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Integration of RPA with AI & ML

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***Abstract*:- This is the era of digitalization – speed and operational efficiency. Organizations, especially in the banking and finance space where businesses handle huge volume of sensitive data, can and do benefit from the implementation of robotic process automation (RPA). The complementary use of Machine Learning (ML) and Artificial Intelligence (AI) heightens speed and accuracy of business processes and transactions. This article evaluates the rationale of integrating AI and ML with RPA and highlights the opportunities and challenges faced by the organizations while implementation and provides broad suggestions to overcome those challenges.**

Keywords*: *RPA, robotics, process automation, robotic process automation, AI, artificial intelligence, ML, machine learning.

1. INTRODUCTION

This is the era of "digital transformation" and the ongoing industrial revolution has this transformation as one of its key features. The term is relatively novel in contemporary business and technological literature. By and large, digital transformation is stated to be the incorporation and amalgamation of digital technology into commercial practices that results in modification of business operations and delivers value to customers through superior quality of services (Micic, 2017). It also refers to the vicissitudes that result from the extensive use of digital technology, through which processes are generated and data is shared, and transferred. It has its roots in the development and progression of several technologies, that include software engineering, computer technology, networks involved in telecommunications and the consequences of applying these technologies. Artificial Intelligence is perceived to be a crucial instrument for increasing the speed of digital transformation in this region (Khalifa, Elghany, & Elghany, 2021).

Organizations and businesses especially in the financial services industry can benefit greatly from the use of Process Automation. Such businesses continuously churn huge volumes of sensitive information-intensive and witness rich data flows. Process automation is achieved largely through the use of robotics in a process called Robotic Process Automation (RPA). However, the higher complexity of the algorithms used in Machine Learning (ML) has expanded the likelihood of integration of classic RPA with Artificial Intelligence (AI), thus leading to the new era of Robotics 2.0 (Jha, Prashar, & Nagpal, 2021).

Nevertheless, the change over from RPA to Robotics 2.0 draws in more than one challenges (de Boer, 2018). It is necessary to effectively tackle these issues in order to make sure that the benefits of the modern technologies can be reaped and fully exploited. It is possible for businesses to automate more advanced and complex tasks employing AI. These tasks hitherto required and had always received assistance that human perceptual and judgment skills. Such automation will involve integration of RPA with various cognitive technologies including machine learning, speech recognition, and natural language processing (Jha, Prashar, & Nagpal, 2021).

This article provides insights into this new approach of intelligent automation that is based on successful integration of artificial intelligence with robotic process automation in intelligent commercial systems with special emphasis on banking and finance. The purpose of this chapter article is to highlight the benefits and the need for integrating RPA with AI and ML. It also identifies the set of challenges the would be faced, and also provide guidance on the ways these challenges can be handled, preparations to be made for effective integration to ensure full scale implementation of Robotics 2.0.

2. DIGITAL TRANSFORMATION IN BANKING & RELEVANT TECHNOLOGIES

In this era of industrial revolution even the banking sector is undergoing revolutionary change in terms of operations and customer service. Digitization is the name of this transformation. Digitization refers to the process of conversion of information into a digital format while digitalization refers to the facilitation or enhancement of processes through the use of digital technologies to utilize digitized data (SEN GUPTA, 2020). Due to the nature of the business banks have the ability to pull together and analyze huge volume of customer data that can help them garner insights into behavior customer and preferences while improving customer experience and bringing novel customized products and services to the market (Singh, 2023).

Digitization has made it possible for banks to exploit the potential and capability of both data analytics and artificial intelligence (AI) for making improved business decisions and offering to customers superior personalized services. Through the collection and analysis of customer-centric data, it becomes possible for banks to adapt themselves to the changing business environment and modify and customize their services with the purpose of meeting the precise requirements of individual customer.

Robotic process automation or RPA has emerged as a key instrument for digital transformation and is among the best instances of digital technologies that has the ability to take

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shape as per the need of the processes that is being transformed through automation (Intelligent RPA, 2022). Digital Process Automation focuses on the automation of processes with the objective of providing enhanced customer experiences, reduce operating costs and improve functional efficiencies by freeing up labor for higher value tasks. However, the limited ability of RPA to provide end-to-end process automation along with several other challenges makes it imperative for enterprises to look beyond RPA to make complete digital transformation a reality (Bandhu, 2022).

3. UNDERSTANDING THE CONNECTION BETWEEN RPA, ML & AI

The benefits that can be derived from automation-led digital transformation are huge and irrefutable. Automation increases accountability, enhances efficiency, offers better predictability, and at the same time reduces cost, removes inconsistency and lowers risk (Moore, 2016). As the number of initiatives towards digital transformation starts increasing at a rapid pace, several enterprises across the world are turning towards exploiting the power of automation for supporting their efforts at digital transformation (Bandhu, 2022). The need of the hour is "intelligent Automation" which demands a judicious mix of RPA, AI and ML. To understand the true potential of such automation it is essential to understand the connection between these technologies.

3.1 Robotic Process Automation

Robotic Process Automation or RPA is defined as a software that has been preconfigured using certain predefined set of activities and business rules that works towards completing in an autonomous manner, a mix of process executions, tasks, activities and transactions, using multiple software systems that are unrelated with the purpose of delivering a result or service without any human intervention for management of any exception that might occur (IEEE, 2017). According to this definition, RPA results in the reproduction of work carried out by humans through the automation of their jobs. The key motivation behind such transition are reductions in cost, operational flexibility, higher speed and utilization of resource, enhanced service capabilities and superior quality. Majority of the organizations have been able to overcome the initial circumspection associated with the application of any novel technology and robotic process automation is no exception. The application of RPA is believed to deliver such fundamental benefits as time saving and lower expenditure as software robots execute specific given jobs with higher speed, better accuracy, and tenaciously for a duration that usually surpasses any human capability (de Boer, 2018).

There is no limit to the uses of the RPA tools. Any task that is repetitive in nature and follows definite rules can be executed using software bots. This is the key reason why RPA has emerged as a powerful yet flexible tool that is not dependent on any industry or any department. The only thing that limits the number of tasks where RPA can be employed is the imagination of the user. Robotic process automation also fast-tracks a process and at the same time strengthens it (Intelligent RPA, 2022).

RPA is amongst the fastest-growing technologies in a large number industries in general, the financial sector in particular and its effectiveness has an important part to play in majority of companies that are struggling to overcome the bureaucracy related to paperwork and discourage and dissuade lowly data entry (Schulman, 2023). Apart from being extremely exasperating, these processes are also prone to a lot of errors and inaccuracies.

RPA functions through the acceleration of processes, digitization, and the auditing of data. However, despite all these abilities, RPA on its own does not have the capacity to provide effective solutions to the business organizations. It does not have the ability to automatically and independently conclude a process that is reliant on the actions of individual customers (Schulman, 2023). Other technologies are needed to complement RPA for successful digitl transformation of business organizations.

3.2 Artificial Intelligence

At present, the Fourth Industrial Revolution (4IR or Industry 4.0) is underway and digitization and digital transformation are the key features of this revolution. This digital world has generated a huge volume of rich data, including business data, health data, social media data, mobile data, cybersecurity data, Internet of Things (IoT) data, etc. All these data need to be processed and analyzed. For intelligent analyses of such data and subsequent development of the analogous applications that are smart and automated, it is essential to possess the knowledge of artificial intelligence (AI), especially, machine learning (ML) (Sarker, 2021). AI refers to the "science and engineering" of designing and constructing machines that are intelligent, specifically computer programs that are called intelligent. It is not required for AI to restrict itself to using only those methods that can be observed biologically although it is associated with tasks akin to employing computers that can help to understand human intelligence (McCarthy, 2007). ML is quite a bit connected to Artificial intelligence. Several disciplines of research and industry are extensively using Machine learning (ML) and artificial intelligence (AI) as their leading problem-solving techniques, not least for the current successes of deep learning (DL) (Kersting, 2018).

2.2.1 Machine Learning

Modern civilization has come to rely heavily on the internet and associated technologies. A huge volume of data is generated at every step in the transactional processes that are at the core of every business activity carried out using the internet. This copious amount of data generated can be analyzed to generate valuable insights into business activities that can be utilized for increasing operational efficiencies, cost rationalization, streamlining production, providing superior consumer satisfaction, etc. Needless to say that this processing of large amounts of data is not possible for the human mind. It is beyond their cognitive abilities. Machine Learning (ML) provides a route for humans to process huge bulk of data, gain insight into the

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processes which generate the data being analyzed and make judicious decisions based on the analysis carried out. (Injadat, Moubayed, Nassif, & Shami, 2021). Machine Learning, hence, finds wide ranging applications in various industries. A large variety of machine learning algorithms for instance reinforcement learning, supervised, semi-supervised, and unsupervised learning are available within the premises. Apart from the *deep learning*, that constitutes a wider category of methods used for machine learning, has the capability of analyzing, intelligently, the data on a much larger scale (Sarker I. H., 2021).

In the contemporary period, artificial intelligence capabilities are provided by intelligent systems which frequently depend on machine learning. The presently available set of Artificial intelligence applications rely on Machine Learning capabilities of the system. ML, therefore, refers to the capability of the machine to learn from relevant data that is generated during each specific transaction and utilize this problem specific training data for the automation of the task of building analytical models and complete associated tasks (Janiesch, Zschech, & Heinrich, 2021). Machine learning (ML) is a comprehensive term which clubs together a wide array of algorithms which are capable of carrying out intelligent predictions on the basis of data analysis. Very often, these data sets would be large, may even consist of numerous unique data points. These data sets could also be humongous and it has been seen that recent developments in the field have provided a human level of understanding of the bigger picture alongside the mechanical extraction of information and sometimes the capability to identify abstract patterns with far greater level of precision compared to human experts (Nichols,, Chan, & Baker, 2019). ML has come to play a significant part in intelligent automation.

3.3 Intelligent Automation

A substantial portion of technological development on the modern era is concerned with the automation of service work and knowledge because of the advances in AI and its associated fields. This phenomenon is described by the term Intelligent Automation (IA) (Coombs, Hislop, Taneva, & Barnard, 2020).

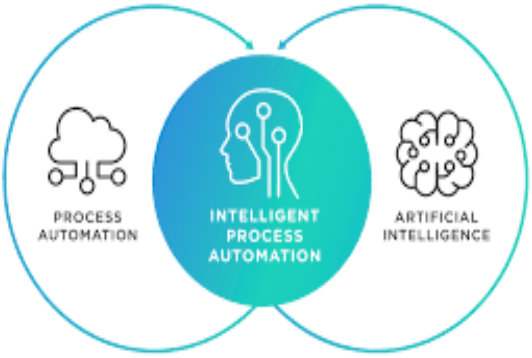

Figure 1: Intelligent Automation

Intelligent Automation or IA, therefore, refers to the amalgamation of Robotic Process Automation or RPA and artificial intelligence or AI technologies which collectively enable swift end-to-end business process automation and increase the pace of digital transformation. A judicious blend of RPA, with its crisp task execution with Artificial Intelligence (AI) especially machine learning and technologies bring about automated process discovery and process analytics as well as cognitive interfaces such as computer vision, mirror action record and retrace, Natural Language Processing (NLP) and fuzzy logic which in turn empowers acceleration of digital transformation of business process by a substantial magnitude is a broad definition of Intelligent Automation.

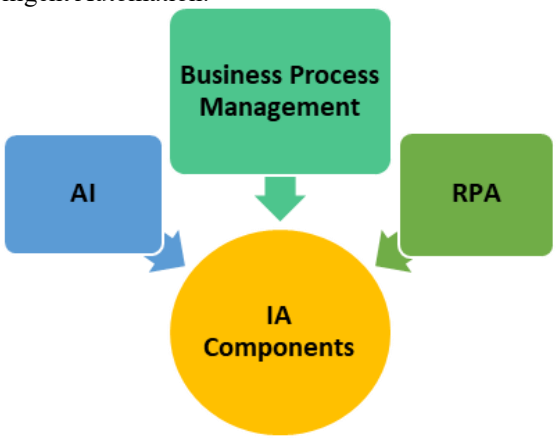

Figure 2: Components of Intelligent Automation

IA, therefore, involves integration of robotics with a number of components from various emerging technologies. Such digital enablers as intelligent automation present remarkable possibility for consumption and leveraging of the huge volume of data that is generated by devices that are part of IoT and can help to develop valuable insights while enabling a digital ecosystem that is well-linked in its truest sense (Parikh, 2020).

Beyond a doubt, it has become increasingly imperative for businesses to adopt automation in order to improve efficiency and increase precision. Such developments through the transformation of service work and knowledge provides organizations with a novel strategic opportunity for improving their business value (Coombs, Hislop, Taneva, & Barnard, 2020).

3.4 The Interrelation Between the Technologies and Intelligent Automation

An increasing number of businesses have adopted RPA functions to automate routine, monotonous and tedious tasks. However, at times, they require higher competences. Introducing machine learning functions in tandem with robotic process automation results in what is called "intelligent automation" that is capable of learning and adapting, unlike RPA (Morgan, 2021). RPA functions through the simple execution of its programming. Hence, with every change of requirements, it becomes essential to reprogram the RPA (Pratt, 2021). Machine learning, on the other hand, being more dynamic makes it possible for RPA to adapt quickly to the changing situation. RPA is short of intelligence. It has to be spoon fed for every step action it takes or modification it needs and undergoes. Intelligent automation brings together machine learning and such other AI techniques (Paysse, 2021), as computer vision and Natural Language Processing (NLP), depending on the use

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case. Is it possible that AI would replace RPA completely? The likeliness is almost zero since everything that requires automation does not require machine intelligence (Sutner, 2021). Intelligent automation (IA), which is occasionally also referred to as cognitive automation, involves employment of automation technologies such as artificial intelligence, business process management (BPM), and robotic process automation that helps to streamline and balance decision-making across organizations (IBM, 2023). Intelligent Automation or IA, works through exploitation, control and integration of RPA with cognitive technologies (Automation Anywhere, 2023). It is possible for businesses to automate high level complicated tasks that were hitherto accomplished using perceptual and decision-making skills of human resources takin help from AI (Khan, 2019).. This can be achieved through the integration of cognitive technology such as machine learning, speech recognition, and natural language processing with RPA (Morgan, 2021). Together with RPA, AI makes automation of exceedingly intricate commercial tasks possible in real life. An incredibly wide array of AI capabilities along with multi-layered and profound RPA functionality are inherently implied by any claim made towards automate any business process, end to end, (Automation Anywhere, 2023). Intelligent automation from one end to the other is necessarily a combination of robotic process automation and artificial intelligence (AI) — can provide many benefits that aid in the digital transformation of an organization.

3.5 What it Means for Banks

Process automation achieved through the application of Artificial intelligence is about to transform operating models of banks and other financial institutions. The professed intelligent automation is anticipated to alter the daily routine of bank employees and their customers. In case of financial institutions such as banks, the technology entails a substantial improvement in terms of sales revenue and cost efficiency will start to emerge with the implementation of intelligent automation. The initial experiences gathered from the use of systems supported by AI suggest that there could be almost 80% reduction in the time required for processing a service. This would mean that soon customers would be able to enjoy much shorter wait times and a level of transparency pertaining to the stages of processing their service requests, that was hitherto unseen. Intelligent automation that combines AI with RPA unshackles employees from repetitive and tedious jobs that, more often than not, tend to become burdensome. This allows these employees to focus on tasks that have a higher creative and inventive connotation. Nevertheless, the two concepts cannot be used in a interchangeable ma (Rudisail, 2022). An increasing number of banks are beginning to change over to automation of standard processes in-house or outsourcing them to IT service providers. Over the next 5 years at least, these areas will see standard the automation, and somewhere near the middle of the approaching decade, the next upgradation to a more advanced technology will probably become the new normal. Natural language processing and other AI-supported methods are likely to perform context-based processing of complicated data derived from customer-application (Lehneis, 2023).

Banks, powered by Digitization, have been able to leverage the supremacy and competence of data analytics and artificial intelligence (AI) when it comes to making improved business decisions and provide to customers personalized services. Through the collection and analysis of customer data, it will be possible for the banks and other financial institutions to customize their services to address the precise needs of individual customer (Singh, 2023).

4. RATIONALE BEHIND & BENEFITS OF INTEGRATION

Markets are becoming increasingly competitive and organizations look for advantages that are capable of generating better results in such markets (Moraes, et al., 2022). The banking sector has seen steady growth since its inception. It is no longer discretionary for financial institutions to resort to digital innovations in the contemporary banking environment. In fact, digital innovations have become indispensable for financial institutions for being able to cope with a progressively aggressive market and fluctuating customer expectations (de Oliveira Santini, Ladeira, Sampaio, & Perin, 2018).

Intelligent automation platforms present the opportunity to derive several advantages from their application in a number of industries. The benefits ensue from the churning of huge volumes of data, meticulously correct calculations, analysis of relevant data and implementation of the results to improve and expand business. Following are the key benefits that could be derived from the adoption of intelligent automation:

- ***Reduction in the costs through the enhancement and betterment of the workforce and improvement in its productivity:*** Automation of the systems and processes along with the usage of data and analysis in order to guarantee the precision of the production process can increase speed of production. Along with this IA also imparts the ability to rapidly scale up the business without adding to the risk, or compromising the quality of the service provided, or putting unnecessary pressure on the prevailing employees. The benefits of this knowhow are being harvested by business leaders across the globe through better yields from production and improvements in the ROI (IBM, 2023)
- ***Improvement in accuracy due to consistency of processes and methodologies, which work towards the enhancement of quality:*** The key power supporting intelligent automation is the application of artificial intelligence for driving the decision-making and bringing a consistency in the approach towards recurring and monotonous tasks (IBM, 2023). A client of the IT major, IBM, from the finance industry employed RPA very recently in order to create bots that were assigned with the task to automate the production of management reports scheduled for release once every month (Tucker, 2021). This automation was helpful in eliminating the errors that had earlier made their way into the

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process due to data entry that were made manually. This in turn helped in enhancing the accuracy of the said reports and several similar ones. Additionally, the speed of data processing and automation of the extraction of data from sources can be enhanced through the application of Optical Character Recognition (OCR) (IBM, 2021).

- ***Improvement in the customer experience:*** Improved customer service entails providing a better or superior quality, more dependable product to market faster and consistently, or speeding up the process of getting answers to queries and minimizing the waiting time. This also helps to provide an experience to the customer that is not only richer but also more positive. In turn the company will derive competitive advantage and strengthen its position in the industry.
- ***Addressing with confidence the issues pertaining to compliance and regulations:*** It is necessary for a number of industries to stick to particular regulatory policies. It is possible for intelligent automation to leverage its features pertaining to automation of tasks in order to substantiate an approach to compliance that has higher consistency. (IBM, 2023)

Banking sector digitalization is a relentless process that is being integrated into the regular workflow without disrupting operations. Consequently, a slow evolving process takes shape which has an effect on both internal and external stakeholders and affect the environments they operate in. The redesigning and revamping of processes are documented as SoPS (Standard Operating procedures) and these SoPs become the guiding principles for various avenues to make digital transformation reaches the remotest region without actual physical braches, different market strategy from their competitors as well as cutting operational costs phenomenally (Kitsios, Giatsidis, & Kamariotou, 2021).

If there is one sector which has grown by leaps and bounds and continues to expand even as this is being written, it is the financial sector. Although the Banking sector did take a hit during the pandemic but with general lockdown being imposed, people gravitated towards digital banking for their daily needs. The digital transformation had already been affected by the financial sector much earlier, however it was the effect of the pandemic and lockdown which made the people become conversant with digital transactions as well as take time to understand the benefits of different services and actually avail those benefits. Digital transformation has opened up a vast playground with unique tailormade services made possible through online platforms, mobile applications and other digital channels. This has led to an educated customer to understand the pros and cons of each individual service and make an informed decision best catering to his financial need (Singh, 2023)..

Today, the majority of services being currently provided by financial companies and institutions are in the form of digital services. The fourth industrial revolution, Industry 4.0 and in its technological progress and automation of mundane, repetitive tasks being assigned to bots has revolutionized and these new advancements are claiming themselves to be the major changes in the sector (Ribeiro, Lima, Eckhardt, & Paiva, 2021). RPA is an all-encompassing technology which can be integrated into any industry, the biggest adopters have been banks, NBFCs, insurance domain, telecommunication and utility sectors. Such Industries have dated conventional legacy systems and choose RPA to bridge the gap with their newly implemented systems. RPA provides the backbone to integrate with existing functionality (Omale, 2018). It is the proficiency to incorporate the legacy systems which acts the key driver for implementation and subsequent success RPA projects. Through the use of such technology, it has become possible for the organizations to swiftly accelerate the pace of the initiatives adopted for digital transformation, and at the same time unlock the value that is connected with past technology investments (Gartner, 2019).

Robotic Process Automation provides a wide range of advantages though the automation of administrative and business processes of an organization. Supplementing these advantages is the integrated use of Artificial Intelligence algorithms and practices thereby allowing to improve the accuracy and speed of the process of extraction of information generated during any commercial transactions which in turn is utilized for understanding, categorizing, collating, forecasting and deciding the optimum utilization of resources. Further to this, the paper strives to present a detailed study of RPA tools which can be integrated with AI that will lead to overall improvement at the organization level processes that are associated with Industry 4.0. It has been observed that RPA tools enhance their functionality with the objective of extension of AI processes which in turn uses Artificail Neural Network algorithms. Text Mining softwares and Natural language processing techniques for information extraction, subsequent process of mining useful information and then forecasting hypothetical scenarios to improve operational and business processes of organizations as well as carrying our mock drills to ensure smooth operations even in a crisis (Ribeiro, Lima, Eckhardt, & Paiva, 2021).

The success of automation is dependent on its being intelligent and smart which demands combining RPA with AI. Artificial intelligence (AI), more specifically, machine learning (ML) has grown phenomenally and swiftly over the last few years in the context of data analysis and computing that typically allows the applications to function in an intelligent manner (Sarker I. H., 2021). ML has evolved and grown substantially in past few years primarily in the area of data analysis and computing that paves the way for the application to function in an independent and intelligent manner. In general, ML imparts such capacity to the systems which makes it possible for them to learn and enhance from experience automatically without requiring any specific programming and is generally referred to as the most popular amongst the modern technologies in the fourth industrial revolution (4*IR* or Industry 4.0) (Sarker, Hoque, Uddin, & Tawfeeq, 2020) . ML typically provides systems the ability to learn and use previous learning experiences.

By combining RPA with cognitive technologies such as machine learning, speech recognition, and natural language

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processing, companies can automate higher-order tasks with AI assist that in the past required the perceptual and judgement capabilities of humans (Khan, 2019).

5. Misconceptions about Intelligent Automation

There exist several misconceptions about IA adoption that pose the threat of slowing down the phenomena, but they can be easily clarified and dismissed. Some of these misconceptions include the following:

- **IA will completely replace the human workforce:** IA will act as a complement and not as a substitute of human labor. It actually supplements the augments raised by the human workforce by taking over repetitive tasks so that the human workforce has the bandwidth to work on more complex issues or more pressing administrative matters, thinking workforce is available to work on more complex or more pressing matters. IA increases the accuracy of the business results for the mundane tasks it undertakes by reducing the need to check and resolve errors. These kinds of tasks cause delay in the system and workforce from other projects are also pulled in. IA also brings forth new opportunities involving new skills that would require some amount of training. The human workforce thus has a great opportunity to upskill and develop their career with much sought-after skills now a part of their profile. Without the use of IA repeated attempts at increasing the accuracy of the outcome for each and every task involved in the business process can result in latency and may need the pulling off resources and other projects. It creates new opportunities centered around new skills that can be developed through retraining. For the human workforce, this provides an exceptionally good opportunity to revive their skillset and build a stronger background for future growth. IA also brings forth new opportunities involving new skills that would require some amount of training. The human workforce thus has a great opportunity to upskill and develop their career with much sought-after skills now a part of their profile.

- **IA is a technology that would offer added advantages, but is not necessary:** IA is no longer an option that companies can dilly dally on. Automation enabled applications are more of a norm than an exception and impact our daily routine from speaking to Alexa to getting personalized weather forecasts. Similarly, in business houses, AI is needed to keep pace with competitors, staye abreast of the market and most importantly engage and satisfy the consumers. Organizations using manual processes just can keep pace with the fast moving and ever-changing scenario of markets. On top of that Automation improved overall quality of goods and services by error reduction during production and fastening the pace of production by increasing the speed of repetitive processes. Organizations that fail to adopt IA will struggle to stay afloat leave aside attaining success or market competitiveness.
  Thus it can be aid that IA is no-longer just one of the many available option. Our daily lives are filled with applications that are infused through automation and that is the most dominating among the prevalent technologies, such as speaking to Alexa or using a weather app. In a similar manner, in business, IA has become an imperative rather than a choice to survive and sustain in a rapidly growing competitive business arena as it helps businesses stay competitive and be able to effectively address the needs of the customers. Organizations using manual processes just can't keep up the pace. Not only that, but automation improves the quality of the product and quality of customer service by reducing errors and increasing the speed and efficiency of repetitive processes. Organizations that don't adopt IA will struggle to succeed.

- **IA is capable of making decisions that are unbiased:** It must be kept in mind that AI is not completely independent of human intervention. After all AI programs are developed by humans. Where ever there is human involvement there will be an element of bias involved. IA prepares decisions on the basis of input collected and established, the bulk of which is situational data and is provided by individuals and organizations in charge of that input. Therefore, the decisions made are inherently biased (IBM, 2021). It is obvious that IA formulates decisions primarily on data gathered from previous transactions, these inputs are primarily gathered by individuals and organizations which may be flawedand not objective in the real sense of the term. Therefore decisions made based on these erroneous inputs are liable to be inherently biased. Complete removal of human intervention is not possible.

6. CHALLENGES OF INTEGRATION

Infrastructure and Operations (I&O) automation processes the implementation of IT tasks and workflows governing processes and can either augment or replace manual IT processes. The advantages include quick responsiveness to customer and market demands, leaner logistics based on IA reduces logistic cost and efficiency, increases the reliability of meeting consumer demands and risk mitigation. Cultural resistance has kept the maturity of the automation technologies and processes at the elementary level (Panetta, 2019) there is a severe dearth of technical skills that are necessary for the implementation of intelligent automation. There is also present an overall lack of investment in automation capabilities has lessened the pace of automation maturity. There also exist an overall scarcity of investment in automation capabilities. Culture poses huge challenges when it comes to implementation of any change – and RPA entails a radical organization-wide change (Panetta, 2019).

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All is not rosy with the adoption of IA is not without challenges. However, those challenges can be effectively addressed. A few of these challenges are the following:

- **It is possible to bridge the gaps in skillsets and knowledge** through the retention of staff or partnership with a Process as a Service vendor who is capable of setting the IA in motion and manages on behalf of the organization implementing it.
- **Ambiguity related to the business process** becomes a challenge in case the processes within the business organization lack proper understanding. Process mining (Machines, 2023) and process discovery provide remedy for this challenge by way of assisting businesses with process mapping that is considered to be a necessity prior to embarking on an IA implementation (International Business Machines, 2023).
- **Insufficient emphasis on standardization** is witnessed by anyone implementing IA. There is absence of any standard approach to automation. Hence, every vendor of automation product will in all probabilities approach the same process in a different manner. The degree of difference between two approaches will also vary. This is likely to be challenging in case an organization decides to change over to a new vendor. There is a plethora of vendors and organizations are in continuous discussion on the existing challenges, which gives rise to the hope that the standards are likely to improve in the forthcoming future.
- **Challenges pertaining to the identification of opportunities and development of a platform for automation** is a challenge that can be addressed by a partner. A large number and category of partners have the capability to solve this, from systems integrators to SaaS (Software as a Service) vendors to PaaS vendors, all of them concentrate on selection of the automation software and the solution that is expected to work best for the organization under consideration.
- **Insufficiency of tools that are required for the development and execution of an end-to-end solution** can actually stall, if not halt the adoption of IA even way before the process of adoption begins. In case an organization has the necessary skills within the house or has the capacity to retrain the existing team members, they will have the confidence to ensure that proper RPA tools, such as software robots, have been put in place. It is also possible to remedy this through partnership.

7. CONCLUSION

There is no doubt that intelligent automation is of tremendous value in today's world, across industries, is unmistakable. Along with the automation of monotonous recurring tasks through the application of IA-based RPA, it is possible for businesses to reduce their costs together with the establishment of higher consistency within their workflows. The COVID-19 pandemic has been a huge factor in expediting the digital transformation and in streamlining the efforts, fueling higher level of investment on the infrastructure that would be necessary to support intelligent automation across industry. With the significant surge in remote work roles have and will continue to evolve. Individuals that continue to focus on low-value work are most likely to be reallocated for the implementation and the scaling up of these solutions as also for other tasks that belong to a higher level. It will be necessary for the middle managers to move their focus on to those elements of their job that are considered to be more human, in order to sustain motivation within the workforce. Automation will also be capable of exposing the gaps existing in the skills of the workforce within an organization, and it will become an absolute necessity for employees to adapt to their incessantly transforming work environments. It will also be necessary for the middle management to completely support such transmutation in a way that can mitigate the prevalent anxiety in order to make sure that it is possible for the existing employees to remain resilient throughout these periods of transformation. Beyond a doubt, Intelligent automation comprises the future of work, and companies that buck this trend of adoption of intelligent automation are most likely to find it extremely challenging and difficult to remain competitive and buoyant in their respective fields of business.

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