



The Future of Industry and Employment: COVID-19 Effects Exacerbate the March of Artificial Intelligence

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Introduction

Before the COVID-19 public health crisis, many industries and occupations were experiencing transformational pressure as the economy shifts toward a largely digital landscape. In previous studies on this subject, the estimated impacts of artificial intelligence (AI) and other advanced computer technologies (ACT) on industries and occupations have varied widely based on study methodology and country—but almost all analyses point to substantial disruption in labor markets due to AI.¹ Intuitively, occupations that are at the highest risk for either elimination or substantial changes in required skills are those characterized by routine tasks that do not require complex decision making.

In Georgia, similar patterns of at-risk jobs are expected. Bluestone (2020) and Chike and Wallace (2020) estimate that approximately 50 percent of jobs in Georgia are at risk because of ACT. The vast majority of these jobs are among relatively low-paid occupations in Georgia and across the nation.

Effects of COVID-19

The ongoing public health crisis has not halted ACT's transformational pressure on employment and occupations. In fact, the pandemic may be increasing the speed of the transition toward automation because of social distancing measures and because concerns regarding the spread of the virus have forced the creative use of digital technologies in education, business and medicine, among other industries. The types of jobs at risk in the COVID-19 crisis are eerily similar to those affected

¹ For example, Bluestone (2020), Chike and Wallace (2020), McKinsey Global Institute (MGI, 2017)

by automation. While workers across the income distribution are affected by the current pandemic, industries with a large share of relatively low-wage occupations are bearing the brunt of the unemployment crisis.

During this time, governments, non-profits and the private sector have an opportunity to support displaced workers by offering innovative training and upskilling to prepare them to reenter the workforce. Without new training, those displaced initially by COVID-19 may find that as the economy recovers, their old jobs are no longer available and new jobs require skills they do not possess.

A recent study by MGI (2020) estimates the impact of COVID-19 on employment in major sectors in Europe; much of the same is expected for the United States. We use the MGI analysis to compare COVID-19 at-risk employment with automation at-risk employment using the North American Industry Classification System (NAICS) codes. In Table 1 below, the fourth column shows MGI (2020) estimates of the percentage of employment at risk, from highest to lowest, due to the COVID-19 crisis in sectors in Europe. The far right column shows the automation potential of jobs by sector in the United States, i.e., the percentage of work or tasks within a sector that could be automated (MGI, 2017). The columns are not apples-to-apples comparisons, but the takeaway is nonetheless daunting: Several industries with high

potential for automation are aligned with industries at risk for a large share of employment disruption from the COVID-19 crisis. About 75 percent of COVID-19 at-risk industries are closely matched with AI at-risk sectors.

Bringing these two sets of estimates together, the industries most vulnerable to COVID-19 and the march of ACT are:

- Accommodation and food services;
- Art and entertainment;
- Wholesale and retail trade;
- Construction; and
- Other services.

Many of these industries are dominated by occupations paying relatively low wages and requiring low levels of education, putting already vulnerable workers at higher risk for economic instability.

There are some notable differences in the disruption by industry. For example, the most visible variation is agriculture, with an estimate of less than 10 percent of jobs at risk due to COVID-19 (MGI, 2020) and 58 percent potential automation (MGI, 2017). This is understandable, as the virus lockdown cannot stop consumption and farmers are not likely to stop their production, although problems in transportation may affect production soon.

Table 1: Comparison of the Percentage of Jobs at Risk from COVID-19 and Automation

2-DIGIT NAICS CODE	NAICS SECTOR	MAJOR OCCUPATION	JOB'S POTENTIALLY AT RISK TO COVID-19 (% SHARE OF TOTAL SECTOR EMPLOYMENT FROM EXHIBIT 2)	SECTORS AT RISK TO AUTOMATION (AUTOMATION POTENTIAL % FROM EXHIBIT 4)
72	Accommodation and food services	Food preparation and serving	74%	73%
71	Art, entertainment and recreation	Personal care and service occupations	50%	41%
42	Wholesale trade	Sales and related occupations	44%	44%
44-45	Retail trade	Sales and related occupations	Not available	53%
23	Construction	Construction and extraction occupations	36%	47%
81	Other services	Personal care and service occupations	31%	49%
31-33	Manufacturing	Production occupations	21%	60%
22	Utilities, electricity	Not available	19%	44%
48-49	Transportation and storage	Transportation and material moving occupations	19%	57%
52	Finance and insurance	Office and administrative support occupations	18%	Not available
56	Administrative and support	Office and administrative support occupations	17%	39%
92	Public administration	Not available	17%	Not available
61	Education	Education, training, and library occupations	17%	27%
53	Real estate	Sales and related occupations	17%	40%
62	Human health and social work	Healthcare practitioners and technical occupations	16%	36%
54	Professional services	Office and administrative support occupations	11%	35%
51	Information and communication	Computer and mathematical occupations	6%	36%
21	Mining and quarrying	Not available	6%	51%
11	Agriculture	Farming, fishing, and forestry occupations	About 5%	58%

Sources: MGI (2017, Exhibit 4 representing the United States), MGI (2020, Exhibit 2 representing Europe)

Leading firms in the sectors above are already augmenting and transitioning occupations with digital technologies. The job dislocation of the COVID-19 crisis will likely accelerate this transformation, as automation is more appealing in a world of social distancing. Increased productivity may be the result in the long run. However, in the short run, this may exacerbate the problem of under-employment because those without sufficient skills might find it difficult to compete in a changed labor market when economies around the world pick up again. In addition, those who became unemployed during the pandemic may find themselves completely displaced by automation in the recovery.

Conclusions

In the long run, governments, non-profits and the private sector can support these doubly displaced workers. The U.S. government has taken herculean steps to shore up the unemployed. As a result, governments can use the timely and accurate information generated by these unemployment claims to identify workers who need help transitioning from the immediate COVID-19 recession as well as the imminent movement of jobs and industries toward AI and ACT. Moving forward, cooperative thinking between states and the federal government could unveil an innovative approach to skill redesign, upskilling, and retraining while these displaced workers remain eligible for unemployment benefits. Now is the time for higher education—colleges, universities, vocational, and technical schools—to be harnessed quickly to offer digital and other tools that will be increasingly in demand as the COVID-19 cloud lifts.

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