Humans, Processes and Robots: A Journey to Hyperautomation

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1 Abstract

Automating business processes is one of the most recurrent topics in industries, independent of its digital orientation. Competitiveness pushes companies to deliver their products or services efficiently and effectively. Besides providing the appropriate value, they are required to do it faster and with higher quality. This agile context leads to automate *everything* that can be automated to keep the focus on the value while optimizing the processing times, errors, and process performance, in general [9].

Human beings have historically suffered various industrial revolutions that transformed the way of working, producing, and thinking. Although resistance to change has always appeared, they ended up being adopted by companies and people to avoid inevitable obsolescence [11]. The irruption of Robotic Process Automation (RPA) in the area of business process automation seems to have laid the seeds for a new revolution of administrative digital work [3].

RPA is a software paradigm that enables software machines (also referred as robots) to interact with information systems through their user interfaces (UIs) in a process-oriented way. Freeing humans from repetitive and mundane work is its main mantra. It started receiving increasing interest in the last decade and has become the fastest-growing enterprise software market in the last years [2]. After an initial hype of unfulfilled promises, RPA keeps a significant traction [12]. Nonetheless, some companies still fail when trying to incorporate RPA in their projects.

This paper serves as a discussion on, first, how to frame RPA in the existing Business Process Management (BPM) paradigm (cf. Sect. 1.1). And second, it deals with its natural evolution to a wider automation technology across the entire organization: *Hyperautomation* (cf. Sect. 1.2).

1.1 Framing RPA in BPM

Nowadays, a plethora of tools is available in the application landscape under the umbrella of RPA. However, their application scopes are wide, ranging from

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simple UI scripting tools (e.g., UI.Vision[1] or RobotFramework[2]) to comprehensive systems that enable the development, deployment, and control of farms of robots (e.g., UiPath[3] or Robocorp[4]).

This situation creates uncertainty in companies when deciding what to use for their use cases that typically leads to failed projects [4]. On the one hand, when neither scaling nor a central government of robots is required, UI scripting tools could do the job at a fraction of the cost when compared to mature RPA solutions, which use to be disproportionate in simple contexts. On the other hand, the hype created around RPA pushes some companies to use the technology to the detriment of other more suitable solutions which would deliver more outstanding performance. For example, *utilizing* RPA to automate UIs even though the API is exploitable leads to unnecessary inefficiencies and high resource consumption.

Even when the project (i.e., undesired contexts where no other automation alternative would work) fulfills the suitability criteria for RPA, companies may miss a threat analysis of the solution. In case that RPA is applied as a long-term solution (e.g., in legacy systems that cannot be changed), it becomes highly dependant on the UI of the base system. Therefore, monitoring or continuous testing is required to anticipate errors [6]. In turn, if RPA is applied as a short-term solution (e.g., rapid solution without investing in a deep integration), its end-of-life should be defined and control. Otherwise, it will become a technical debt in the team that has to do the maintenance [8].

The future shape of the RPA technology is uncertain since mature RPA vendors provide some features that overlap with those traditionally existing in the BPM tools, e.g., process modeling, orchestration, and monitoring. Nonetheless, while the *RPA-centric* solutions focus on fine-grained tasks, *BPM-centric* solutions support rather more complex and sophisticated integrations. What is more, this uncertainty is increased by the different market movements in both (1) delivering more BPM features by RPA vendors or (2) acquiring RPA solutions by BPM vendors[5].

What is clear is that both paradigms are part of a new *big thing* that enables the automation of a broader range of processes end-to-end. Independently on how they integrate, industry-grade solutions for RPA may support robot developers and robot operators/maintainers in a DevOps continuous cycle. In the development field, besides just creating and executing robots, additional features are necessary, like supporting identifying candidate processes to robotize, controlling the version of the robots, evolving them, or managing test suits in controlled environments. Regarding the operation field, besides the deployment

[1] https://ui.vision.
[2] https://robotframework.org.
[3] https://www.uipath.com.
[4] https://www.robocorp.com.
[5] As an example, in 2020 Appian acquired Jidoka RPA solution https://appian.com/resources/newsroom/press-releases/2020/appian-acquires-robotic-process-automation-rpa-company.html.

of the robots in the execution environments, this role must be supported with, for example, scaling and descaling mechanisms, balancing the workload of the robot queues, or alerting rules to control the correct performance. These requirements become even more challenging when we consider the participation of the human in the process. This is highly relevant in the automation with RPA since the automated processes here are typically those which were previously on the human side. As the automation does not happen like a big bang but through iterations [7], methods are required which consider the human in the process and that the work gradually shifts from the human side to the automatic/robotic side. Although robots have an initial relevant role in this shifting, the eventual automation solutions may use other more sound and resilient automation technology.

1.2 The Era of Hyperautomation

Hyperautomation is more than just a fancy word. It has been coined to combine BPM, AI, RPA, and any other technology that may help conduct human duties in an automatic way within organizations. Not surprisingly, Gartner identifies this technology as the number one trend in 2020[6].

While RPA scope still requires standardization, hyperautomation gives a name to this continuous effort to try to automate *everything* that can be automated. Similar to BPM and RPA paradigms, hyperautomation requires methods to ease its adoption. Here, the separation of duties and decoupling of each combined technology needs to be guarantee to allow their individual evolution. In the same way, streamlining the incorporation and coordination of different technologies within the available automation toolset is a must. Beyond processes and tasks, this technology aims at the organization's scope and, thus, new or adapted measures or KPIs are required to assess the automation level of the organization after each hyperautomation iteration. As already demonstrated in many similar contexts, process mining stands as a suitable technology to automated this assessment as well as to accelerate the discovery of potential automation alternatives, existing inefficiencies, etc. [5].

This shake to the whole organization will need to be addressed from different perspectives besides the DevOps one. From a strategic point of view, organizations need to reorder their priorities, rethink the management of their risks and resources, and, in summary, envision a future company that will require more technology, innovation, and smart minds with far less mundane and repetitive work. From a technological point of view, organizations need to agile the technology acquisition and mastering, enabling fast knowledge sharing and collaboration from different units or departments from both business and IT levels. In the center of this organization transformation is the human who, on the one hand, will suffer automation initiatives at higher rates than before, which may generate adverse reactions if they neglect to estimate the human impact of the

[6] https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2020.

automation before its deployment [10]. On the other hand, human work habits will focus on more unique, cognitive, and valuable activities instead of batch-processing and simple ones.

One of the most determinant factors to successfully address all these dimensions of this journey to hyperautomation is to work on the skill developments at every tier of the company [1]. Continuous formations plans, knowledge transfer sessions, etc., are recommended in the area of automation. Current workers may benefit from existing literature and handbooks written for researchers and practitioners. In turn, a significant deficiency that needs to be faced is that the new generations—which typically came from universities and institutes—have access mainly to technical formation courses from vendors. However, both lectures and students lack comprehensive textbooks to get prepared for this new revolution called hyperautomation.

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