Hyperautomation to fulfil jobs rather than executing tasks: the BPM manager robot vs human case

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Abstract: Averse to being 'the year of the coronavirus', there have been quite some positive global technological and sociocultural advances in the middle of the present tempestuous period. This article takes advantage of the recent zenith that robotic process automation (RPA) is experiencing, with special emphasis on the associated hyperautomation form. It upholds on the latest state of software robots, technology, and business process management (BPM) knowledge, to insinuate the controversial case of having robots replacing humans for full time business process jobs. Up-to-date data is analysed as part of the methodology to understand the relevance of the research, including the application of Delphi techniques with a group or panel of international experts from Europe, Africa, America, Asia and Oceania. Prompted by the hypothesis that hyperautomation can be used to fulfil a manager role in a BPM organisation, the text elaborates on the technologies used to manage BPM, the role of a BPM manager robot and the demonstration. It determines, based on the final judgement of the panel majority, that it is possible to have an RPA robot fulfil a BPM manager role, and complements with constructive criticism and lessons on how to do BPM the right way.

Keywords: software robot, RPA, BPM, artificial intelligence, machine learning, industry 4.0.

1. Introduction

The last decade (2010 to 2020) has been witness to many new and/or raising terms linked to technology and innovation. There are each time more expert, yet exciting, knowledge areas to specialise on, with terms like big data, gamification, data science, blockchain, ransomware, artificial intelligence (AI), cloud computing, Internet of things (IoT), machine learning (ML), robotic process automation (RPA), quantum computing, computer vision, industry 4.0, among others, as well as business buzzwords like digital transformation, disruption, and agile.

Hyperautomation happens to be a recent technological term, which involves automation of knowledge work with a broad business scope and technologies integrated with a responsive workforce, mostly combining RPA with ML and/or further AI functionalities. Gartner, the well-known global research and advisory company, named 'hyperautomation' as the #1 in the top 10 strategic technology trends that will drive significant disruption and create opportunities over the next 5 to 10 years, with an expected year over year application integration's growth of 40% by 2022 (Cearley et al., 2019).

Although the word hyperautomation has been used in researches through the last two decades, it was only since a few years ago that a common context and meaning was gradually acknowledged. In late 2017, Wipro, a leading global information technology, consulting and business process services company, referred to hyperautomation projects at the time, as a cognitive service offering to their customers which combines RPA and AI for process automation (Tarafdar & Beath, 2018), going a bit beyond the classic execution of repetitive tasks.

It has been said that hyperautomation is among today's three main aspects 'forcing companies to rethink their management practices'. The other two are: a highly educated workforce, and perfectly informed customers. AI technologies enable autonomous actions for work situations where humans and robots collaborate, and RPA brings flexibility, decision-making intelligence and adaptability into business process environments with the use of AI (vom Brocke et al., 2018).

This last decade has also offered intelligent business process management suites/systems/

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software (iBPMS) to support Business Process Management (BPM) professionals on their disciplined approach to identify, design, execute, document, measure, monitor, and control both: automated and non-automated business processes (Benedict et al., 2019). As an iBPMS is one of the core professional components, managing long-running processes, and RPA has become a key technology to automate (Cearley et al., 2019), especially when connecting legacy systems, then the interest from BPM on hyperautomation is not surprising.

Although the term BPM has extensive roots, like Six Sigma, Business Process Reengineering and workflows, nowadays it means dissimilar things to different people (Harmon, 2018). Fact that is better explained throughout this paper.

This research is motivated by the hypothesis that '*Hyperautomation can be used to fulfil a manager role in a BPM organisation*'. With the general objective of verifying the above hypothesis, the following specific objectives have been established: (a) explore and review the current technologies employed to manage in BPM organisations; (b) analyse recent data and statistics to understand BPM trends and the relevance of this research; (c) develop the concept of a BPM manager robot and expose how it can really work.

2. BPM Status Quo

BPM can be referred to as a management area that produces an increased discipline in daily operations and alignment of resources, with a clear strategic direction, providing 'governance for a process-oriented organisation', using methods, policies and metrics to continuously improve and/or transform the performance level (Kirchmer, 2017).

Even though BPM emphasizes on the 'processes' of the organisation, it has a firm link to the business 'performance', and the 'P' on its acronym is sometimes confused or exchanged with the latter. It depends on the organisation, culture and/or its maturity. The organisation is being recognised as a 'system of interacting processes whose performance must be balanced' (Benedict et al., 2019, p. 20), and the BPM methods have an indirect contribution to process performance by establishing a process management culture (Schmiedel et al., 2019).

Strategy, governance and control are fundamental aspects for BPM success. It is advised to execute organisational efforts considering the company-wide strategy, maintaining and/or gaining the top management support. The BPM management should encourage the focus on planned and value-added activities, with no questionable business impact, to be successful. Governance, through the use of rules to manage processes in programs, projects, or initiatives, has been recognised as an important success driver, and also, by continuously addressing process improvements, it contributes to strategy execution. Controlling the quality of the operational process improvements with process ownership roles is considered necessary, not only to succeed, but to achieve enduring results too (Hernaus et al., 2016).

Day to day business as usual, as well as project work, are both based on processes with inputs and outputs, are modelled, and can have Process Performance Indicators (PPIs) defined and managed. BPM is being applied to any kind of business or industry (e.g. healthcare, banking, insurance, logistics and transportation, government) and function (e.g. Human Resources, Marketing and Sales, Finance, Operations, Information Technology, Legal). BPM is so present, that it is also possible to earn a Master or Doctorate degree in process work, since many universities have established BPM programs, under the business or IT area, while simultaneously AI, process mining and RPA tools have secured its stand (Harmon & Garcia, 2020). A good example is the new Polish MBA program with majors in Process Management and RPA, from the University of Business in Wrocław (WSH, 2020).

The BPM presence in companies, can be found in the form of a department, teams, or specialists, depending on the business size, knowledge, and maturity. In some organisations, such labour is only assigned as a side responsibility of an individual, and in certain cases, BPM can be non-existent, until they realise that it is not enough to have ad-hoc responsibility for BPM activities. Either centralised or decentralised (e.g. as part of various other departments), an institutionalisation

involves organisational commitment, with assignment of process management roles, formal authority, accountability and responsibilities (Schmiedel et al., 2019), which could as well vary depending on the BPM technological capabilities (e.g. ability to automate) influencing the change efforts and organisational configuration (Lohmann & zur Muehlen, 2019).

BPM relies on technology to manage processes and projects. While a modelling tool is a must have, an iBPMS might not be indispensable, as some companies develop their own in-house tools. Whether the alternatives provide: a similarly high level of productivity with low/no-code, dynamic changes, auto-generated documentation, simple integration with other applications (e.g. Enterprise Resource Planning - ERP, Customer Relationship Management - CRM), flexibility for process changes (e.g. by non-IT users), security administration, etc., is another story. Nevertheless, more and more BPM organisations and software providers try to embed advanced data analytics, RPA, and AI capabilities to strengthen their suite (Dunie et al., 2019).

In 2017, there was already reported businesses' interest to add some kind of RPA and AI capabilities to their process management suite (Harmon, 2018); technology potential that has led to what is now known as intelligent/cognitive automation, or even implementations now making use of 'hyperautomation', when duly leveraged in combination.

3. A Consulting Perspective - BPM Done Right

When it comes to the implementation of BPM initiatives or projects, it is usually recommendable to follow tried improving practices that encompass overarching strategies which take the entire corporate value chain into account. Here it is wise to draw from existing guidelines, such as the process classification framework (PCF) from APQC, a well-known United States organisation specialised in process and performance improvement, best practices and knowledge management. It provides over 1800 process indicators, complete with formulas, to continuously measure, benchmark and improve business processes (APQC, 2019). Since 1992, APQC has been creating a value chain abstract that stretches out into 13 main categories covering corporate aspects, from vision and management, all the way to the development of business capabilities.

This narrative of an all-encompassing nature of business process management is also paralleled by the ABPMP CBOK, establishing the operational end-to-end perspective of a business through BPM (Benedict et al., 2019 pp. 74-128). In other words, the intrinsic value that BPM as concept, combining technology and methodology, bring to the table is the possibility to not only visualise, applying standards like the Business Process Modelling and Notation 2.0 (BPMN), but to also actively manage and improve on existing business processes.

The BPM aspects themselves, are usually complex and multifaceted undertakings that combine a multitude of different technologies and disciplines. One of the most pivotal combinations for process management that can be pointed out, is BPM functioning in tandem with data analytics (Winkler, 2019). Harnessing process and business data in juxtaposition with furthering transactional datasets, data analytics enables the user to extend the basic BPM features towards climbing the data science ladder of engaging in descriptive, predictive, prescriptive and, lastly, cognitive data analysis. This conjunction has been so effective and commonly adopted that it has lent itself for coining the now standard industry term of iBPM or iBPMS, with the 'i' symbolising the data, business intelligence (BI) and analytics aspects of the BPM discipline.

While data science is a crucial BPM extension nowadays, it is just one of many others that make up the current landscape of modern and competitive process automation efforts. Additional crucial BPM linkages can be found with Enterprise Content Management (ECM), ERP's, Business Rules Engines (BRE), CRM's, standard corporate industry software and RPA's, as the complete customer journey normally transverses all these components, as well a large variety of different departments.

The vision of RPA is firmly rooted in the idea of increasing the effectiveness and efficiency of a given activity. As such, key parallels to the maxims of BPM as a concept can certainly be drawn. While an entire end-to-end representation of the value chain is at the heart of BPM, deriving its main return on investment (ROI) from the iterative and continuous improvement cycles, RPA, at the other hand, 'is said' to justify its existence mainly through the direct one-time replacement of functional human activities by technological means. In that relation, the value that is yielded by an RPA initiative usually stems from savings resulting from an initial implementation, replacing manual labour by technology, yet 'not necessarily' by increasingly optimizing response times or output volumes, as some initial studies suggest (Aguirre & Rodriguez, 2017). A multitude of robots can be grouped into a strategic RPA portfolio, leveraging existing automations through orchestration towards a strategic goal. Also, robots can be chained together, mimicking an integral business process. However, the largest potential for sustainable impact, from RPA, can be surfaced by the combination with other mission critical technologies. There is evidence of such a symbiosis for: RPA and BPM (Flechsig et al., 2019), RPA and ERP (Fernandez & Aman, 2018), RPA and AI (Gerbert et al., 2017).

In that sense, RPA does not seem to have gained its global acceptance and wide adoption as a potential 'tool for strategic BPM', but an effective technology to replace manual labour, especially in the back-office space, often being dubbed as 'clerical process automation'. RPA robots have proven 'businesswise' to be applicable for the task automation, execution layer, potentially more so in tandem with other automation technologies, as opposed to the replacement of management functions in general and BPM managerial roles in particular, at least at this point in time.

4. Methodology

Data from three contrasting sources is analysed to understand the market trends and potential relevance of this research. In the first exercise, the data comes from a 2020 BPM market survey from BPTrends, an online organisation that shares unbiased information about process improvement since 2003, gathering varied professionals from the field. The second input, is data from Google Trends, measuring worldwide interest or popularity of key terminologies. The third data source and the most laborious for this research, is the result of a global panel interaction with multiple video sessions held this year between June and July, applying Delphi social science techniques.

4.1. Pre-Analysis

According to The State of BPM Market 2020, 'the survey', which included business managers, consultants, practitioners and business analysts: 72% of the participants agree that process practices and technologies have helped to improve their organisation’s efficiency, versatility and customer satisfaction; it indicates that the impact of BPM is still recognised. At the same time, 48% have answered that less than 25% of the business processes in their organisations are modelled and documented; it denotes a high opportunity for discovery and improvement (Harmon & Garcia, 2020).

While the survey indicates that RPA has been among the top technologies that BPM professionals want to add to their toolkit (i.e. achieving the top 2 of 6 in the year 2017, and top 3 of 9 in 2019) in 2020, there were also short listed: BPM automation, process mining and decision management.

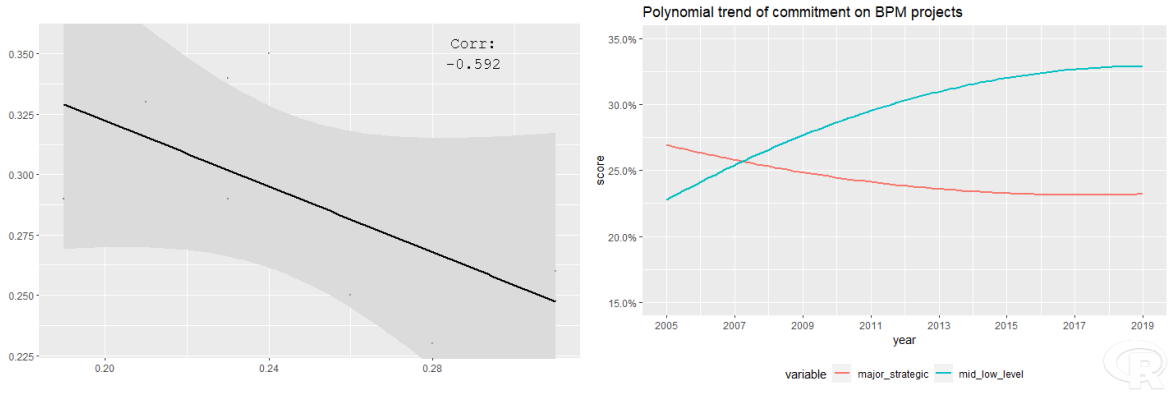

Figure 1. Correlation between BPM commitment on major strategic and mid/low level projects. Source: Own elaboration, with data from Harmon & Garcia, 2020.

An interesting, yet concerning, aspect is the declining number of participants in the survey, which started with 348 in the year 2005 and is composed of only 129 professionals in the recent edition. So, it became necessary to go a bit deeper, considering more figures, to interpret a possible reason.

The data from the survey, after analysing the development (see Fig. 1) through the years, demonstrates a negative correlation between the major strategic commitment by executive management and the commitment to mid or low-level projects. Although it could have multiple causes, the data suggests that as BPM decreases from being a hot management topic, it simultaneously reinforces its position on common projects in organisations.

Anyhow, there has been a loss of interest from the high management on BPM as we used to know it. The popularity of the buzzword or phrase 'digital transformation' has been replacing 'process' as the '*term for how organisations seek to reorganise the way they do business*' (Harmon & Garcia, 2020).

In contrast, when looking for the worldwide popularity of the 'Business Process Management' discipline over the last 12 months, from Google Trends, is evident the level of interest raised from March 2020 onward (see Fig. 2), with countries like Peru, Colombia, Ecuador, India and Nicaragua on top of the list.

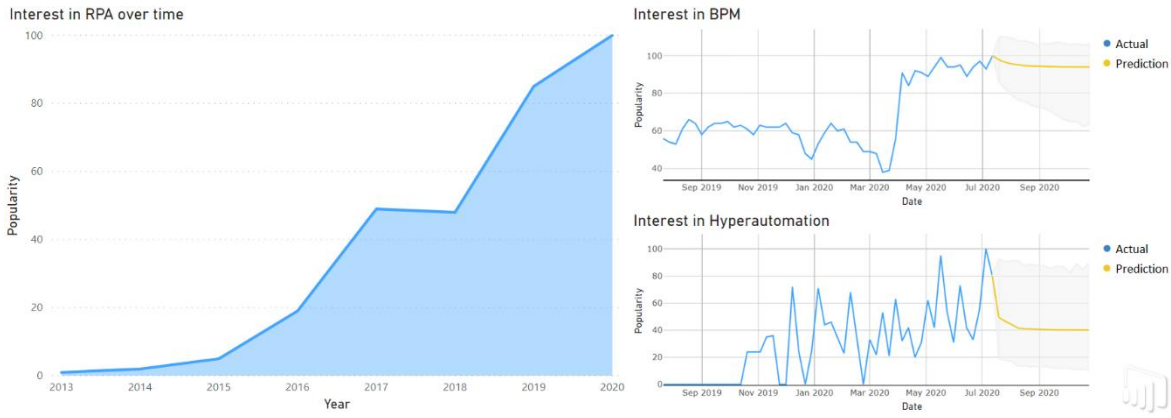

Figure 2. Worldwide popularity of RPA, BPM and hyperautomation. Source: Own elaboration, with data from Google Trends.

The persistent popularity growth of the 'Robotic Process Automation' term over the last 7 years is also striking in Fig. 2, and perhaps giving a little push lately to associated automation technologies worldwide. The same figure also shows the evolution of interest in the 'hyperautomation' term over the last 12 months, really taking off strongly from October 2019, with Germany, United States and India standing as top countries regarding popularity. An apparently sinuous growth of hyperautomation, as a term, respond to the fact that similar technological

practices are being called 'intelligent' and/or 'cognitive' automation, in a rapid development climate with different authors or sides trying to govern the concepts.

4.2. The International Panel

The panel counted with the presence of 33 experts from 26 countries. Being a professional and/or influencer, having knowledge and expertise in the areas of RPA, process management, and/or AI, were the pre-requisites. It consisted of 4 participants from countries in Africa: Nigeria, Tunisia, Morocco, Mauritius; 10 participants from Europe: Spain, Switzerland, Romania, Poland, Belgium, Greece, United Kingdom, Germany; 8 participants from America: Peru, Panama, Argentina, United States, Brazil, Canada; and 11 participants from Asia and Oceania: Philippines, Malaysia, Israel, India, Turkey, Australia, Vietnam, China. Most of the panel members can be seen in the Fig. 3.

Each member from the group was engaged in conference calls separately, knowing that other participants would go through the same process too.

Figure 3. Experts from the international panel, June-July 2020.
Source: Own elaboration.

They would not meet each other at the beginning, nor be aware of who else were participating. Their identity would not be 'initially' disclosed. Such approach was employed with the intention to obtain a unique product, of a better quality and different nature than the individual parts. Despite the fact that most participants work for renowned organisations, their professional opinions do not necessarily represent the stand of their employers or directed firms.

5. Concept Development

Since 2011, the three major challenges to gain acceptance of business process efforts at organisations have been: multiple changes competing for attention, low interest from senior management, and limitations to produce ROI estimates (Harmon & Garcia, 2020). The rise of RPA has been honoured due to its capability to overcome or circumvent similar obstacles.

5.1. Market and Technologies

Pegasystems, the #1 vendor of iBPMS according to the Gartner Magic Quadrant of 2019, recognized the synergies between RPA and iBPMS early on 2016, when acquiring OpenSpan. Similarly, Kofax acquired Kapow technologies earlier, IBM included offerings of task-level automation with RPA under original equipment manufacturer (OEM) agreement with Automation Anywhere and it is now acquiring WDG Automation; AgilePoint added connectors to provide integration with RPA and related services, ITESOFT secured an OEM partnership with Contextor for RPA, Appian recently acquired Jidoka RPA platform, and other vendors are developing own RPA components to complement core BPM capabilities of their suites. A resurgent interest from customers on business process automation technologies has been evident, with an exploding market of RPA tools promising fast ROI driven by user interface level integration (Dunie et al., 2019).

When comparing the RPA vendors in the Gartner Magic Quadrant of 2020, the leaders are different players, with UiPath, Automation Anywhere and Blue Prism on top, albeit Pegasystems is also present in a lower level as 'visionary' (Ray et al., 2020). The latter states that hyperautomation transforms business processes, delivering reliable, scalable outcomes, by creating '*a backbone of automation tools that work together*' (Pegasystems 2020). Hyperautomation is seen everywhere represented by RPA and the result of exploiting complimentary technologies integrated.

Industry 4.0, fourth industrial revolution or I4.0, as introduced by the German government in 2011, was set as part of a high-tech strategic economic development plan to increase productivity, efficiency, transparency and safety, with the integration of advanced technologies (Abdullah et al., 2020). The automatization envisioned at the time has reached levels of digitalisation and adoption that go cross-industry, promoting intelligent human-machine and machine-machine interaction as common practices within distributed systems, featuring autonomous interoperability, improved communication, monitoring and decision making. Such advancement is possible by combining data, virtual elements and multiple technologies to automate processes (Alcacer & Cruz-Machado, 2019).

Integrating multiple technologies with RPA has made it possible, for example, to demonstrate how RPA robots can be used as a support resource in teaching processes, applying natural language processing (NLP) techniques to teach lessons to a student of 11 years old, as well as exhibiting unconventional technologies that can work combined, such as the reading of electrical activity in the brain through electroencephalography (EEG) with brain-computer interfaces (BCI) or neuro-headsets (Lasso-Rodríguez & Gil-Herrera, 2019b).

The data is one, and probably the most important, enabler for automation. Varied technology with sensors (e.g. IoT), application programming interfaces (API), commercial or public apps, and in-house developed systems are predominantly used to generate input data for AI and processes which, by the same token, create additional challenges related to privacy, digital ethics and security (Cearley et al., 2019). RPA and related automation implementations have also been challenged and under stress test this year due to the unexpected global spread of the coronavirus disease (COVID-19) and the corresponding businesses' logistics. Notwithstanding the above, after 6 months of global recession and the new normal of remote working, it can be expected that RPA will benefit from further adoption, since more customers are prompted to consider RPA as a tactical automation option (Ray et al., 2020).

COVID-19 has also brought major strategic investments, like Microsoft's acquisition of Softomotive in May 2020, a Greek RPA technology firm based in the United Kingdom (Kathimerini, 2020), which had a solid position in the Gartner Magic Quadrant for RPA software in 2019, as a top niche player. Such move has allowed Microsoft RPA's front to improve: from being absent last year, to the position of top visionary enterprise vendor in 2020 (Ray et al., 2020). Microsoft is not only introducing significantly lower prices compared to other RPA vendors, but is also offering native functionalities like analytics with a strong set of AI and ML from its Azure cloud.

It has been strategically assumed for planning, that by the year 2022, 65% of the organisations which have deployed RPA, will have introduced AI, inclusive of algorithms for ML

and NLP. Nowadays, common use cases within business process automation are: anti-money-laundering efforts in banking, claims handling in insurance, and product data matching in retail. However, there are many more examples. A move from task-based to complemented RPA with an established toolbox, as an integrated system of intelligence, can accelerate hyperautomation (Ray et al., 2019). An exercise of tools selection should be performed prudently, since an iBPMS, for instance, may result overly complex for the need when: the organisation has very low BPM maturity, faces relatively slow rates of change, or is essentially focusing on document-centric process automation (Dunie et al., 2019). Choosing is not a simple task and there can be different opinions in the organisation, influenced by professional backgrounds.

5.2. The Voice of the Experts

After going through the first iteration of questions with each panellist, the answers would be analysed. Later, some preliminary results would be exchanged and another round with questions would take place. The iterative exercise would seek to obtain a consensus, if possible, or a final and stable result otherwise. There were no wrong answers and each opinion had to be respected, understanding the varied background and experiences on different working environments and cultures.

The points discussed were aimed at, first: verifying the suitability of the expert for participating in the panel; second: covering the main question of '*do you think it is possible to have an RPA robot fulfil a BPM manager role?*', followed by an explanation; and third: understanding which their preferred RPA vendors are. The Fig. 4 illustrates the answers to the main question after completing the first iteration.

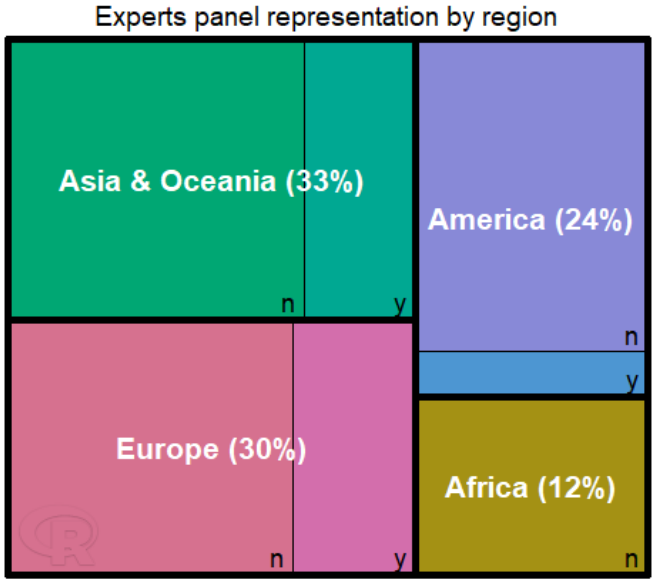

Figure 4. Percentage of panel participants by region.
Source: Own elaboration.

An acceptable 97% of the participants confirmed awareness about intelligent-, cognitive- and most importantly: hyperautomation.

At the beginning, it seemed, generalising, that those with apparent higher dedication on data science, artificial intelligence and research, believe that it is possible to have an RPA robot fulfil a BPM manager role, while those on a more corporate standing, with business process expertise, tend to believe that it is not possible and were commenting mostly about the commonly promoted RPA technology capabilities.

The expressed opinions about why it is not possible to have an RPA robot fulfil a BPM manager role, included the believe that RPA robots are unable to: do analytics and make decisions, but imitate human work; apply a high level of cognitive reasoning, only available (or not) in other applications; leverage artificial intelligence; apply soft skills like leadership, collaboration,

emotional intelligence, intuition, foresight and teamwork; listen to the sentiment of stakeholders; track the processes and think of where to optimize them; lead a workshop following a BPM project lifecycle on its own; monitor the work of humans and judge, but follow instructions. This group has the conjecture that the possibility is 'not there yet', but probably after some years. It asserts that in corporate environments there is lack of trust in technology for high levels of automation and the techniques involved.

In fact, much of the work above is possible to be done by a software robot, although it might not be necessary to delegate all to a single BPM manager, in the same way as normally not everything is done by a single employee. In terms of capabilities, impressive examples of advanced human-robot interaction (HRI) integrating RPA with other tools, were presented by Lasso-Rodríguez & Gil-Herrera (2019a, p. 7721) in the context of education, applying eye tracking and facial recognition. However those AI abilities go beyond the need of this BPM manager robot role.

Some of the panellists emphasised on 'the role' of the BPM manager, wondering what exactly such BPM manager would do, referring for example to central BPM offices, which can have multiple BPM managers with different responsibilities. Indeed, a BPM manager does not need to be a head of department.

5.3. Professional Environment and the Manager Robot Role

The BPM manager responsibilities, in scope of this research, make the robot shine in the monitoring and controlling of BPM projects. The role makes the robot responsible, for example, to track project steps compliance; contact process owners and/or relevant role/personnel on duty in the business area, depending on the communication need; remind and checklist for preparedness on scheduled activities to interested parties, recommending actions based on status; reach out by email, chat, or telephone; alert stakeholders on business incidents or unexpected process events; update project documentation; present scheduled and ad-hoc analyses about process quality and business performance; gather response, log and follow up on decision making for business process continuation; analyse and store sentiment of communication received; empathise with team members, considering perceived emotions and their demonstrated ability to perform.

BPM roles can be different from one organisation to another, even when titles are sometimes standardised (e.g. chief process officer, business process director, manager, consultant, architect, owner, leader, steward, analyst), but both, strategic and organisational commitments are complementary and intertwined concepts, where strategic planning or formulation, and strategy execution or implementation, are equally important. Formal process roles are imperative drivers of organisational success (Hernaus et al., 2016), thus specific responsibilities shall be defined.

Business process improvement is one of the specific factors that can lead to the creation of a project, for example, as result from a Lean Six Sigma value stream mapping exercise. It can be necessary to create, fix or improve products, services, or processes (PMI, 2017, p. 9). The Fig. 5 illustrates some of the generic inputs, outputs, and processes where the robot is involved, while being part of a formal project organisation, with responsibilities within the 'Monitoring and Controlling' project management process group, touching multiple knowledge areas.

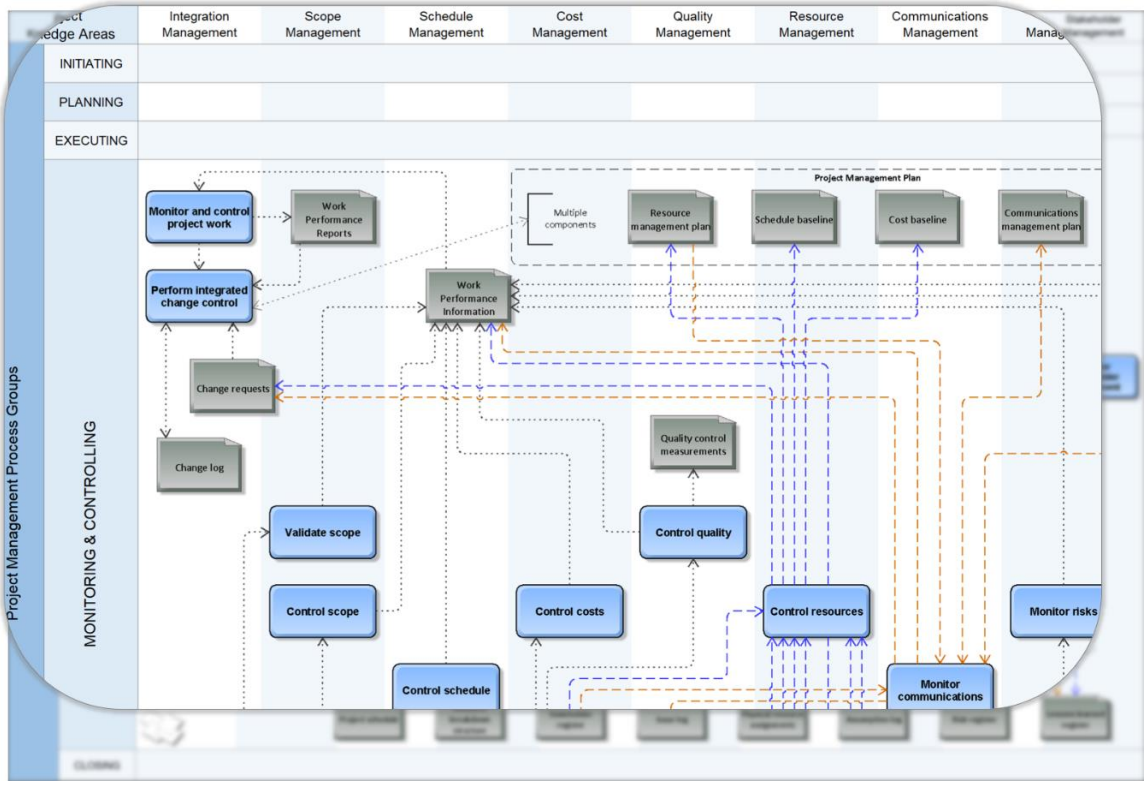

Figure 5. Some monitoring and controlling processes, inputs and outputs, where the robot collaborates. Source: Own elaboration, with data from PMI, 2017.

This job requires a highly qualified professional with discipline and knowhow. To fulfil the role, the manager needs to be transparent and honest when communicating, should excel ethically, without biases or discrimination on people, count with great time management skills, be committed and resilient on managing multiple projects simultaneously, and go the extra mile when the circumstances demand it. The candidate must be an expert collaborating with global cross-functional teams. Certainly, a robot taking care of this work is not performing a half role or hyperautomated microjourney, but a dedicated full-time equivalent job.

Such management and team collaboration are only possible with very structured work and standardised project management practices, though 'management' itself is sadly subject of discussion in work environments. Some argue that managers should be competent in their profession first, and then become candidates for managerial responsibilities. Technically competent and experienced managers lead with the confidence of doing things right, as opposed to bringing fear (Jimenez, 2019). A manager should be able to plan, communicate, pay attention to details, solve problems, negotiate, manage time, and if managing teams: people & conflicts (OGC, 2009).

According to the World Economic Forum (WEF), in its Global Competitiveness Report 2019, the development of skills does not match the needs of the economy; it has been suboptimal for the current and future workforce. At the same time, talent has not been allocated to its best use due to the inequality of opportunities, with barriers like discrimination, credit constraints, political connections, geographical differences, and corruption. Those obstacles must be worked on, as Industry 4.0 increases the demand for highly educated and qualified candidates (Abdullah et al., 2020), and relies on the human capital as the driving force of economic growth, in conjunction with agility, resilience and innovation (Schwab, 2019).

The managers who are not well educated and experienced in the field where they perform, avoid making decisions and refuse taking responsibility for them. They prefer to delegate and control, or to create committees as an approach to dilute accountability (Jimenez, 2019). Unfortunately, technology is an enabler and it does not fix bad models or broken processes automatically. Hence, one of the reasons why a robot manager could have serious challenges in terms of intelligence in an office and managerial environment, is because the higher the role goes

in the organisational chart, the less structured and more political it typically becomes. It is suggested that chief process officers consider their corporate BPM technology capability to evaluate the education and possible reskilling needs of personnel in charge of process management, as well as the skills configuration in the organisation (Lohmann & zur Muehlen, 2019).

Figure 6. BPM manager robot contacting a project stakeholder by phone.
Source: Own elaboration.

Training the robot is an arduous labour. Fig. 6 shows a screenshot of a video recorded during HRI tests. The robot was provoked by failing a scheduled process event. He had the duty to contact a specific stakeholder by phone to address the situation on such circumstance, following the communications management plan. A recording having a comparable functionality to the one of Fig. 6 was presented by Lasso-Rodríguez & Gil-Herrera, with an RPA robot participating in video-conferences via Skype (2020).

The process should be efficient before automating it. Automating something inefficient accelerates the creation of waste and flaws. Even worst when there are intentions to create AI with ML. Typical manager duties like: knowing your team members and pre-empting when they are likely to fail (e.g. classification algorithms), considering absences and time off from previous years to foresee resource shortages (e.g. time series algorithms), perceiving their mood to regulate the exchange (e.g. NLP algorithms), or more specific undertakings like: splitting the work as part of the measures to control quality (e.g. clustering algorithms) and influencing the behaviour of colleagues by understanding the relation between their actions (e.g. association algorithms); all are jeopardised when data and/or process issues exist. Interestingly, some of these activities are not commonly performed by some human managers.

The general differences between a robot and human are not something new. These have been mentioned, for instance, by Lasso-Rodríguez & Gil-Herrera when listing important attributes of RPA robots to teach (2019b). In the case of the BPM manager robot as an employee, some of his wonders include: invulnerability to COVID-19 and other diseases, tirelessness of doing the same work, safeguarded to resentments if colleagues lose their mind, sheltered against burnouts and stress symptoms which usually call for time off.

Satisfyingly for some, during the last 12 months, automation has become each time easier to implement, with vendors making ML features available to use in RPA tools with a mouse click. Though it might not be as simple as it sounds, at least not for HRI, for instance, with the challenges that come when trying to maximise team performance (Rosenthal-von der Pütten & Abrams, 2020).

The conception of AI is constantly renewed. It is closely linked to people's understanding and perception of the current technological possibilities to imitate human intelligence. These are influenced at the same time by the direct access to new technology, as well as information, which usually comes by proactive learning, or social media, including Internet, TV advertisements, news and sensationalist transmissions. The last one has the power to educate, or misinform, the masses.

As the scientific knowledge progresses, the people, including researchers, tend to try to typecast different computing techniques as not AI anymore, forgetting that the essence is not about isolated successful tests alone, but the harmonised application of technology, or solutions, for the evolution of the society. However, it is conceivable that in some circumstances, there is dependency on wealth and investments to experiment.

Proactive efforts are needed to support a healthy and productive global development. The world is not on track with the United Nation's Sustainable Development Goals, for instance, with the goal #8: 'Decent Work and Economic Growth', as some countries have missed the target since 2015. It is only a decade left until the deadline of 2030; WEF suggests finding a balance between technology integration and human capital investments, and states that '*the global economy is ill-prepared for a downturn after a lost decade for productivity-enhancing measures*' (Schwab, 2019).

6. Results

The new information provided as outcome of the first round, allowed the experts to reflect on the main formulated question. Giving each participant the opportunity to have a glance at the opinion of other experts, considering more perspectives, made it simpler to decide on whether to stay or change their position from the previous iteration.

During the final round, it was still not possible to reach a consensus. In comparison to the first iteration, where there were basically 'y' and 'n' as answers, the last iteration shows a result code 'NA', meaning not available, for those that for some reason were not able to comment.

Nevertheless, having shared details and intermediary results, allowed the following statement to be proposed:

'It is possible to have an RPA robot fulfil a BPM Manager role, as long as it is not the head of department, since leadership, emotional intelligence and innovative mindset are not robot strengths'

An acceptance or agreement to this statement is represented with a result code 'y-' in the Fig. 7, where the first and final iteration can be conveniently compared.

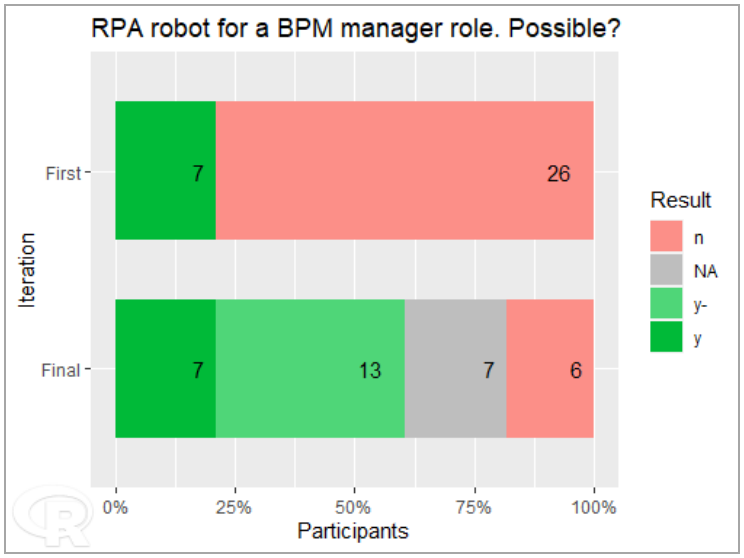

Figure 7. Answers from panellists on the main question.
Source: Own elaboration.

While in the first iteration only 21% seemed to agree positively; as result of the last iteration 61% of the panel members essentially agreed that it is possible to have an RPA robot fulfil a BPM manager role.

Interestingly, a few times it was evident that the image or reputation of the participating individual played a decisive role, adding comments, for example, about the position occupied in the organisation they represent and the intent. In such case, the professional would refrain from making comments that could be seen as promotion to replace humans with robots.

The panellists were also asked whether they had a preferred RPA vendor that could better suit or approximate the purpose of creating a BPM manager robot. The top 3 choices together accounted for 82% of the votes, namely UiPath, Automation Anywhere and Blue Prism. Three participants did not have a preferred RPA vendor for this endeavour.

Similarly, after asking them for the first 3 vendor names that come to their mind when they hear RPA, despite having a tighter competition, the top 3 finalists were also: UiPath, Automation Anywhere and Blue Prism. There were 2 distinguished candidates, due to their open source offer: Automagica and Open RPA. Applicable here, as in many other contexts: the game changer is not always the tool, but how it is used. Comparably, there is the option to do ML in-house (e.g. with Python) or spend on a third-party service (e.g. Cloud) to obtain a similar output easier.

7. Conclusions

Hyperautomation is revealing the true capability of software robots when combined with multiple tools and techniques. It shall not be surprising to hear soon about brave businesses trusting more on self-reliant robots with AI to take over expert professional work and higher responsibilities.

Through this paper, it has been possible to touch diverse technologies used to manage in BPM organisations, with pre-eminence on iBPMS and its data, BI & analytics aspects. There were three main sources of recent data consumed to understand BPM and associated technology trends, subsequently confirming the relevance of researching about the capability of RPA robots in BPM organisations. The concept of a BPM manager robot was developed and exposed, demonstrating how it works, with defined tasks and responsibilities, and finally having an international panel majority agreeing on the possibility to have an RPA robot fulfil a BPM manager role. Hyperautomation has triumphed.

Implementing a robot with similar AI capabilities is not a simple task. Hyperautomation requires expertise in multiple knowledge areas and it can easily result costly, not only to build, but also to maintain. Even though it can be possible to have a software robot fulfil certain management roles, that does not mean it will be a good practice for every case. Therefore, is it recommendable to define specific and measurable outcomes, validating the feasibility (e.g. stability of processes, economy of scale) to deliver the expected business value. Considering an iBPMS as governing actor into the picture, may not be a bad idea for the long term.

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