

Middle- and Lower-Level Digital Skills: They're Not Glamorous but Matter a Lot

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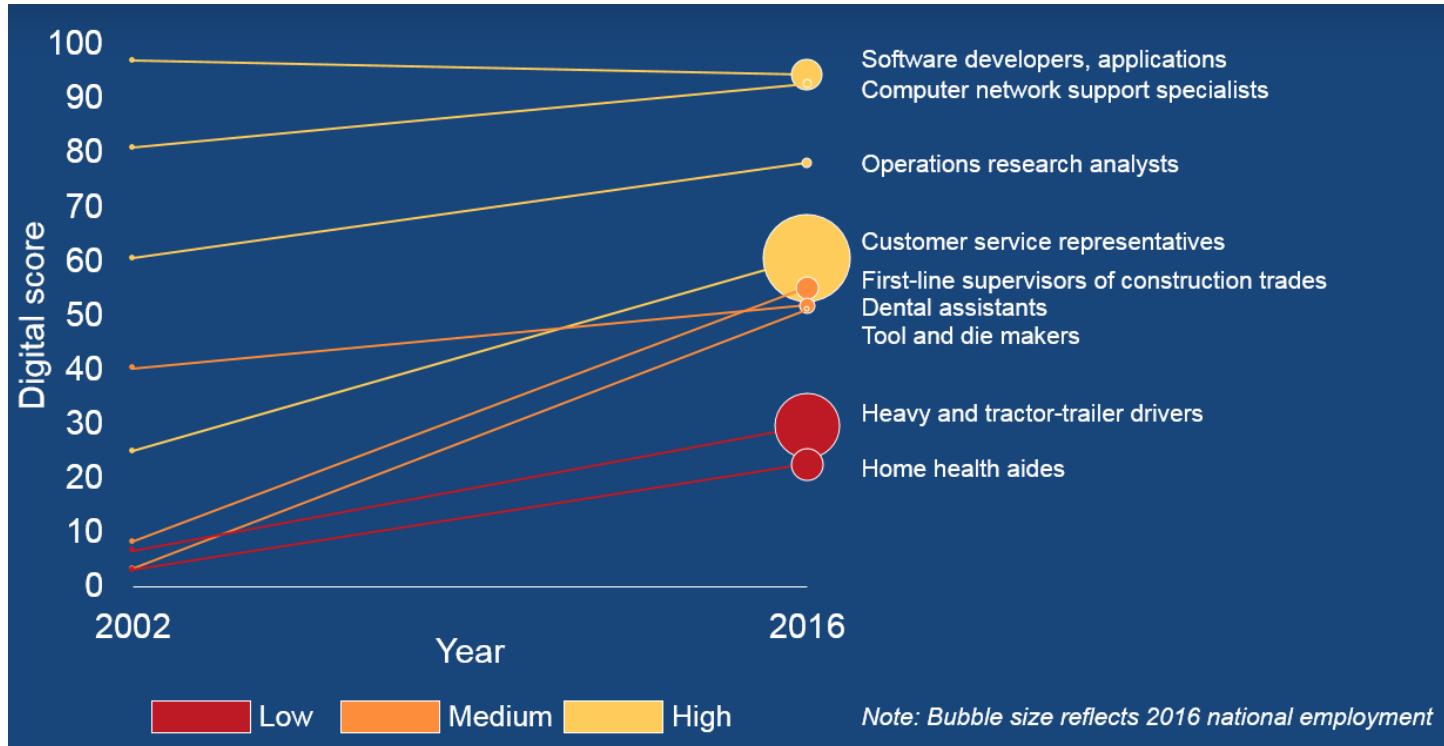
Look closely at the numbers in our [new Brookings Institution analysis](#) of the “digitalization” of the labor market and you see that the greatest change is occurring not at the top of the skills distribution, but at the bottom and middle.

Sure, the creation of many new jobs for highly skilled software developers and computer systems analysts is very apparent and is driving strong demand for IT professionals.

But even more striking are the dramatic changes now convulsing mid- and lower-skill occupations. Since 2002, the digital scores of middle-tier jobs like those of nurses and automotive service technicians have soared from the high-30s to the mid-50s on our 100-point digitalization scale even as lower-skilled workers such as home health aides and welders have seen the digital skills demanded by their jobs surge from a digital score of 3 to 23 in each case.

These are dramatic changes and here's how they look in a cool graphic made by my colleague Jacob Whiton:

Figure 1. Digital score change for select occupations



See that selected low- and medium-skill occupations were logging some of the fastest digital upskilling in the last 15 years. And see below that this pattern applies to many, many occupations that are playing out the pattern of especially fast digital adoption among low-to-medium skill roles.

Table 1. Select occupations ranked by 2016 digital score

Select occupations ranked by 2016 digital score			
Occupations	Digital score, 2002	Digital score, 2016	Score change, 2002-2016
Software Developers, Applications	97	94	-3
Computer Programmers	93	94	+0
Information Security Analysts	90	91	+1
Executive Secretaries and Executive Administrative Assistants	45	59	+14
Registered Nurses	38	55	+17
Social and Human Service Assistants	16	54	+37
Management Analysts	39	53	+14
Shipping, Receiving, and Traffic Clerks	22	52	+30
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	31	48	+17
Residential Advisors	4	47	+43
Teacher Assistants	16	42	+26
Flight Attendants	9	35	+26
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	3	33	+31
Industrial Truck and Tractor Operators	2	33	+31
Packers and Packagers, Hand	0	32	+32
Heavy and Tractor-Trailer Truck Drivers	7	30	+23
Home Health Aides	3	23	+19
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3	18	+14
Landscaping and Groundskeeping Workers	0	16	+16
Personal Care Aides	16	14	-2

Source: Brookings analysis of OES and O*NET data

These trends are striking and welcome. This explosion of upskilling in the lower half of the skills distribution reflects the critical dynamic of “catch-up” and potentially improved economic inclusivity. Here we see that the tech revolution that is transforming the world of work doesn’t just entail the exploits of PhD. artificial intelligence experts and data scientists, but also now encompasses nitty-gritty tech adoption in unglamorous but widespread offices, stores, doctor’s offices, and garages. What is more, many of these “everyday” occupations may be described as “on-ramp” or “opportunity” jobs – roles that pay better than average yet are accessible to workers without a BA, such as registered nurses, supervisors of production workers, radiologic technologists, real estate agents, and building inspectors.

As such, the digitalization of the sprawling bulk of the labor market conveys an encouraging picture of the nation’s economy, with the top to bottom adoption of productivity-enhancing technologies and processes, contributing to the prospect of heightened productivity and prosperity nationwide.

And yet, with that said, the rapid upskilling visible in Jacob’s graphic above also prompts concern. In this connection, the data and analyses in our report direct attention not just to high-flying Silicon Valley corporations with hyper-modern office furniture, but also downward and outward toward the massive change going on in regular America.

There across the middle and the lower end of the labor market, rapid digitalization is bringing not just new machines, practices, and opportunity, but also disruption and strain. With the digital content of mid-level jobs rising 30 percent (from a score of 43 to 55) and that of lower-tier jobs more than doubling (from 14 to 36), digital tools and processes are rapidly altering the tasks that workers are paid to do. This is changing the day-to-day nature of work in hundreds of occupations, bringing new demands and needs for training. In many cases, moreover, the rapid arrival of new technology, new

skills demands, and new roles for workers has likely contributed to the cloud of anxiety that has suffused views of the future as expressed by [polls](#). Those wondering about the agitated state of the nation's workers might want to consider the strains of the digitalization process as they spread through the economy.

In any event, workforce professionals, educators, and policymakers all need to take seriously that the nation now faces a massive digital inclusion challenge every bit as significant as the need for an expanded high-end IT talent pipeline.

Suddenly, virtually all workers – including those at the lower end of the skills continuum – need to obtain much more thorough digital competencies, whether for entry-level tech roles or to simply work in basic occupations in retail, health, or food service.

Nor is this quite the digital upskilling most workforce professionals have heard most about. To date, the nation's most high-profile, extensive, and creative digital skills training efforts (whether through coding courses, boot camps, or other accelerated learning models) have been geared almost entirely to the already digitally savvy and highly educated. In contrast, relatively little attention has been focused on the many more millions of workers at the lower end of the skills continuum who are grappling with even faster digital change – change that challenges their ability to land even low-tier, decent-paying jobs.

And yet, this need for basic digital literacy – whether it be for basic workplace productivity software exposure or the certifications needed to allow access to an entry-level IT administrator job – may be the most crying demand for skills building workforce training professionals face.

All of which suggests that the next phase of the digital skills push needs to add a new, less-glamorous focus on such IT basics as Microsoft Office and basic customer relationship management (CRM) software to the cooler agenda of scaling up the code schools. Though the training needs at the top of the digital continuum are critical, the changes underway farther down the spectrum are acute and call for much more attention if the nation wants to shape an inclusive advanced economy that works for all. Training professionals should direct their attentions there.

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Data on digitalization trends for 545 occupations and all U.S. states and metropolitan areas can be downloaded [here](#).