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SCIENCE FOR A SMARTER WORKPLACE

Automation

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Special thanks or other notes...

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Introduction

The world of work is changing. Companies are under more pressure than ever to compete in an environment that is increasingly volatile, unpredictable, complex, and ambiguous. In order to keep up with their competitors, companies are turning to automation. Automation is the process by which a task or procedure is performed with decreasing human assistance. Automation will change work for employees with varied types of jobs, from CEOs to cashiers to fashion designers (Manyika et. al., 2017), because automation will affect parts of jobs rather than entire professions. This is contrary to what has been popularized by online media: that a certain percentage of jobs will be eliminated due to automation. Some jobs will be more at risk to change than others, but only 5% of jobs are candidates for full automation (Manyika et. al., 2017). The authors of this white paper discuss a brief history of automation, the expected skill sets of working professionals in the age of automation, and the role various business professionals play in the future of work.

IBM, the birthplace of a playful artificial intelligence (AI)-based suite of cognitive services known as Watson, defines automation in a nuanced way, differentiating between foundational, advanced, and intelligent automation. Foundational automation is data- and rule-based automation around repetitive tasks that can eliminate errors and increase productivity. Some form of foundational automation exists in 91% of companies today, according to IBM (2017). Advanced automation takes it to the next level with natural language processing, analytics, machine learning, and robotics. Intelligent automation drives autonomous thinking in organizations to achieve a goal that has been specified by the organization. Based on this perspective of automation by one of the leading organizations in the world on this topic, we can start to see that although mass automation will likely change the nature of jobs, it will not eliminate the workforce. New skills will be required to maintain automated functions.

In 2019, 5 of SIOP's top 10 workplace trends related to technological change and advancements in the workplace; these included automation of jobs and tasks, working with big data and people analytics, artificial intelligence and machine learning, the changing nature of how people work, and data visualization (SIOP, 2019). This was up from 4 of the top 10 in 2018 (SIOP, 2018). The world of work will experience continuous change, and HR and business professionals are uniquely positioned to optimize their impact rather than reactively respond to changes. As the automation of job activities accelerates the speed of change and the nature of work, it is crucial that the field of I-O psychology prepares accordingly and looks to support all professionals during this shift in work. Leaders of this change must first understand the history of mass automation at work to prepare for future changes.

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Background

In the early 1800s, employees experienced automation during the Industrial Revolution (Pursell, 2007[1995]) in the form of modernized mass production and manufacturing. The Industrial Revolution improved the standard of living for the middle and lower socioeconomic classes. The digitalization of our world in the 20th century connected the world via advanced infrastructure like the telegraph and railroad networks. Although not overlooking ethnically targeted and inhumane working conditions like during the building of the transcontinental railroad (Bain, 1999), a direct result of these mass automations was an increased amount of available jobs for working-class citizens and an improvement in their standard of living (Ashton, 1997). Another rapid change is occurring again through what is being referred to as the Fourth Industrial Revolution or Industry 4.0 (Marr, 2018), in which the automation of our digitized world will transform the world of work once again.

Perhaps the growing tension around work automation stems from people's perception that half of the workforce can be impacted by automation without understanding how they might be affected. McKinsey & Co. highlight a realistic impact of automation. Instead of looking at which jobs can be automated, the organization focuses on which tasks can be automated. McKinsey & Co concluded that only 5% of jobs can be fully automated, and even 20% of a CEO's job can be automated (Lin, 2017). Further, about 30% of the tasks that make up about 60% of jobs can be automated (McKinsey Global Institute, 2017). The opportunity lies in utilizing automation to the organization's advantage. Organizations have endless amounts of processes, and by taking away the more tedious tasks, they can increase efficiency and time allotted for other tasks, and shift focus toward more critical business priorities.

What types of tasks can be or are likely to be automated? Jesuthasan and Boudreau (2019) discuss the factors by which a task can be categorized when considering its automatability; tasks can be defined based on being repetitive versus variable, independent versus interactive, and physical versus mental. Organizations that view work through these factors will be able to identify which tasks are going to be the easiest to automate. Then, decision makers in those organizations will need to analyze the costs and benefits of automating the work.

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Repetitive tasks are those that do not change much over time, remain the same within a variety of work processes and contexts, and are predictable and routine. Variable tasks, however, are unpredictable and require adaptive criteria and decision rules (Jenuthasan & Bondreau, 2019). Independent tasks are those that are carried out with minimal or zero communication or interaction with others, whereas interactive tasks are those that require teamwork or effort by others to complete. Finally, physical tasks are manual in nature, whereas mental tasks require cognitive abilities. Based on these categorizations of work, repetitive, independent, and physical tasks are more easily automated and are at higher risk of automation throughout the future of work. These tasks are more easily automated because the rules that guide them are simple, unchanging, and require only one person to complete.

Implications for Practice

Repetitive tasks like data entry or payroll, with easily definable and unchanging rules are easier to automate than those that are constantly changing like the work of a landscaper or maintenance worker, which runs contrary to the popular belief around which jobs can be automated (McKinsey Digital, 2017). It is possible that in the near future, work activities and tasks will be automated for portions of work, and jobs will change or be consolidated accordingly. Physical work like that of an assembly worker in a manufacturing line is easily automated with a variety of robots combining AI, sensors, and mobile equipment to work together (Jenuthasa & Bondreau, 2019). However, mental work like that of a contractor and architect working together to create designs for a new home on an empty lot or a school counselor working with a struggling student requires deeper cognitive activity and creativity that would be much more difficult to automate.

How can workers adapt to the future of automation? Ghislieri, Molino, and Cortese (2018) describe how workers oppose automation because of fear. However, it is important to recognize that previous generations had to adapt their ways of working despite their initial fears, like learning to use a computer for the first time. The human–machine merge of mass automation is one area on which HR practitioners can focus. Although jobs will continue to change, HR professionals can apply their expertise to help assuage workers' fears, whether by preparing workforce planning strategies that can help upskill workers, improve processes, or coach leaders, or holding educational sessions and guiding workers towards avenues of growth and learning in the marketplace.

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HR and business leaders can embrace the following roles in helping the modern workforce adapt and prepare for the increasingly automated workplace:

- Student: stay up to date on the quickly evolving world of automation, AI, and machine learning to understand trends and how to apply them to your workplace.
- Educator: inform workers about the reality of work automation (tasks vs. complete jobs).
- Scientist: test and experiment with automation in the workplace by innovating or adopting new ways of working one task at a time.
- Coach: build organizations composed of leaders who are ready to deal quickly with a changing workforce and the associated expectations.
- Connector: work to merge organizational technological understanding with human capital strategy; the technological skill gap will be the likely weakness across organizations as automation becomes increasingly adopted.

Another way that HR professionals can make an impact is to decrease the human bias that can negatively influence mass automation. This is part of the work that I-O psychologists have been doing for years prior to increased automation. Therefore, as automation increases the speed of work and decision making, programming the detailed processes of automated work can have serious implications. If decisions are being made by technologies

that were programmed by humans in ways that can result in adverse impact, pre-emptive action must be taken to mitigate these risks. Such action already exists today. IBM Watson Recruitment has a built in adverse impact analysis that identifies bias related to age, race, gender, education, or previous employer (IBM, n.d.). This ability in IBM Watson Recruitment will allow HR leaders to more comfortably rely on AI to assist in hiring practices without causing bias on an organizational level. Although AI like IMB Watson Recruitment is helping organizations hire the right individuals for open jobs, it is also working to ensure adverse impact practices and maintain compliance with legal standards. This is an important development in the effective functioning of AI tools in the workplace.

Next Steps

The world of work seems to be changing at an accelerated pace and will continue to change beyond the next few years. Automation will play a big role in this shift. In this time of transition, business and HR professionals can step into unprecedented levels of influence. First, they can help to align the future of work by guiding and coaching those in power to prepare the workforce accordingly. Second, they can help individuals proactively navigate their careers across changing boundaries (Arthur, 1994).

How can business and HR professionals play an active role in this shift? With proactive application and using I-O psychology and its expertise as scientific backing, organizational leaders can become an even more central part of reshaping the workforce of the future. Creative ways of upskilling and educating the workforce will be key to both individual and organizational success. As geographical boundaries of work continue to be broken with improvements in technology, the successful teams of tomorrow will likely be dynamic and adaptive, working in partnership with technology and automation rather than against it. As the influence of organizations and technology grows with the modernization of the developing world, the heuristics and biases associated with these organizations will also grow. The authors encourage readers to reflect on the world they want to create. Invest in organizations that reflect the values you want to see in the world of tomorrow. Through the powerful investment of the individual in partnership with allied organizations, I-O psychologists, business leaders, and HR professionals can have an active role in creating, inspiring, and producing science for a smarter workplace.

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