

A future that works: Automation, employment, and productivity

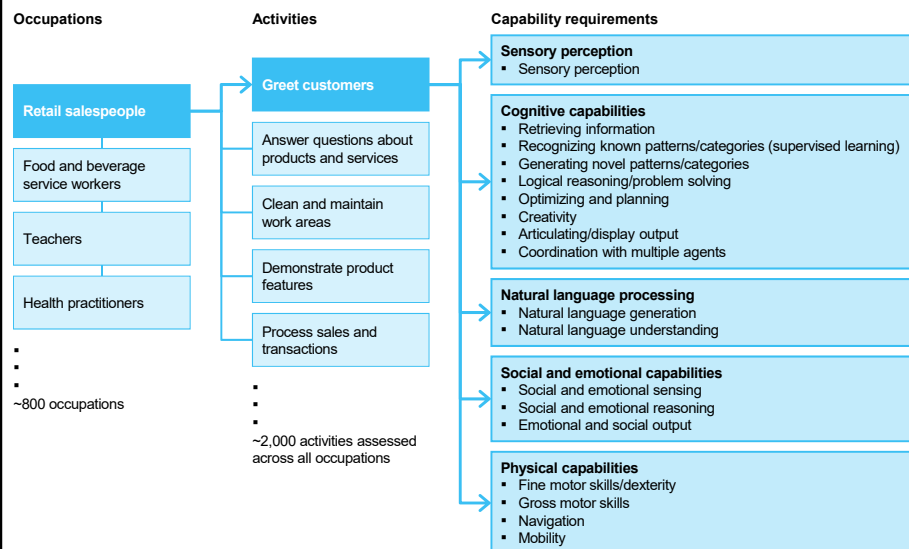


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To assess the technical potential of automation, we structured our analysis around 2,000 distinct work activities

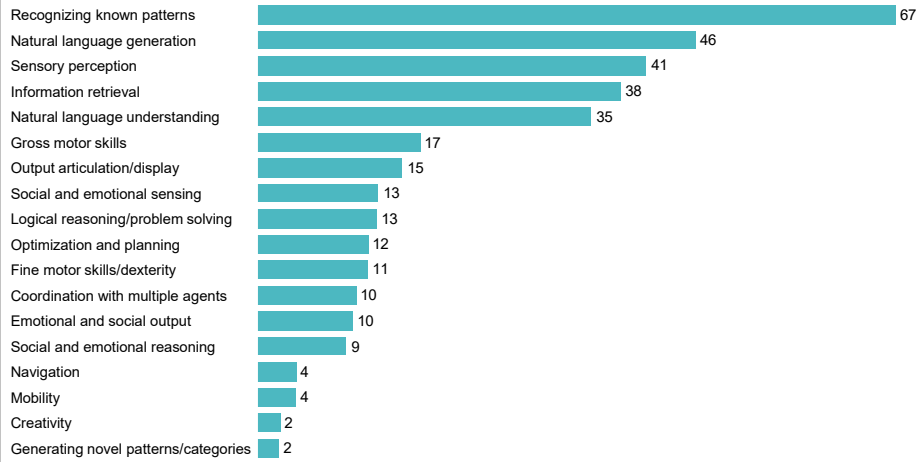


SOURCE: McKinsey Global Institute analysis

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Recognizing known patterns and natural language generation are the two most-used capabilities in work activities

Time spent by US workers on activities that require median or higher levels of human performance for each capability
% of time



SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

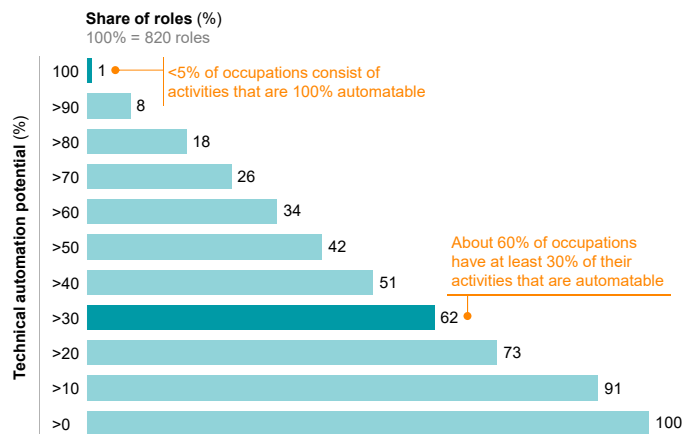
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While few occupations are fully automatable, 60 percent of all occupations have at least 30 percent technically automatable activities

Automation potential based on demonstrated technology of occupation titles in the United States (cumulative)¹

Example occupations

Sewing machine operators, graders and sorters of agricultural products
Stock clerks, travel agents, watch repairers
Chemical technicians, nursing assistants, Web developers
Fashion designers, chief executives, statisticians
Psychiatrists, legislators



¹ We define automation potential according to the work activities that can be automated by adapting currently demonstrated technology.

SOURCE: Source

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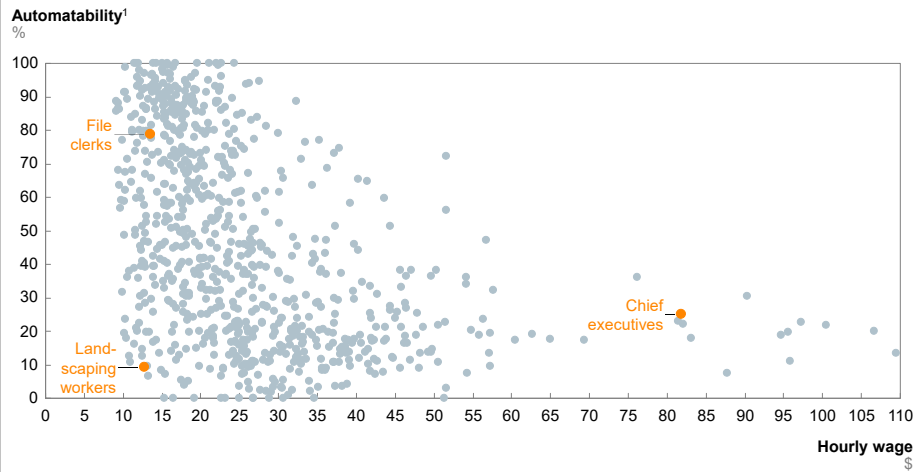
Technical potential for automation across sectors varies depending on mix of activity types



SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

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Both low and high-wage occupations have significant technical automation potential



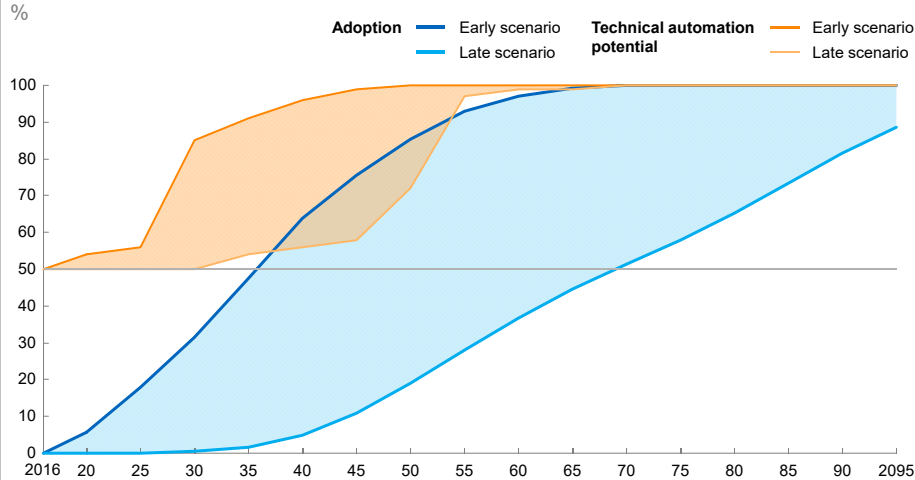
¹ Our analysis used "detailed work activities," as defined by O*NET, a program sponsored by the US Department of Labor, Employment and Training Administration.

SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

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Automation will be a global force, but adoption will take decades and there is significant uncertainty on timing

Time spent on current work activities¹



¹ Forty-six countries used in this calculation, representing about 80% of global labor force.

SOURCE: McKinsey Global Institute analysis

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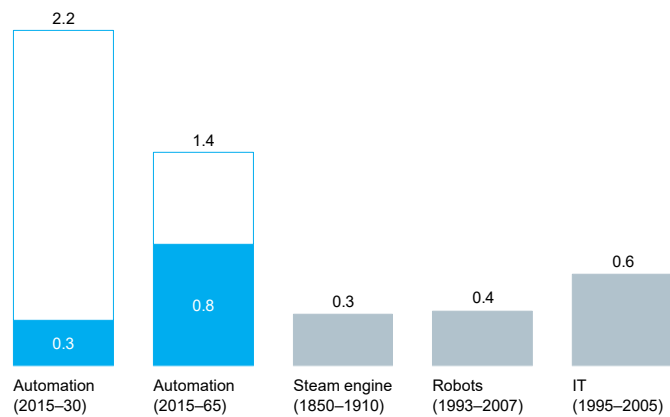
Automation of existing activities could increase productivity at magnitudes similar to other major technologies

Productivity growth

Compound annual growth rate

%

Earliest scenario Latest scenario



NOTE: We include multiple technologies in our analysis of "automation," so these technologies are not entirely comparable, but meant to provide an order of magnitude comparison.

SOURCE: Nicholas Crafts, "Steam as a general purpose technology: A growth accounting perspective," *Economic Journal*, volume 114, issue 495, April 2004; Mary O'Mahony and Marcel P. Timmer, "Output, input, and productivity measures at the industry level: The EU KLEMS database," *Economic Journal*, volume 119, issue 538, June 2009; Georg Graetz and Guy Michaels, *Robots at work*, Centre for Economic Performance discussion paper 1335, March 2015; McKinsey Global Institute analysis

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