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The Road to Intelligent Automation in the Energy Sector

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Abstract. *With Robotic Process Automation (RPA) nearly at its peak in terms of awareness and capabilities, organizations are exploring what's beyond it. The road to Intelligent Automation must include a cognitive roadmap that each vendor solution should consider it before developing. While RPA can cover between 10% and 40% of the processes of a business unit in each organization, intelligent automation can go much further – close to 100%. These solutions have learning capabilities attached to it and analyze decisions and act just like humans. Systems enhanced with these technologies can decide how to allocate the effort in an organization, it can stop performing some activities in order to allow performing other much more important. And while these may not seem something transformational, just knowing that a Power & Utilities (P&U) company works with this kind of robots to face the extraordinary energy requests especially during the peaks is a great thing. In this article, we will explore the new field of Intelligent Automation (IA) with a suggestive Case Study in P&U.*

Keywords*: intelligent automation; Robotic Process Automation; RPA; cognitive roadmap.*

Introduction

In one his latest public interviews Andrew Ng (2017), an Artificial Intelligence (AI) pioneer, considers that the impact of AI will transform all the industries alike and its impact can be more similar to the emergence of electricity. According to Everest Group (2016) the AI market is expected to cut employment costs by 9 USD trillion by 2020, while HfS Research (2017) estimates that AI automation market will surpass the Robotic Process Automation (RPA) market in 2021 with an estimated value of 2.7 USD billion vs. 1.2 USD billion. An Accenture (2017) report predicts that AI has a potential to boost profit rates by an average of 35% by 2035. The trends are going in that direction and because forced by governments around the world to raise the minim wages organizations picked automation as a solution of maintaining costs. Forrester Research (2017), one of the leading research institutes, estimates that by 2021 the global market for business process automation will have more than 4 million robots doing both front-office and back-office tasks. The topic remains a sensible one for governments which have only two options, which are: (1) continuing deregulation and (2) adapting the educational system to the new employment market needs.

The anticipated compound annual growth rate (CAGR) after implementing RPA is expected to reach 57% by 2022, according to a Market and Markets (2017) report. Probably, CAGR will be likely hired for after implementing Intelligent Automation. That is why this paper aims to deliver a clear understating of what is Intelligent Automation (IA), what are the different types of technologies behind, on what systems are running, what are the benefits for joining the movement, how long does it take it to implement, what are the best business areas for automation and how one implements Intelligent Automation in an organization.

There are three different types of the technologies:
1. Class I (Basic process automation) – which consist of applications, add-ons, macros etc. that sit in the presentation layer and are not integrated with an IT application (e.g. SAP). This category can make up to 10% savings costs.
2. Class II (Enhanced/intelligent process automation) – which consists of technologies that use natural language processing and can understand unstructured data and apply that understanding to process automation. Here the most important platform is the Robotic Process Automation (e.g. you can design a robot to provide you the amount that should be paid to a specific vendor, but you cannot do that to each vendor unless you have developed a flow to deal with the request). The savings for this one are estimated between 30% and 50% depending on the selected business area.
3. Class III (Cognitive platforms) – is comprised of systems that attempt to solve problems just like humans. Equipped with machine learning and other cognitive solutions the platforms can learn from the mistakes they make or just from observing how independent users act and take decisions (e.g. if the solutions observe a user that schedules for payment 99% of the vendors on Thursday and 1% of them on Monday it will remember it and will apply the same criteria moving further). The estimated saving costs are more than 60%. The current paper is focusing on this type of solution.

All these new processes will make obsolete many jobs and will create new jobs with new knowledge and skills requirements. They put a lot of pressure not only the management and organizational culture of the actual companies (Ghinea & Bratianu, 2010) but also on universities to switch from classical knowledge transfer to developing conceptual skills (Bratianu & Vasilache, 2010; Bratianu & Vătămănescu, 2017).

Intelligent Automation (IA)

The implementation of IA will result for organization in multiple benefits, such as: decreased operation costs (i.e. more than 60%), data analytics capabilities (i.e. you will know exactly how much times requires for a bot to perform a task and you can use it for multiple tasks 24/7), improved regulatory compliance (*i.e. bots can be thought to leave audit trails and alert a person when problems arise*), increased efficiency utilizing User Interface or the presentation layer of the IT infrastructure, increased employee productivity (e.g. a bot can create a report and a human can interpret the report based on all the extra information not available to the bot),

reduced error rate and delivery risk, increased customer satisfaction (e.*g.* unlocking a PIN card a bank card without a human help and 24/7 for sure that bank will be perceived at least partially digitalized) and other logistical advantages.

A question raises mostly all the time when professionals are discussing IA: "How hard is to train, deploy and manage robots?". Just as Blueprism described *"a robot is trained through a workflow of the procedure. This workflow is managed and audited to document the procedure. Management information is gathered automatically as the robot operates. All processes generate statistical profiles as a by-product of doing the action. This allows tuning and development of a process in light of real data."* (Aspara, 2018, p.1). Unlike the human beings training the robots is based exclusively on rational thinking and rational decision-making, without any intervention of emotional and spiritual knowledge (Bratianu & Orzea, 2014; Bratianu & Vătămănescu, 2018).

Modern robots can detect an anomaly in the system, but because they have a "memory" it can overpass the error by applying past patterns. Usually, it takes several weeks (4 to 6) for a robot to learn what a human is doing, but depending on the complexity level of the learning process one can take longer. The typical business areas where IA is recommended are the following: Information Technology, Human Resources, Finance, Tax and Controlling, Supply Chain. From the current case study, we found out that delivering IA can cost as little as 30% off versus a Full-Time Employee (FTE).
Below is a list of areas based on authors' practical experience where IA can gain ground at a fast pace:
- Analyzing unstructured data and applying repeatable commands.
- Accessing multiple systems independently in order to find an information (e.g. "How much I owe to vendor Alpha in payments?" or "How much I have paid to vendor Alpha from the beginning of the year*".*
- Achieve information searches.

Machine Learning (ML) has a subfield called Deep Learning which is leading the way in the Artificial Intelligent (AI) business applications. Capital IQ (McKinsey & Co, 2017) provided an analysis of the external investments in AI-focused companies by technology category in 2016: Machine Learning (56%), Machine Perception (28%), Autonomous objects (8%), Natural Language (7%) and Virtual Agents (1%). Worth to mention that the most spectacular recent discoveries in AI have been achieved in ML and Deep Learning. Last year (TechCrunch, 2017) the Deep Learning Machine Deep Mind (owned by Alphabet Inc.) won 4-1 against the world champion to GO. The main reason Deep Mind won was that Machine Learning directly benefited from increased data availability and computing power. Machine Learning tasks are typically spread over three large areas of action: (i) Supervised learning - Machine Learning directly benefits from increased data availability and computing power (e.g. deciding whether an email is a spam or not), (ii) Reinforcement learning - Machine Learning directly benefits from increased data availability and computing power and (iii) Unsupervised learning - Machine Learning directly benefits from increased data availability and computing power (e.g. client segmentation). Based on

the authors' experience the *"Golden journey"* to digitalization can be summarized as in *Figure 1*.

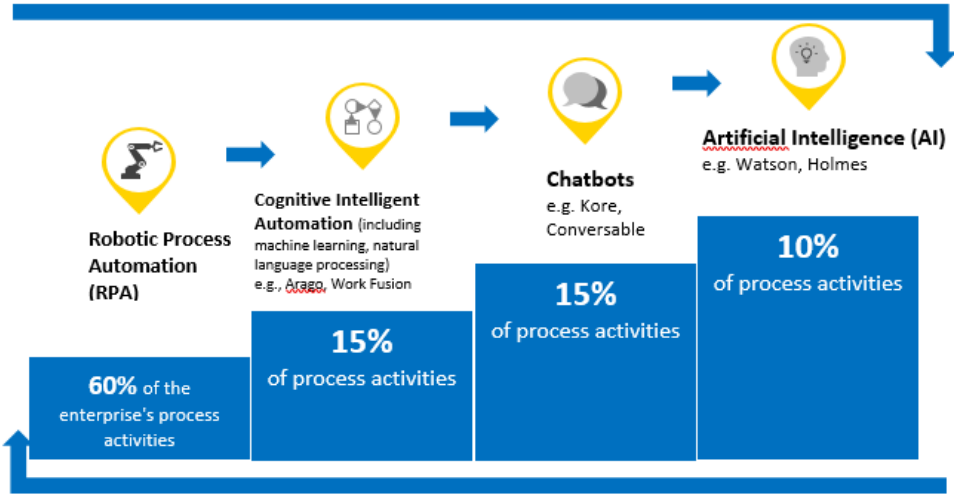

Figure 1. The Intelligent Automation evolution map

Power & Utilities industry overview

The Power & Utilities (P&U) sector faces tremendous challenges to their business model which will suffer great transformations in the following years, which can be summarized in three main areas:

1. A great energy disruption – mainly due to Data revolution and Digitalization & Technology of societies around the world. Behind Data revolution lays enormous amounts of available data and multiple sources of data a company can use, while under Digitalization & Technology the most important aspect relates to digitalization along the P&U value chain and exponentially improving new technologies efficiency.
2. A cleaner energy mix – under the European Union scrutiny, the mix of energy each European country is producing will transform itself: from grey energy (e.g. coal) to green energy (e.g. wind, hydro and solar). The last piece in this puzzle is the arrival of mass-market electric vehicles. The electric vehicles started to gain ground on the market based on the state subsidies and the inclination of people to use cars friendly to the environment. The big change here lays in the way the energy is stored and its attached cost (e.g. renewable power sources are less reliable).
3. A complex business model – becomes now a new model for low-carbon energy generation, which implies also the development of new products and services. Under the pressure to develop these kinds of products and services the regulations in the sector will decrease gradually, thus increasing competition. From the price point of view, the market will be characterized as highly volatile.

With Artificial Intelligence companies in P&U can take an advance in four areas: Power generation, System distribution, and Smart grids, Supply and Demand, Customer Services.

Under power generation, a new set of models emerged supporting the growth of new entry usages *(*e.g. storage, electric vehicles etc*.).* This will help in maximizing power generation with real-time adjustments. When it comes to System distributions and Smart grids organizations started to create new power ecosystems based on new ways to produce and consume power (e.g. microgrid), while tackling uncertainty and unpredictability grids (consummation peaks, fault detection). Both *Power Generation* and *System Distributions* reduce operating costs in two ways: Enable predictive maintenance with smart operations management (maintenance, security, monitoring) and minimizes downtime with data management on the grid (supervision, monitoring, and autonomous piloting).

Gartner (2018) assessed the IA industry as of 2014 with implications until 2024, as seen in Figure 2 below:

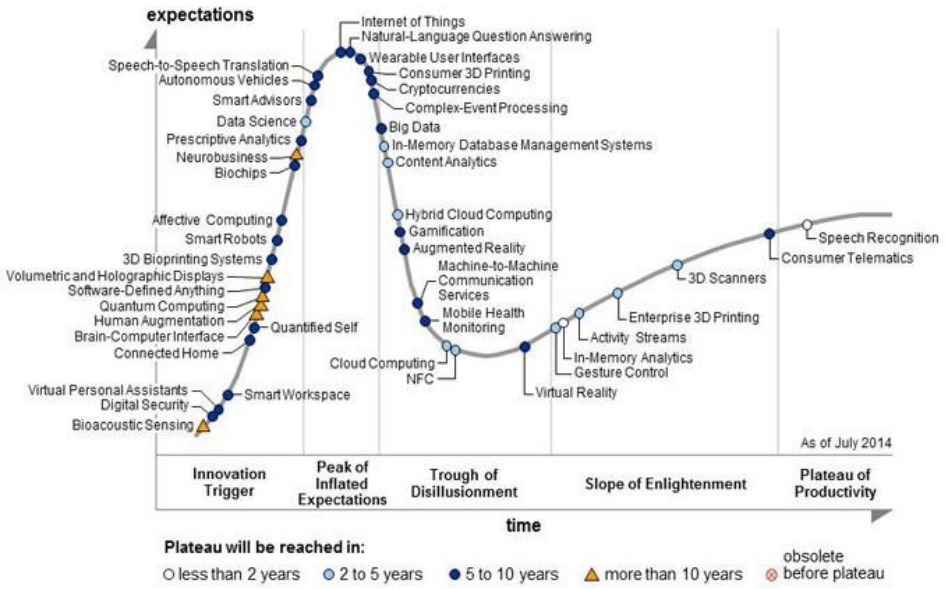

Figure 2. Assessment of the digital solutions (Gartner, 2018)

At the moment most companies are still piloting Intelligent Automation solutions. Activity tends to be within a single department, with limited enterprise governance and use cases. Unlike other solutions, AI is multi-faceted, multi-purpose, and combines with other technologies like RPA in order to create a nearly infinite number of use cases and applications in every context. Artificial Intelligence has triggered the emergence of new design paradigms, including anticipatory or predictive design, ambient or connected design, augmented and virtual design, and generative design. Since the field itself is hyper-emergent, few companies will ever feel like they are ahead of their peers, so capability building will be a constant effort. It also requires an iterative approach, supporting multiple cycles. The intellectual capital of any company will change its content and evaluation perspective (Bratianu, 2018).

The opportunities for Intelligent Automation span across the entire organization. When it comes to the front office it can offer superior customer and employee experiences, can generate new revenue via new products or services and it gain a competitive advantage via expert judgment replication and augmentation. The Middle office – design hyper-efficient supply chains, transform costs and operating models and offer a new enhanced view.

Lastly, in the Back-office – it can improve the efficiency and quality of judgment-based processes, more engaged and productive workforce, Enhanced control, compliance and risk management. In Table 1 the solutions to front-office operations using Intelligent Automation are provided:

Table 1. Solutions to Front-office operation using Intelligent Automation

Value	Solution	Convergence
Transformed cost and operating models	Enterprise-wide implementation of intelligent automation across every business function leveraging RPA and AI tools and methods	Robotic Process Automation (RPA) and Artificial Intelligence (AI)
Enhanced and new insight	Intelligent process optimization solution enabling precise on-line forecasting of atmospheric distillates' quality parameters leveraging IoT devices and machine learning.	Internet of Things + Analytics + AI
Improved efficiency and quality of judgment-based processes	Combination of rules and cognitive automation leveraging machine learning to classify & review Disney products test reports.	RPA + AI
More engaged and productive workforce	Automated IT service desk issue assignment to appropriate IT team via a chatbot along with RPA bots for resolution	RPA + AI

Core functional areas of Supply Chain, Finance and Human Resources are the prime candidates for driving process efficiency by utilizing IA. Functions such as Sales, Marketing and Commercial typically have a significant number of processes that are manual, repetitive, involving moving data from one source to another, consolidating and producing reports.

The Table 2 below highlights the automation opportunities typically seen across the functions. The actual will depend upon how this process is implemented in the

company, the level of existing automation and number of Full Time Employees (FTE) used.

Table 2. Intelligent Automation potential by functional areas
Source: author's own research and practice

Functional area	Potential IA opportunity	Automation potential	Savings potential
Supply chain	1. Supply chain planning 2. Transport planning 3. Supply planning 4. Project management 5. General supply chain services	10-15% 10-15% 10-15% 10-15% 10-15%	10% - 15%
Order to cash	1. Customer master data management 2. Credit management 3. Customer service support 4. Account receivables management 5. Incoming payments 6. Deductions and disputes management	25-30% 25-30% 25-30% 25-30% 0-5% 25-30%	40% - 60%
Human resources	1. HR general services 2. Expat management	25-30% 10-15%	60% - 80%
Source to pay	1. Source-to-purchase 2. Purchase-to-pay 3. Projects support	25-30% 25-30% 10-15%	50% - 70%
Finance	1. Intercompany 2. Account and bank reconciliations 3. Financial planning & analysis 4. Tax	25-30% 15-20% 25-50% 40-60%	30% - 50%
General accounting	1. Fixed assets / FMM / closing & reporting 2. Local Tax Accounting	25-30% 10-15%	10% - 15%
Controlling	1. Product Costing 2. CO operation/reporting 3. Business controlling support 4. BI & systems 5. Group financial controlling	5-10% 10-15% 5-10% 10-15% 5-10%	15% - 20%

According to McKinsey & Co (2017) analysis, the most developed part of Artificial Intelligence is Machine Learning (ML) with its subfield called Deep Learning. External investments in AI-focused companies by category in 2016 are split between Machine Learning (56%), Machine Perception (28%), Autonomous objects (8%), Natural Language (7%) and Virtual Agents (1%).

ML benefits directly from increased data availability and computing power, this is how Deep Mind (TechCrunch, 2017), one of Google's companies, succeeded to defeat the world champion to GO. By watching thousands of games and learning patterns

and possibilities it succeeds to outperform the GO world champion by four to one in a five games tournament.

ML tasks are typically classified in three broad categories: (i) Supervising learning – where it builds predictive models thanks to past observations, (ii) Reinforcement learning – by determining the behavior to achieve a goal, through interactions with the environment and (iii) Unsupervised learning - by building a model that cluster unstructured data.

Power & Utilities (P&U) is a market characterized by high regulations with very low access of entering. That is why the sector faces a number of threats and challenges to its existing model. From this point of view, AI offers tools to help adapt. There are three trends happening simultaneously and which P&U need to address them:
1. A great energy disruption – there is data revolution ongoing, both a massive increase of data and multiple sources of data (e.g. from each electronic object in the household). P&U will continue to get digitalized over along the value chain, while exponentially improving new technologies efficiency.
2. A cleaner energy mix – because a switch from grey (e.g. coal) to green energy is happening. One can easily remark the explosion of wind and solar farms along with the starting of mass production of electric vehicles (EV). Just this two disruption will lead to other likes creating new industries and new possibilities because a new type of storage is required. Classical sources of energy will decrease but will not fully disappear. With the usage of green energy organizations and governments alike will face new challenges because the renewable power source is less predictable and how to maintain a secure and reliable supply to customers.
3. A complex business model – is characterized by the appearance of new business models to low-carbon energy generation and the development of new products and services. The entire P&U ecosystem will be open to competition due to deregulations. Also, the costs will suffer from high-volatility as continuous assessment of supply and demand based on price signals will continue.

In this context, P&U can take advantage of AI in each section of the value chain: Power generation, Distribution systems, and Smart grids, Supply and Demand balancing, Customer services. Under the Power Generation P&U organizations will continue to enable new generation models supporting the growth of new energy usages (e.g. storage, EVs etc.). Real-time adjustments will be made in order to maximize power generation efficiency. As a result, the distribution systems and smart grids will evolve too. Organizations will create new power ecosystems based on new ways to produce and consume (e.g. Microgrid). Also, organizations will tackle uncertainty and unpredictability grids (e.g. consumption peaks, fault detection etc.).

As a result, for these two categories (i.e. Power generation, and Distribution systems and Smart grids) the operation costs will be reduced, mainly through enabling predictive maintenance with smart operations management (maintenance, security, monitoring, etc.) and minimizing downtime with data management on the grid (supervision, monitoring, autonomous piloting). Balancing supply and demand it's always a challenge, but good practice, results will show off. Organizations can improve the supply and demand by creating new energy trading capabilities (e.g.

modeling and forecasting of electricity prices), by self-learning through prediction models, by performing short-term and long-term forecasting of spot prices based on various factors or by providing an autonomous response to market signals through continuous assessment. When it comes to the customers the marketing and energy services will transform alike. Through marketing, organizations can commercialize new tailored services that suit customer's preferences (e.g. best pricing, energy supply, virtual agents etc.) and can improve customer retention due to a better understanding of his behavior.

In terms of energy services, organizations should provide new energy solutions to optimize business consumption and should pilot energy consumption with autonomous smart systems. Artificial Intelligence is considered a solution in one of the cases described in *Table 3* below:

Table 3. Intelligent Automation potential in the Power & Utilities sector

	Mature	**Emerge**	**Potential**
Power generation	Uncertainty modeling to improve power system reliability management	Predictive generation model using Deep Learning	Autonomous platform to regulate energy generation in a power plant
Distribution systems and Smart Grids	Detect the origin of power cut using data from smart meters	Image analysis to detect faults in infrastructure	Predictive maintenance on installations
Supply and demand balancing	Forecasting accuracy of power injections and power offtake	Modeling of electricity prices	Smart Buildings
Customer services	B2C clustering and customer segmentation. Detect fraudulent transactions	Customer chatbots. Intelligence piloting and home automation	Fully automatic processing of client claims

Organizations can nowadays deal with high fluctuations and limited predictability in wind power electricity production causing economic and operational challenges using Artificial Intelligence to forecast the consumption needs. As a result, the supply is stabilized and efficiency is overall increased.

AI has the capability to correlate past weather and, for example in wind generation energy, turbine operation data to predict the consumption of a specific period of time. Just by doing the aforementioned actions the wind turbine repair and maintenance process can be done when the consumption is low which might result in a 7% increase in productivity. The difference in this case of using AI for predicting the energy consumption instead of using advanced statistics is the fact that AI has already demonstrated its capabilities of gathering information from multiple sources

at the same time while performing effective feature extraction to achieve accuracy prediction models.

Case study

In the context of overall salary increases and pressure of cost-cutting large organizations always have looked to outperform and step in first in the new digital age. As a result, a Top 500 company in Power & Utilities with a global presence in over 100 countries has asked the company I collaborate with for help with the implementation of a multi-functional Intelligent Automation solution and a Center of Excellence setup. The challenges the client was facing at that time were strong connected to low customer service due to long-term time and high error rate, significant human hours effort spent on repetitive tasks, high pressure dealing with old and new customers' demands while maintaining a high level of quality, increased customer support costs due to extra reports and key information requested, increasing costs with developing employee skills and non-integrated systems that can boost the company switch to digital.

Not surprisingly the entire organization was working nonstop around the clock, which leads also to the high level of attrition rates and a poor image of the company on the labor market. Therefore, a key series of correlated actions were necessary to address these challenges and to implement Intelligent Automation and Center of Excellence setup. First of all, we conducted a detailed feasibility assessment in a three-day workshop with the key process owners for all in-scope processes and developed a business case. The processes involved were spread multiple functions, such as Finance (e.g. Procure to Pay, Order to Cash, Record to Report, Intercompany transactions and General Ledger), Client operations (e.g. Hardware change requests, Credit payments, and Credit requests, Plan renewals and Tariff upgrades), Human Resources (e.g. Employees boarding, Employees training requests, New employee registration, Annually Employee Promotion Letters) and Network Operations.

We designed and implemented for the aforementioned processes five business solutions: (1) Robotic Process Automation for the most of the suitable processes that must ran from on a specific day and hour, (2) ABBYY Flexicapture + Robotic Process Automation for dealing with Procure to Pay and Order to Cash clients invoices with non-standard formatting, (3) Chatbots and Robotic Process automation for Employee training Requests, for Client request of contract change and/or hardware renewal, for Client payments), (4) Machine Learning for Tariff upgrades and Intercompany transactions, (5) Artificial Intelligence (i.e. IBM Watson) to handle complex processes that consume impressive amounts of energy and power and which cannot be done during the day due to network bottlenecks and system network traffic. As a result, Watson learned by itself when is the optimal time to run and do the analysis and reports requested. These were done mainly during the nights when the network traffic was low and when no other activities highly energy intensive were done (e.g. maintenance across the company, updates on software, back-up, and recovery activities and other scheduled activities). Moreover, we created a Center of Excellence (CoE) structure and operating model, as demonstrated

by Anagnoste (2018). On top of the CoE, we designed and implemented a self-sufficient Intelligence Automation team, trained the team in each solution deployed so that other departments and processes will be transformed going further and we created a business model to handle client support of these intelligent automation solutions.

Under these initiatives, the organization has deployed more than 100 robots across the organization covering more than 120 processes. The overall time dealing with all these processes has decreased by 35%, removing thus a huge amount of stress from the employees' shoulders. The responding time to external parties (i.e. vendors or clients) has improved by approximate 25%, hence making the company one of the best performers in terms of services and digitization in the industry. The advantage of the first-mover further associated the company with technology, innovation and a cool office environment where to come to work. As a results job requests have increased by 130% which led also to lower costs for the organization with recruiting (e.g. lower costs with online jobs platforms where a post cost on average 100 euro to be made publically, lower costs with job fairs, lower costs with compensating employees for job referrals etc.) and lower overall attrition.

One of the most consuming operations was related to handling Intercompany reconciliation where invoices from more than 100 countries had to be dealt with. The new processing time was down 25% and 45% on the most complex parts of it. These changes have been seen impacting positively the Service Quality and the Customer satisfaction scores, mainly due to newly enhanced capacity to handle peak volumes using cognitive and machine learning capabilities. An official second phase of the project will involve only work done by the client and will aim to extend to the usage of these technologies to other offices and processes.

Conclusions and implications

The current paper has important implications in the business world of intelligent software automation because the first results of the proof of concepts and pilots have started to appear on the market. We already have seen these changes on the Romanian market: Telekom providers using virtual assistant voice to handle client interaction, Banks using RPA to handle faster client requests (e.g. card PIN unlock), Power & Utilities companies using Artificial Intelligence to optimize consumptions demand, Law companies using advanced OCR capabilities to deal with contract processing and so on.

Intelligent Automation (IA) and Artificial Intelligence will have a tremendous impact on the market, which can be compared with the appearance of the internet back in the '90s. The only thing to cope with this change that will affect hundreds of millions is a radical transformation of our educational system. As mentioned in the paper "Robotic Automation Process - The next major revolution in terms of back-office operations improvement" (2017) Romania is a hub to numerous global Shared Service Centers which employ more than 100,000 – mainly performing low value-added and repetitive tasks. It is exactly this kind of jobs that created in Romania a

middle class and which represented the starting point to hundreds of thousands or even millions. While what can be done to tackle these challenges should be addressed in further research, the current paper aims to raise key questions to the usage of Intelligent automation, such as:

1. How do you cope with digital disruption and stay relevant through increasing customer demand by using automation as an enabler for overall transformation?
At some point, each company who wants to continue operating in the near future has to adopt and embrace these changes. Those who will not act at all or just minimal will be left behind by other organizations and current and future employees alike. Change takes time and can create a lot of uncertain environments but finally when stabilized will end up creating a new organization – the 21st-century organization.

2. How do you truly focus your people on smarter tasks rather than exception handling by combining digital, automation and AI to achieve end-to-end automation?
In the Power & Utility company from the current case study three things happened after the implementation of Intelligent Automation: (a) Humans started to work side by side with the robots, which in the next five to ten years this will be industry standard, (b) Humans have performed or attended a series of workshops and trainings where they acquired new skills in order to work and exploit to the maximum these technologies and (c) employees switched from creating repetitive reports (i.e. daily, weekly, monthly etc.) to spending more time interpreting them and coming up with solutions and proposals to the findings. Having more free time resulted in starting over 30 internal pilots on different efficiency driven activities.

3. How do you build a strong automation pipeline and implement quick wins to gain momentum by finding the right opportunities and most suitable solutions?
As demonstrated by Anagnoste (2018) the RPA automation potential is significant. If an organization adds on top the Intelligent Automation potential described in Table 2 than we are talking by a combined automation saving than is more than 50%. Reaching this potential means investing time in workshops with process owners in order to perform a detailed and correct process assessment, sharing the lessons learned from previous automated processes and especially from those who were not were recommended for automation, constantly performing internal trainings of the tools capabilities so the key owners should know what can be done and what cannot and other related activities.

We also observed that people were afraid of proposing processes to automate due to the fear that they will end up with no activities to fill the work-schedule (i.e. full-time or part-time). This is a sensitive topic and organizations should address them from case to case (e.g. moving an employee from repetitive work to data interpretation, encouraged to learn new skills etc.).

4. How do you ensure a secure, stable and scalable operation by modifying your overall operating model and controls to manage your new digital workforce?
A digital workforce is facing challenges of the new world working environment. Organizations must be sure that all audit trails, system warnings and checks, and balances are properly set up. That is why a role of Digital Chief Officer must be in place so that his team can handle this on a daily basis.

His role will be also recruiting and making sure his new or old team members acquire the skills needed to perform not only on the current platforms but also on platforms and software that are on the rise (e.g. Machine Learning, Python etc.).

5. How do you attract and retain the best talent by re-thinking the role of your people as they shift from mundane tasks to innovation, strategy, and relationships? Transforming into a digital company will give you more leverage on a shrinking labor market, not only in Romania but also in Europe, in general. In the following years the Z generation, those born between mid-1900 and mid-2000, are starting to join the labor market. This generation it the first generation to be born with internet access and most of them are already digital (i.e. owning at least one of the following: smartphone, tablet, laptop or PC). The newcomers in the workplace will be facing from the beginning new working models, will embark on a digital transformation mission and will connect and disseminate the working results with peers in ways that foster innovation. Concluding, high-impacting changes are underway to disrupt every part of the organizations and governments alike. Volunteering to join the fourth "industrial revolution" will have a tremendous weight for organizations to be on the market in the next ten years.

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