becomes process oriented.

From a process point of view – Business process management is a cyclic approach for management of the processes that includes several phases in its lifecycle. The number and names of the phases vary in different interpretations of the BPM methodology but the author considers the following graphic representation of the BPM methodology to be very accurate:



Fig. 1. Business Process Life-Cycle (Altham, 2009)

Once an organization enters the "wheel of BPM", it will start to cycle through the BPM life-cycle phases and continually improve the business processes, bring new processes in the methodology and discard old ones. The organization will not stop in a few years deciding that the processes are perfect. There will always be something more to improve, and a step further to go. In this regard, BPM is not a destination, but rather a journey.

Evolution of Business process management software

Business process management software emerges in the last decade of the twentieth century to answer the dynamic changes in the environment of the organizations. BPM software is successor of the Workflow management systems (WfMS) but with one very important change. Workflow management software is centered on trying to make possible the execution of the tasks and workflow (process) in the system. On the other hand, the BPMS is centered on the way tasks and business processes are carried out in the system, the quality of the processes, the cost of each step. Each aspect of the running processes is measured, monitored and analyzed with the help of different key performance indicators, so that the organization can continually meet specific Service level agreements with its customers. A whole new layer of process analysis and process optimization is revealed.

Before an organization embraces the BPM methodology, there are all sorts of process-related problems that have negative effect on the speed and quality of the

business processes and subsequently on the results of the organization. Whether it is ambiguous and constantly changing processes, multiple different software systems to work on or lack of transparency in the processes, an organization can struggle with its processes without the help of BPM.

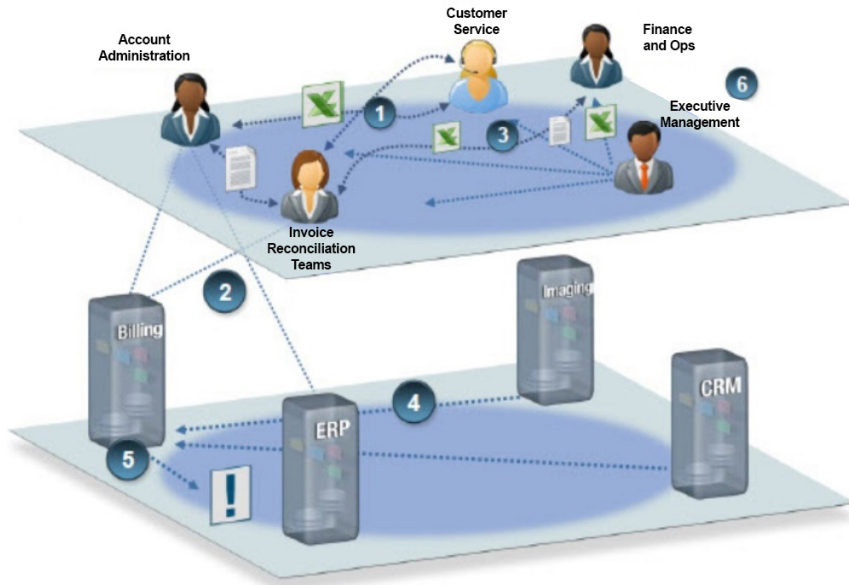


Fig. 2. Process-related organizational problems

Traditional business process management systems (BPMS)

The first BPM software products concerned mainly modelling and automating the business processes and eventually aiding the execution of the processes in the organization. At that stage a company already possess different software applications. The BPM system enables the organizations to model their processes, automate some process steps and execute the workflow of the processes. When a step cannot be automated, the process participant would receive information about the necessary actions to be performed in the corporate systems, documents, etc. The BPM systems were limited in terms of integration with other software systems and applications. This approach to the implementation of BPM systems and business processes can also be used today in organizations where system integration of the business processes with the corporate systems and applications is not possible.

Intelligent business process management suits (iBPMS)

The evolution of the technology leads to the development of the Intelligent business process management suits (iBPMS). The iBPMS typically include advanced capabilities like enterprise document management, business rules, case management, advanced integration features on a Service oriented architecture (SOA), cloud computing, as well as social collaboration features and responsive mobile user interface (Cheng, 2012). What is also very different from traditional BPM systems is the integration approach.

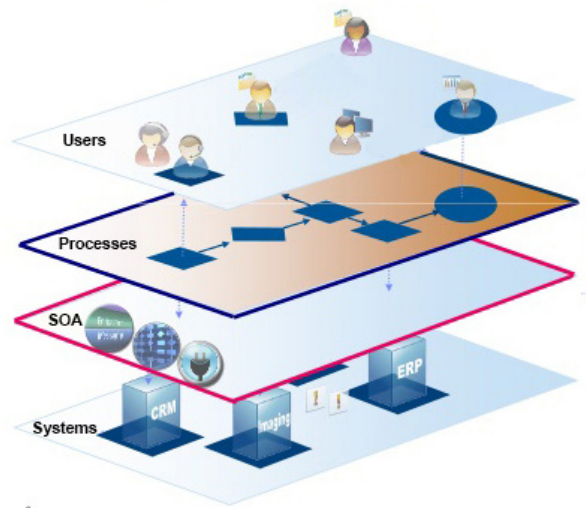


Fig. 3. Intelligent business process management suit integration layers (Buecker, 2014)

The iBPMS system forms a new application layer in the IT environment of the organization, taking away all process-related tasks from the existing systems and applications. Powered by the Service oriented architecture (SOA), the Intelligent business process management platform integrates seamlessly with existing applications and data to provide a single user interface for all process-related activities of the business user. Gartner defines the critical capabilities of the iBPMS platforms, based on six primary use cases (Dunie, Baker, Wong, & Kerremans, 2018):

- Composition of intelligent process-centric applications;
- Continuous process improvement;
- Business transformation
- Digitalized processes;
- Citizen developer application composition;
- Case management.

Even though the Intelligent business process management platforms address aspects of business transformation and digitalization, still the technological improvements and the drive for digital transformation pushes the evolution of BPM software further.

Digital process automation software

The latest step in the evolution of BPM systems leads to the definition of a new term and a new software category – digital process automation software. According to Forrester Research, digital process automation software is basically business process management systems with more advanced capabilities to address the need for digital transformation (Koplowitz, 2017). According to Koplowitz, this new software category emerges because the goals for BPM are changing to become aligned with the customers. The survey from Forrester Research shows that in 2014 BPM solutions were centered on cost reduction – first in the list of primary focuses with 30%, customer experience was third in the list with 21%, whereas digital transformation was fifth in the list with only 12%. Two years later customer experience was top of the list of priorities with 46%, digital transformation was second with 26% and cost saving third with 13%. The researchers' prediction is that digital transformation will top the list as the primary focus of BPM solutions in 2018 and cost savings will fall even further behind.

Another Forrester research analyzes key aspects of the emerging digital process automation systems and identifies the key features (Koplowitz, Mines, Vizgaitis, & Reese, 2017). According to the research, digital process automation (DPA) software expands traditional BPM systems, setting the focus on low-code development (or even no-code development in some cases), as well as very simplified user experience and innovations in artificial intelligence features. Another key aspect is the ability to empower business users to create more basic process applications with predefined components – a sort of self-service BPM. The cited research continues further to evaluate the key features for the top vendors on the BPM and respectively – DPA market (Koplowitz, Mines, Vizgaitis, & Reese, 2017). The current research will not include any results for the evaluation of the DPA vendors, but will only reveal a list of features that may be important for achieving digital transformation, based on the author's assessment. For clarification the author will include a short description of each feature:

- Collaborative modeling – the ability for the user to engage other remote users and construct process models or other elements in live collaboration;
- Smart forms and user experience – the inclusion of next generation web 2.0 enhanced user interface elements that are easy to customize and provide rich content;

- Business rules/modeling – the ability for the users to model decision services based on complex custom business rules;
- Robotic process automation – the ability to configure automatic tasks;
- Dynamic case management – the ability to handle complex unstructured processes that may take a different path at each execution;
- Low-code/no-code – the ability for the modelers to build processes without having to write program code (or at least – minimizing the coding requirements);
- Mobile engagement – the support of mobile application and push notification features;
- IoT support – the ability to integrate with Internet of Things (IoT) devices and data;
- Analytics – advanced reporting features for process data analysis;
- Artificial intelligence – capabilities for data analysis and prediction of process behavior;
- Digital workplace – providing a consumer-oriented process workplace.

After reviewing the list of key features for the emerging digital process automation software, most of them can be closely linked to the digital transformation trends – collaboration, enhanced user experience, automation, enhanced mobile experience, IoT, analytics, AI, digitalization. This is also determined by the main factors that led to the emergence of the digital process automation software category – the need for addressing digital transformation.

Conclusion

The evolution of existing technologies and the emergence of new technology will most probably continue to progress at an accelerating speed. Digital transformation may prove to be a crucial change that the organizations should undergo in order to be successful. The conducted research in the field of Business process management software gives the author the confidence to conclude that the growing need for digital transformation triggered the evolution of BPM software into what is called today – digital process automation software. Furthermore, the research shows that the DPA platforms will answer back and become a powerful source for achieving higher level of digital transformation. The completion of this article would give the author the opportunity for further research in the topics where Business process management technologies and digital transformation intersect.

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Abstract

This article aims to analyze the effect of the digital transformation of organizations on the evolution of business process management and the way BPM software is implemented. Research is made on the trends in business process management software over the past few years and the BPM implementation approaches to discover that as a result of the increasing technological shift of the organizations – business process management software has grown into what is now called – digital process automation software.

Key words: Business Process Management, BPM, Software, Digital transformation, Digital process automation.

JEL: C61, C88, O31