Digitalization

and the New Workforce Imperatives

Mark Muro
Brookings Metropolitan Policy Program
@MarkMuro1

Report Release Discussion
December 7, 2017

BROOKINGS

CITIES & REGIONS GLOBAL DEVELOPMENT

TRENDING U.S. FOREIGN POLICY MIDDLE EAST & NORTH AFRICA

REPORT

Digitalization and the American workforce

Mark Muro, **Sifan Liu**, **Jacob Whiton**, and **Siddharth Kulkarni** · November 2017

For media inquries, contact:

Anthony Fiano
MetroMediaRelations@brookings.edu
202.238.3113

DOWNLOAD

Full Report

In recent decades, the diffusion of
business and workplace, also kno
remaking the U.S. economy and t
of everything" has at once increased th
society while also contributing to a ser
inequalities, such as worker pay dispar
the divergence of metropolitan econo

B

1 Digitalization: What it is; why it matters

2 A new analysis and national trends

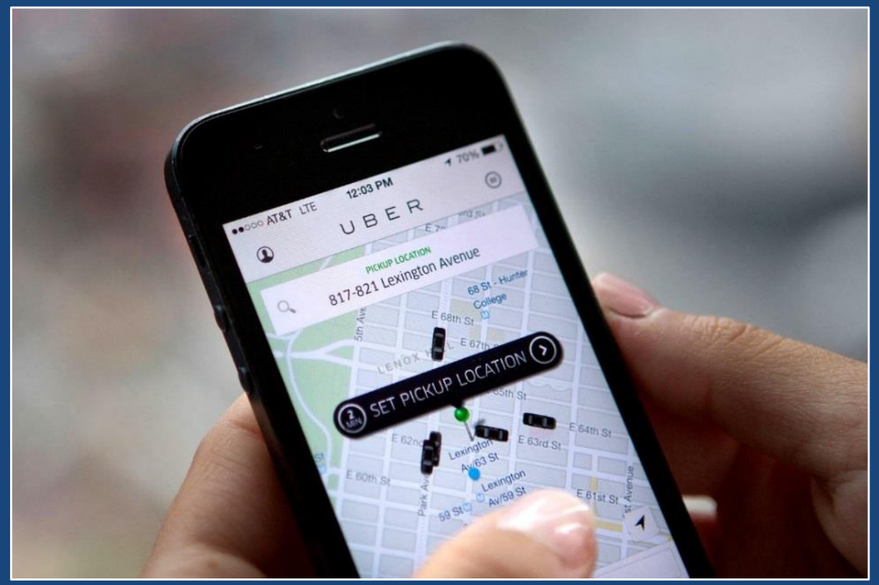
3 Implications for cities

What we mean by “digitalization”

Digitalization is the process of employing digital technology and data to transform business operations and create value

An explosion of digital tools is transforming nearly every industry

Office

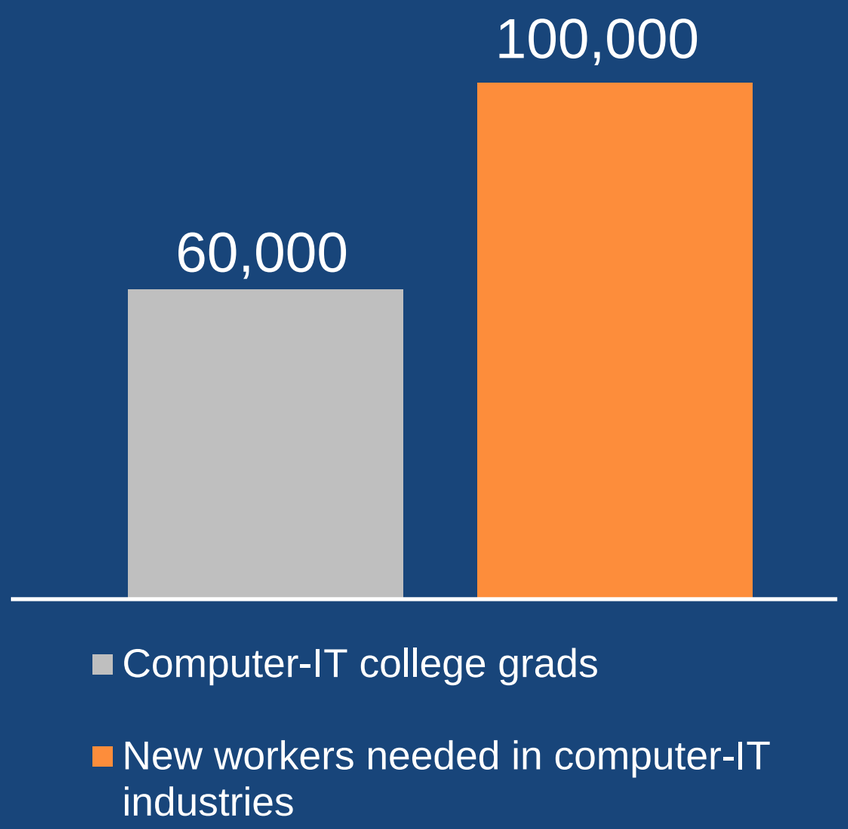


amazon web services™

B

Challenges include an IT skills shortage and limited overall digital proficiency

Annual computer/IT college graduates versus U.S. labor market needs, 2014 - 2024



Source: BLS Presentation, 2016

1 in 6

working-age Americans are unable to use email, web search, or other basic online tools

Source: OECD

1 Digitalization: What it is; why it matters

2 A new analysis and national trends

3 Implications for cities

How we analyzed digitalization

545 occupations

91% of the U.S. labor force

Two categories of O*NET digitalization data

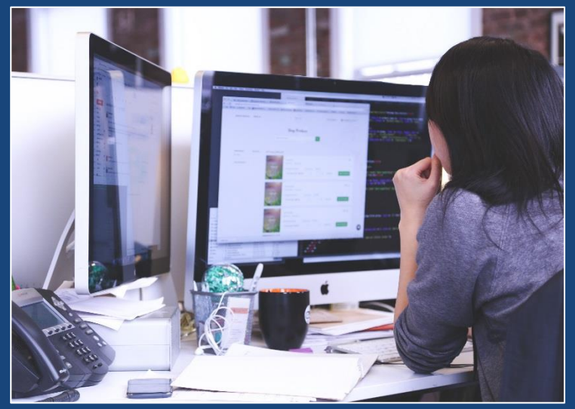
- Knowledge of computers and electronics
- Interaction with computers

Comprehensive digitization score from 1 to 100

Software developers	94
Electrical engineers	77
Lawyers	58
Mechanics	55
Registered nurses	55
Security guards	31
Restaurant cooks	18
Construction laborers	17
Personal care aides	14

We sorted occupations by high, medium, & low digital requirements

High
(scores above 60)

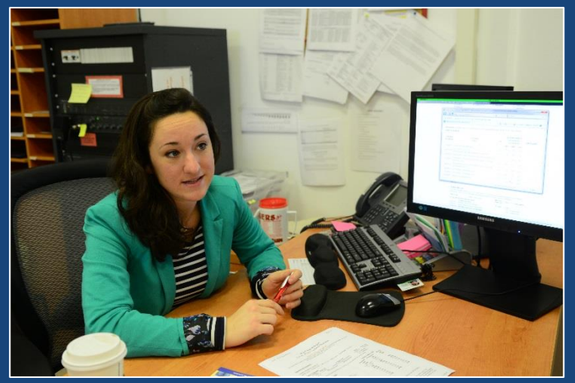


Software developers

Financial Managers

Medium
(scores between 33 and 60)

Registered nurses



Office clerks

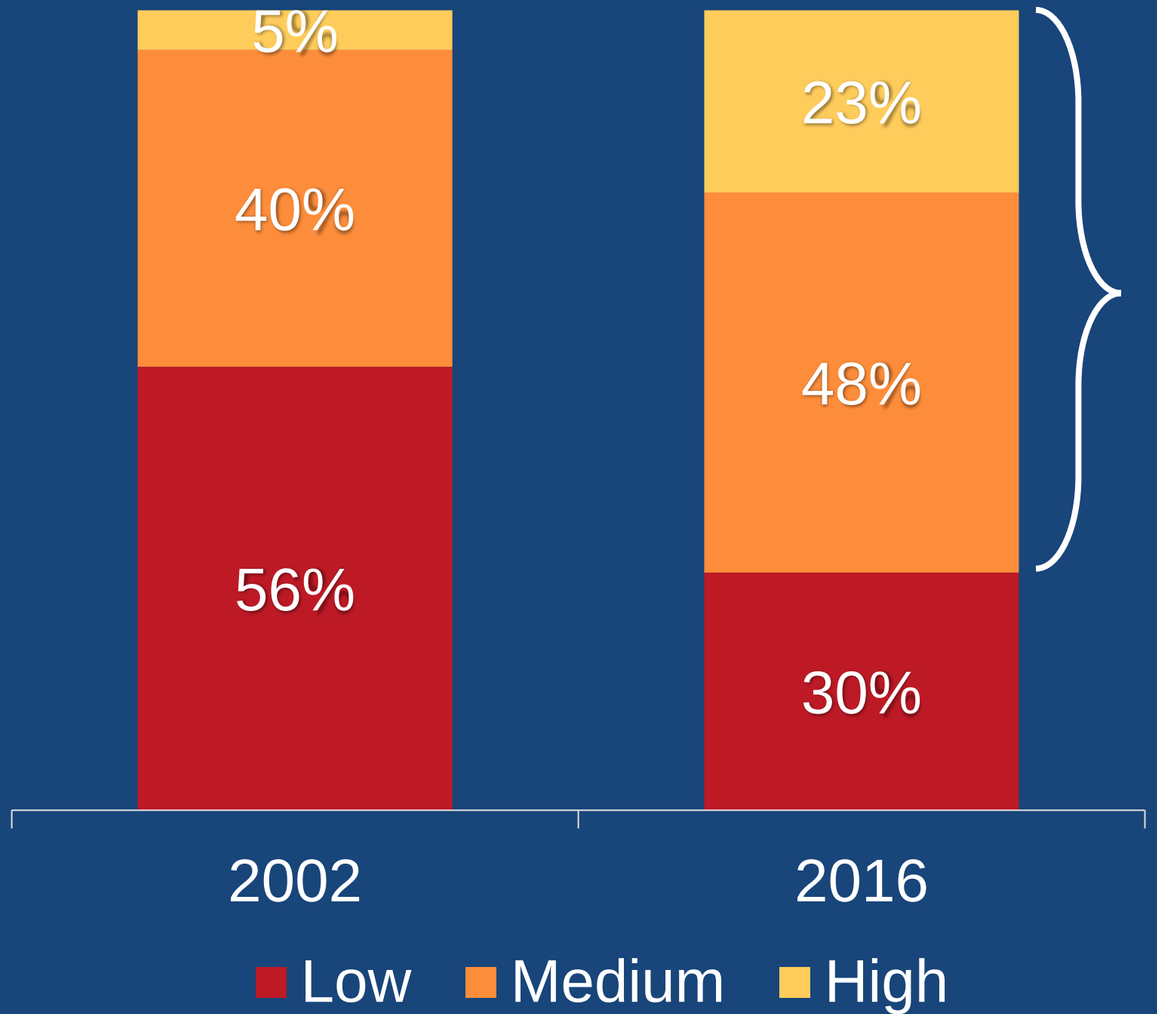
Low
(scores below 33)

Construction laborers

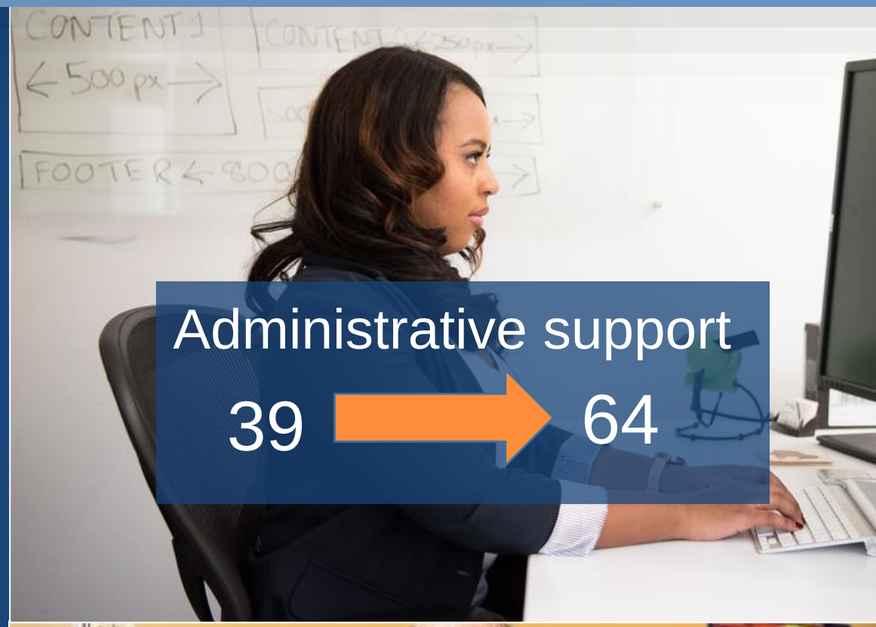
Personal care aides

The share of jobs requiring high & medium digital skills has skyrocketed

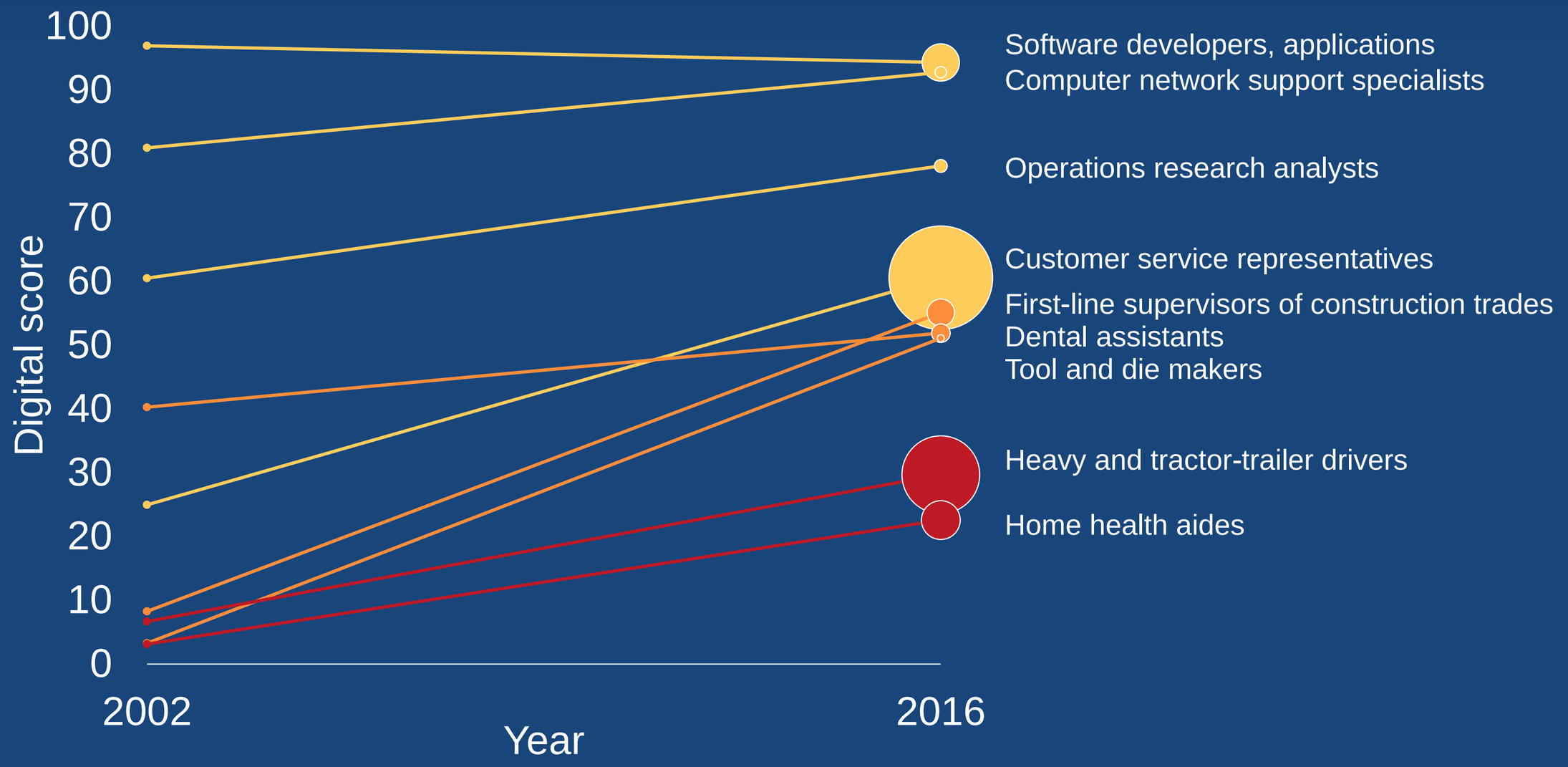
Share of U.S. employment by digital skill level



70% in Medium or High

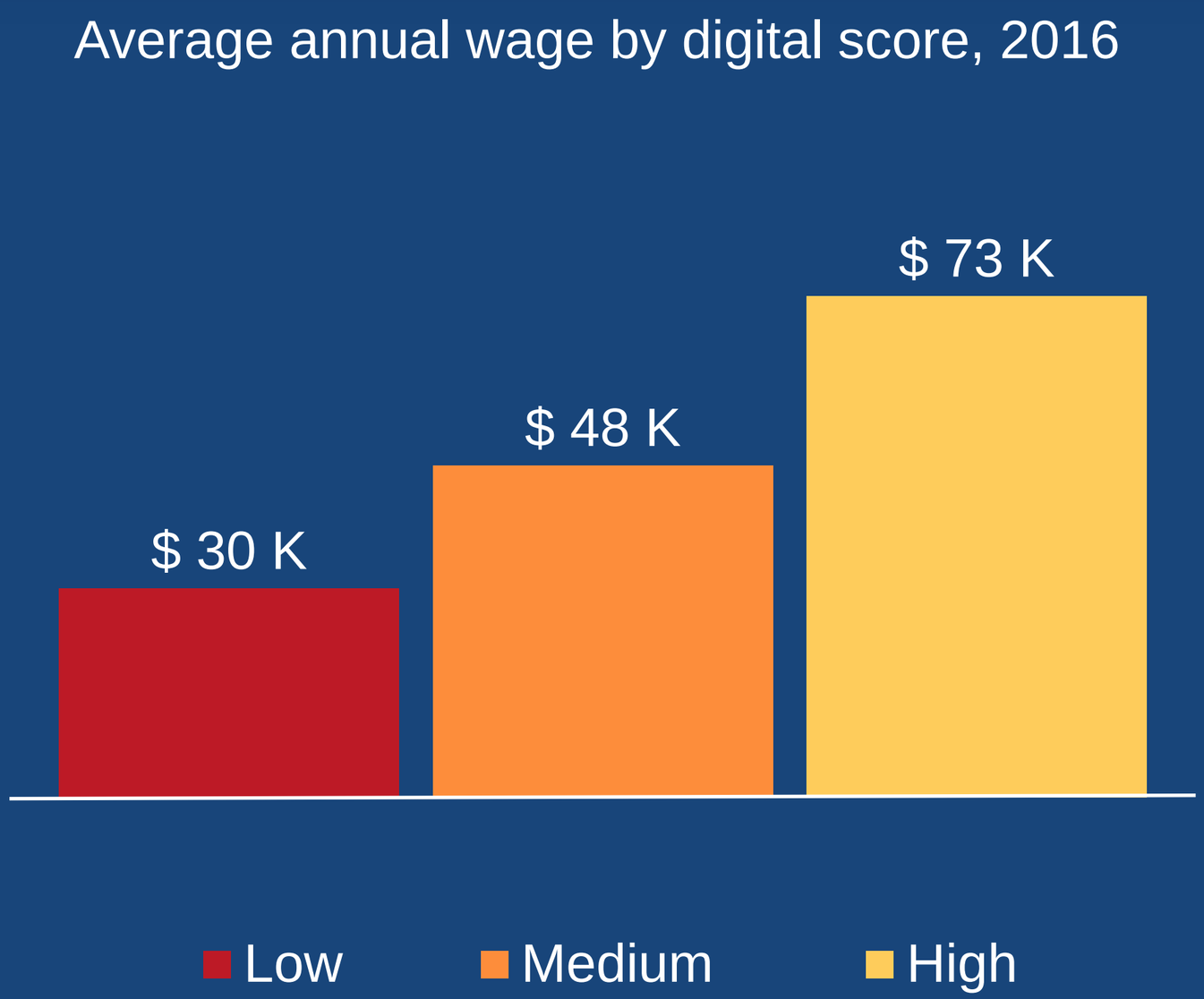


Low- and medium-digital occupations have been upskilling rapidly



Note: Bubble size reflects 2016 national employment

Tech empowers: Digitalization brings higher wages



And tech contributes to industry productivity

Industry group	Mean digital score, 2016	Avg. wage CAGR, 2010-16
Professional, Scientific, and Technical Services	55	1.4%
Finance and Insurance	55	1.8%
Media	52	3.0%
Management of Companies and Enterprises	51	2.2%
Healthcare services and Hospitals	46	1.0%
ICT	44	4.8%
Utilities	44	2.0%
Oil & Gas Extraction	43	-0.3%
Educational Services	41	0.0%
Retail Trade	41	0.9%
Advanced Manufacturing	39	0.9%
Transportation and Warehousing	33	0.9%
Basic Goods Manufacturing	33	0.8%
Construction	33	1.4%
Nursing and Residential Care Facilities, and Social Assistance	32	0.9%
Accommodation and Food Services	30	1.7%

Digital “know-how” is not, however, distributed evenly

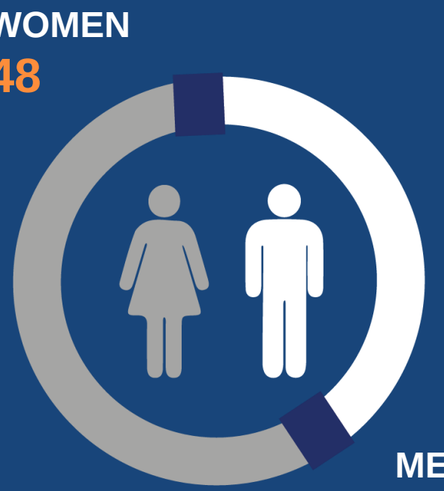
DIGITAL SCORE:

ASIAN
51

WHITE
48

BLACK
44

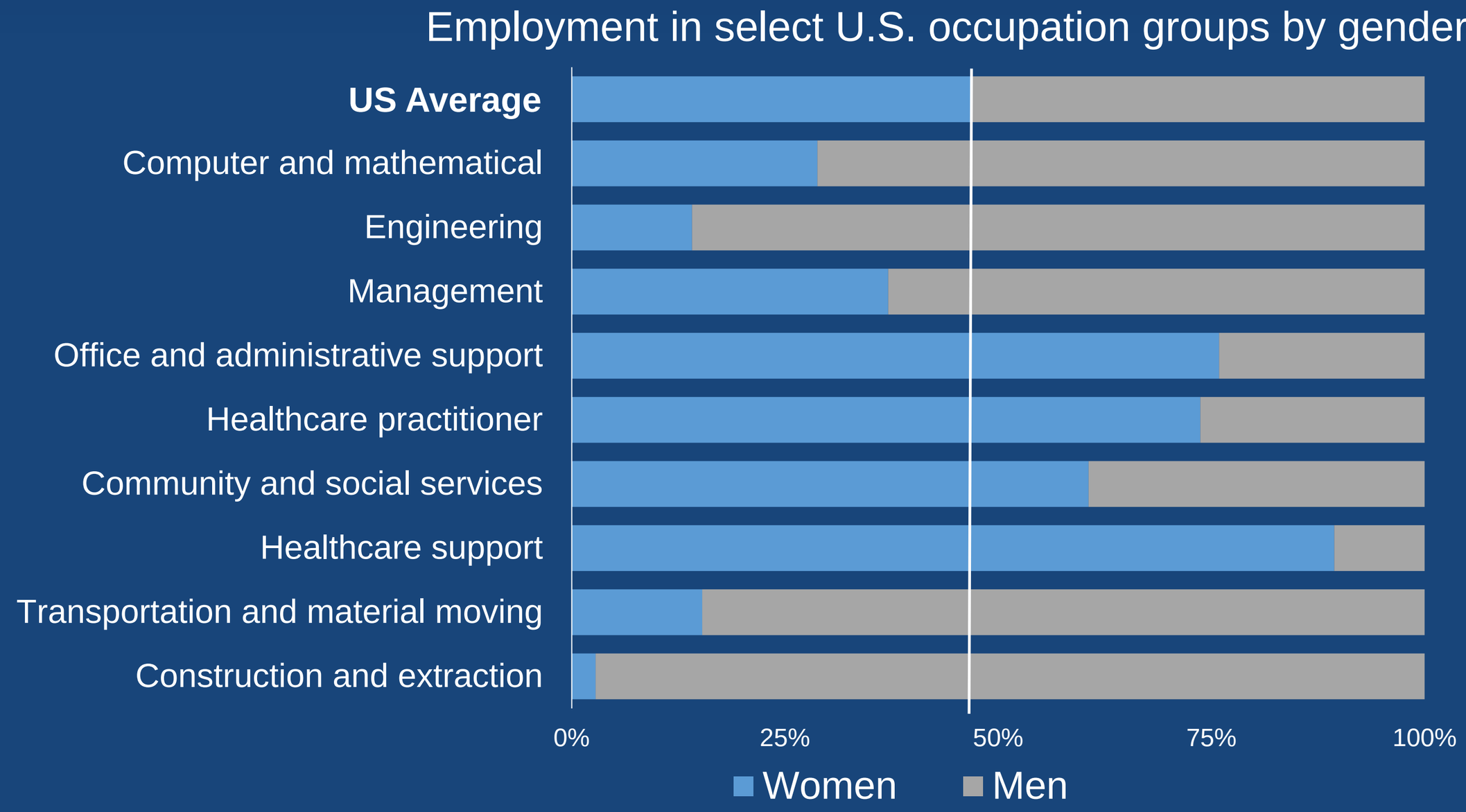
LATINO
40



Women remain underrepresented in highly digital occupations

Higher digital score

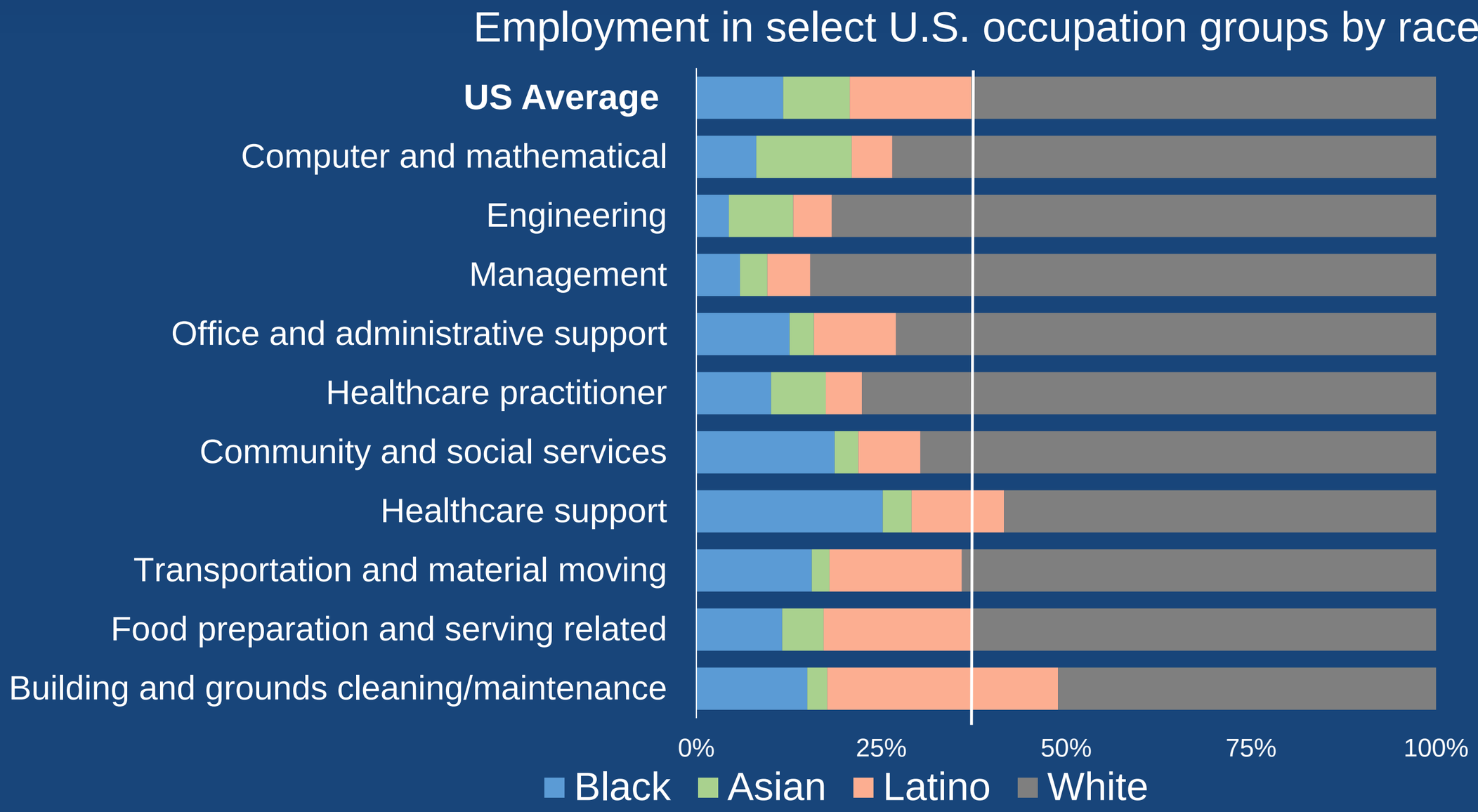
Lower digital score



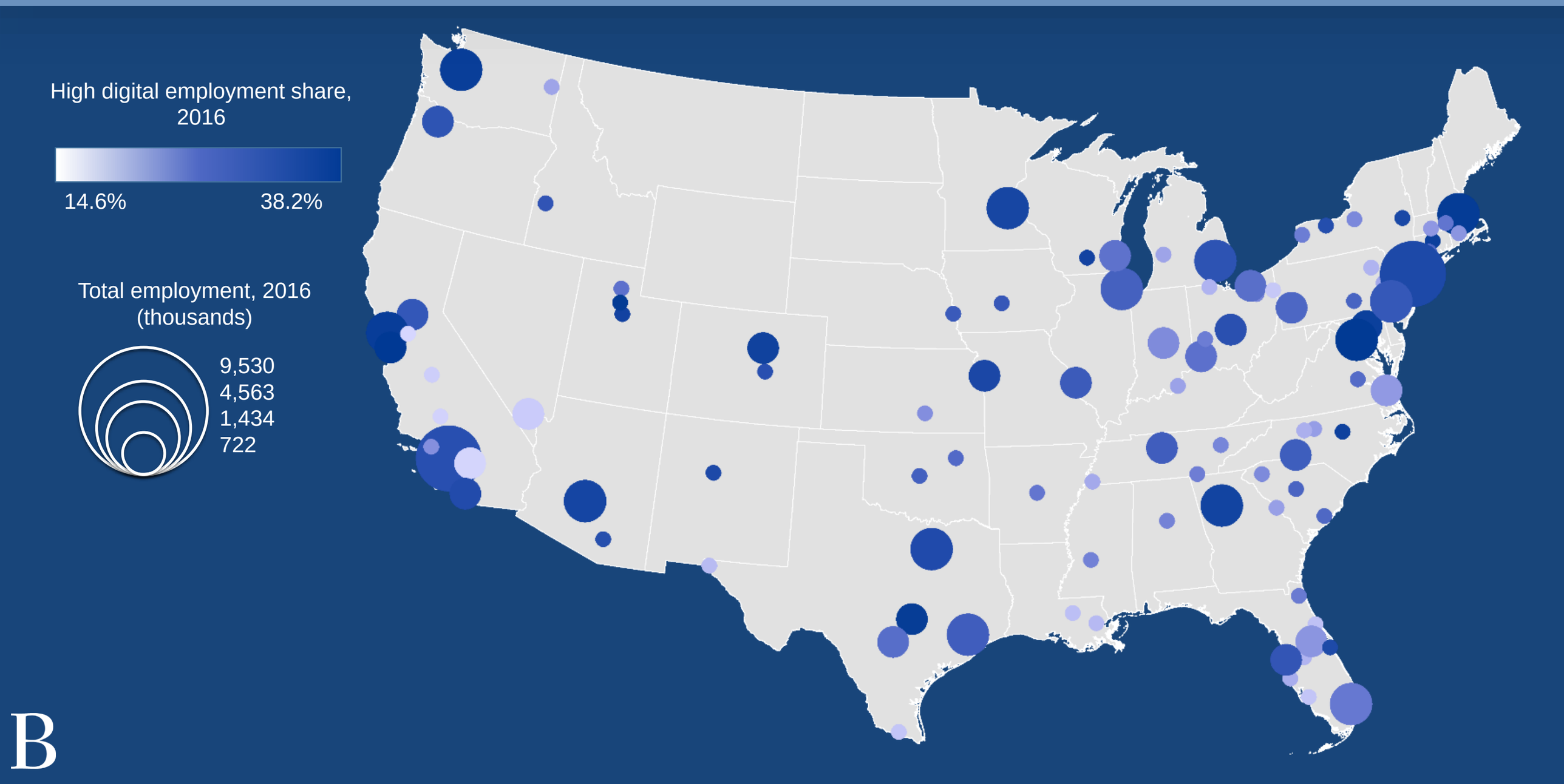
Non-whites are disproportionately employed in low-digital skill jobs

Higher digital score

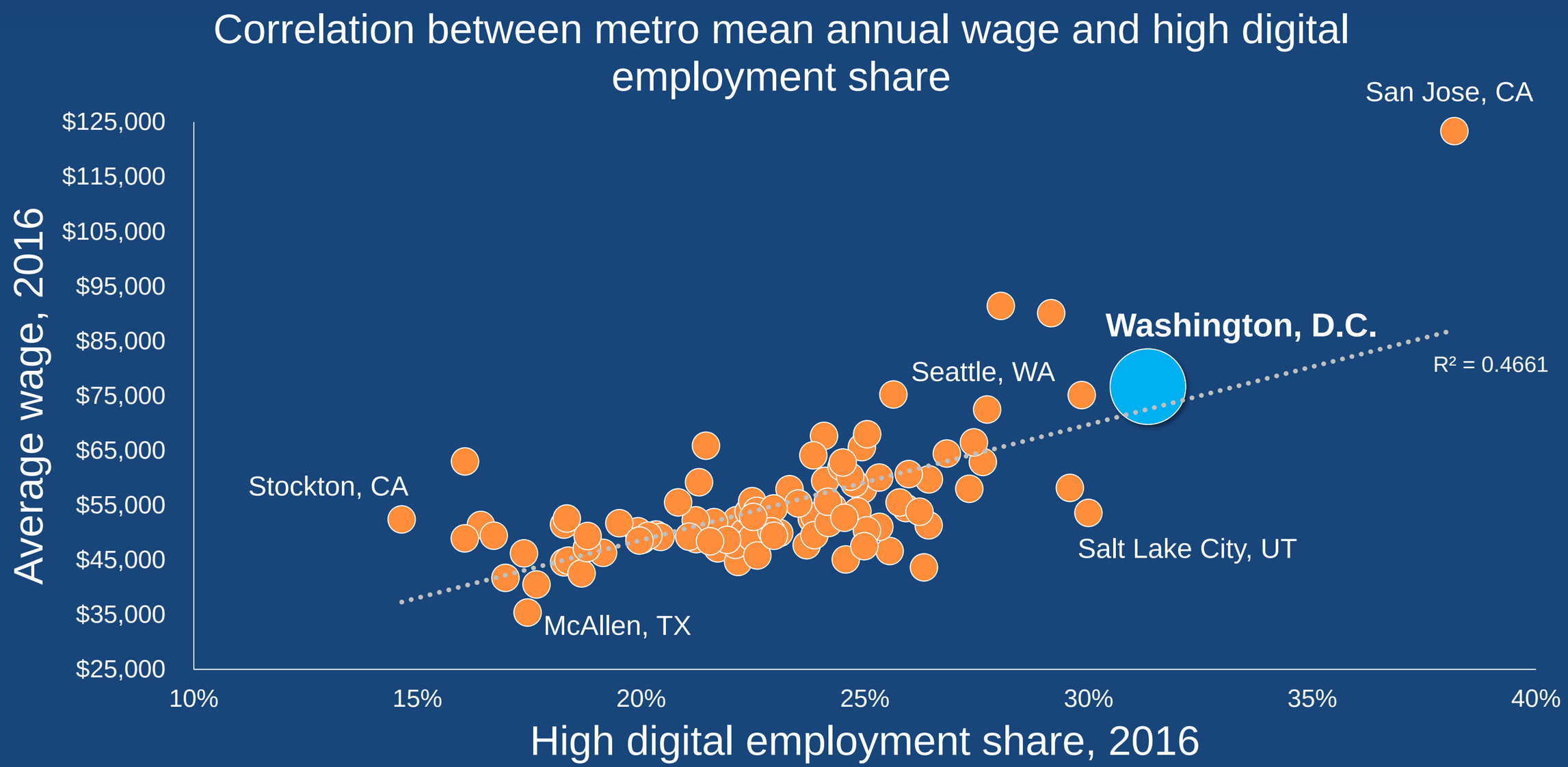
Lower digital score



Digitalization levels vary across U.S. metros



Higher metro digitalization is strongly correlated with higher wages



1 Digitalization: What it is; why it matters

2 A new analysis and national trends

3 Implications for cities

The DMV is a digitalization hub

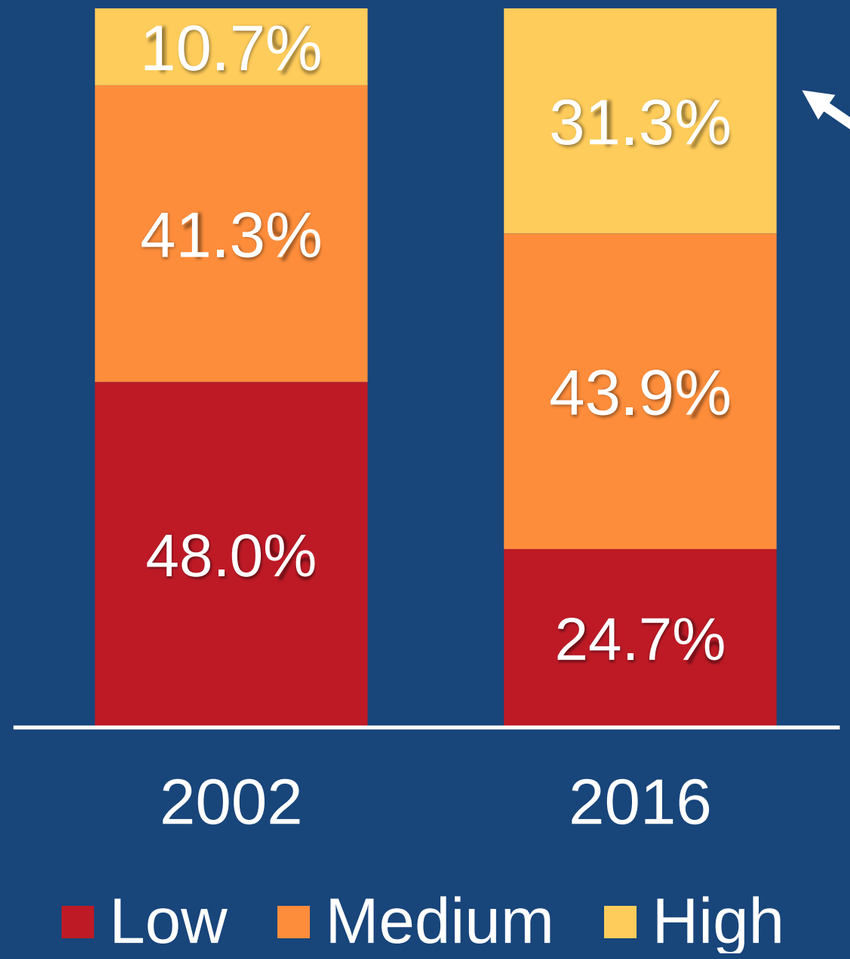
31%

High digital job share in Washington, D.C. MSA

2nd

Highest among the largest 100 U.S. metros

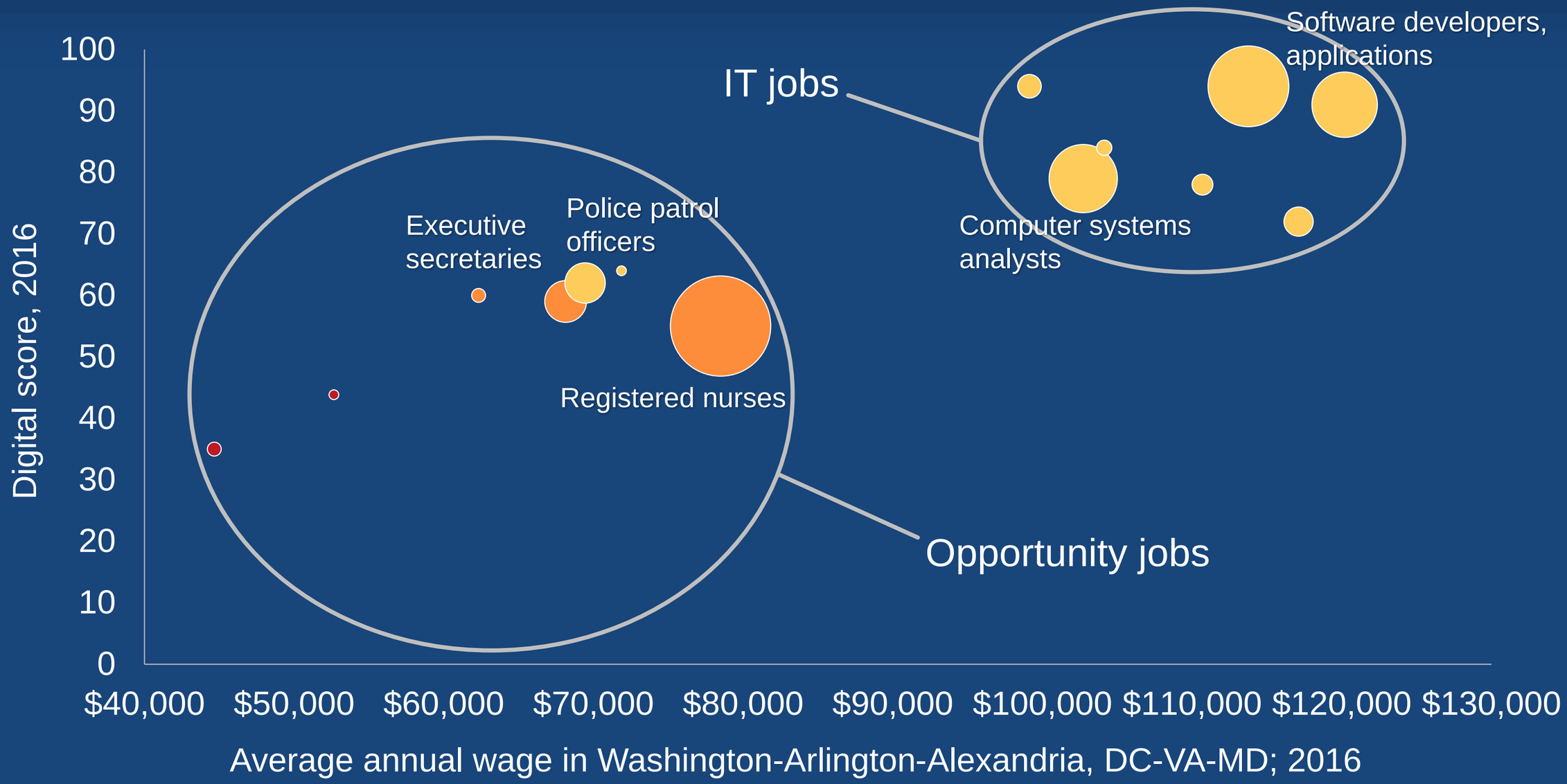
Employment in Washington, D.C. MSA by digital skill level



656,000

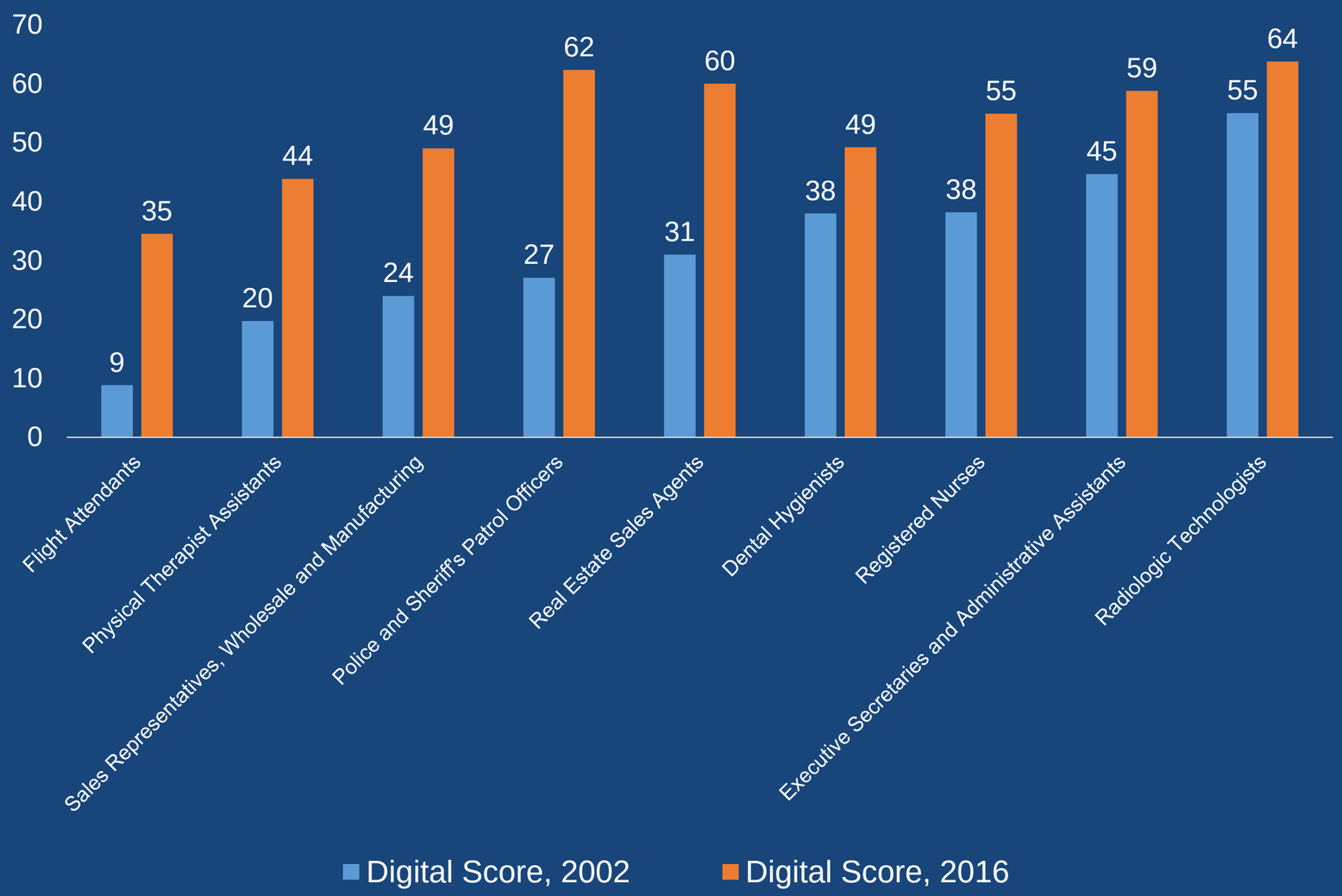
High digital jobs in 2016

DMV digitalization scores highlight two distinct issues

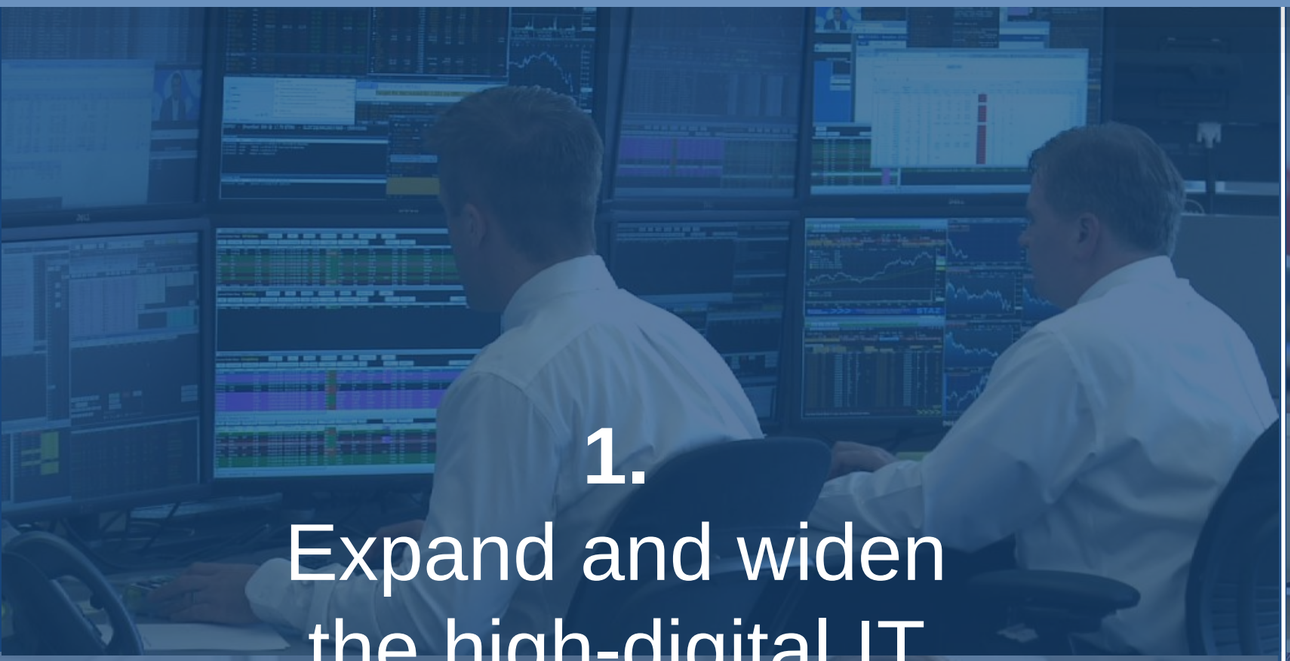


Note: Bubble size reflects employment in Washington-Arlington-Alexandria, DC-VA-MD in 2016; "Opportunity jobs" are occupations that do not require a bachelor degree but paid higher than the national mean annual wage in 2016

Key fact: On-ramps to middle-class careers are rapidly upskilling

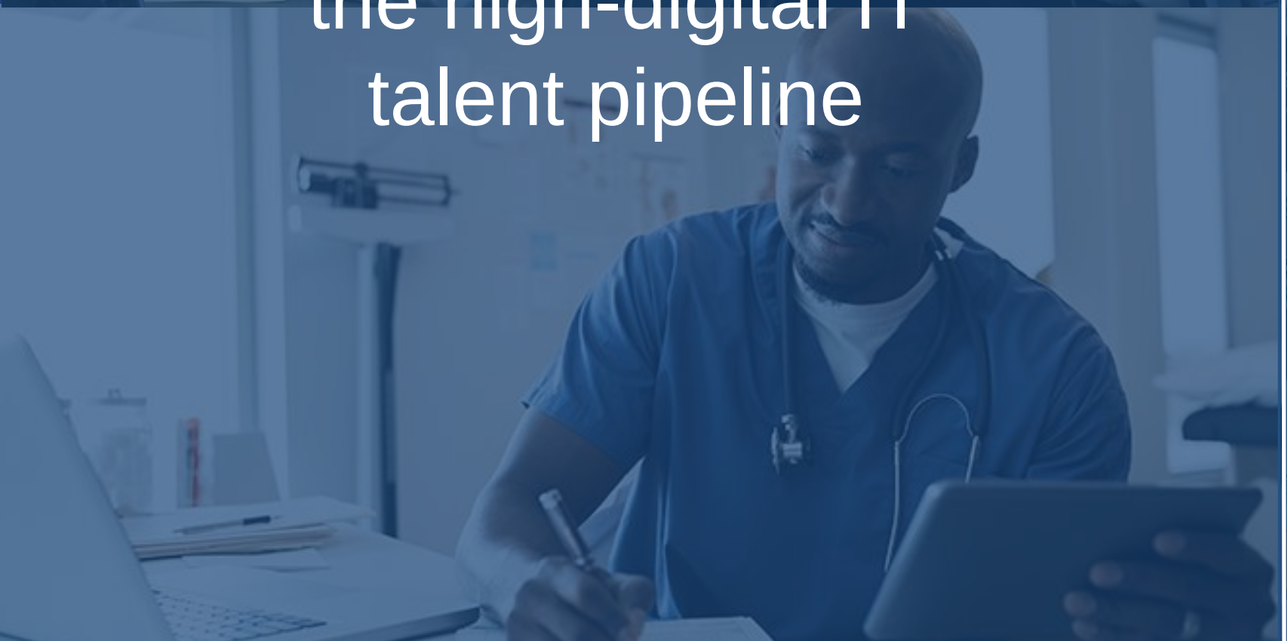


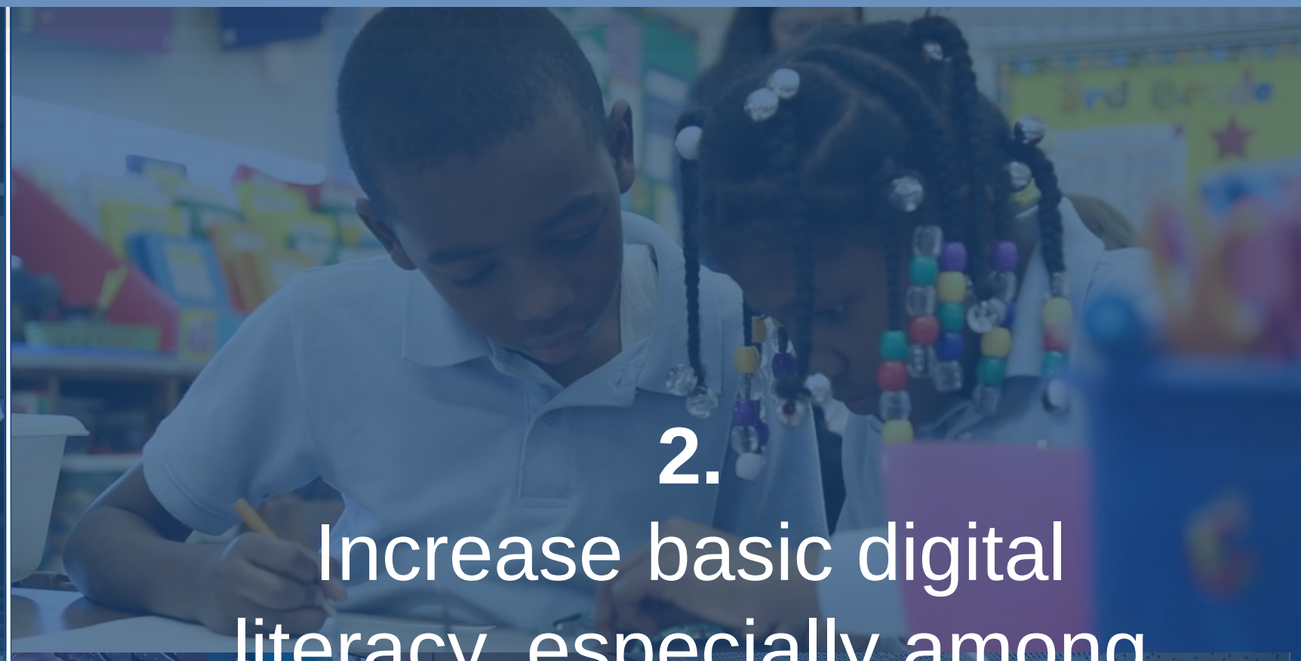
The region should adopt two digital workforce training priorities



1.

Expand and widen the high-digital IT talent pipeline

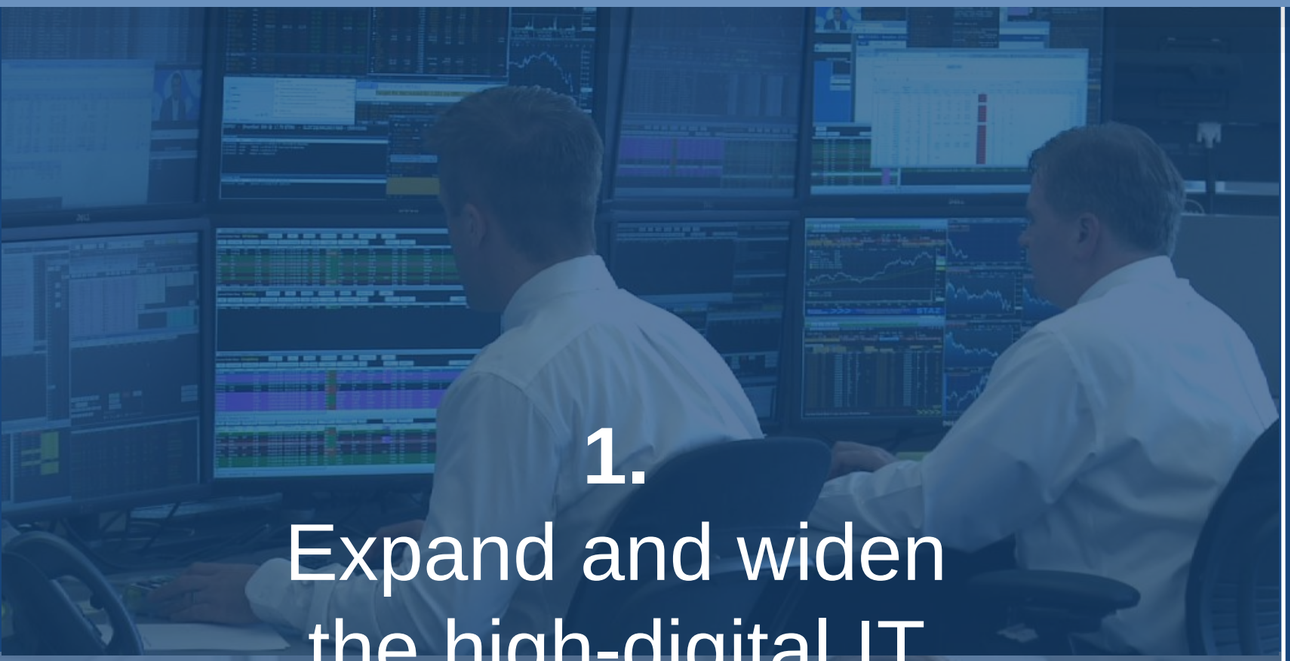


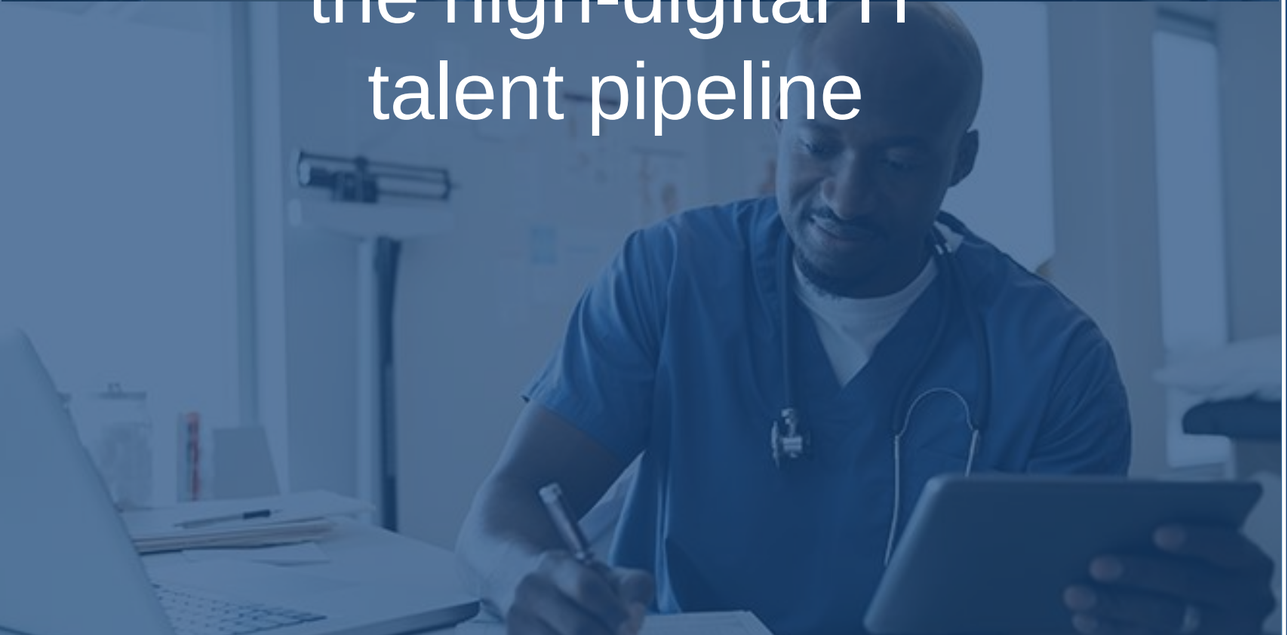


2.

Increase basic digital literacy, especially among underrepresented groups

The region should adopt two digital workforce training priorities





1.
Expand and widen the high-digital IT talent pipeline

- Expand aligned, relevant higher-ed feeder programs
- Scale up non-traditional accelerated learning models, experiences, and certifications
- Move toward universal K-12 CS exposure

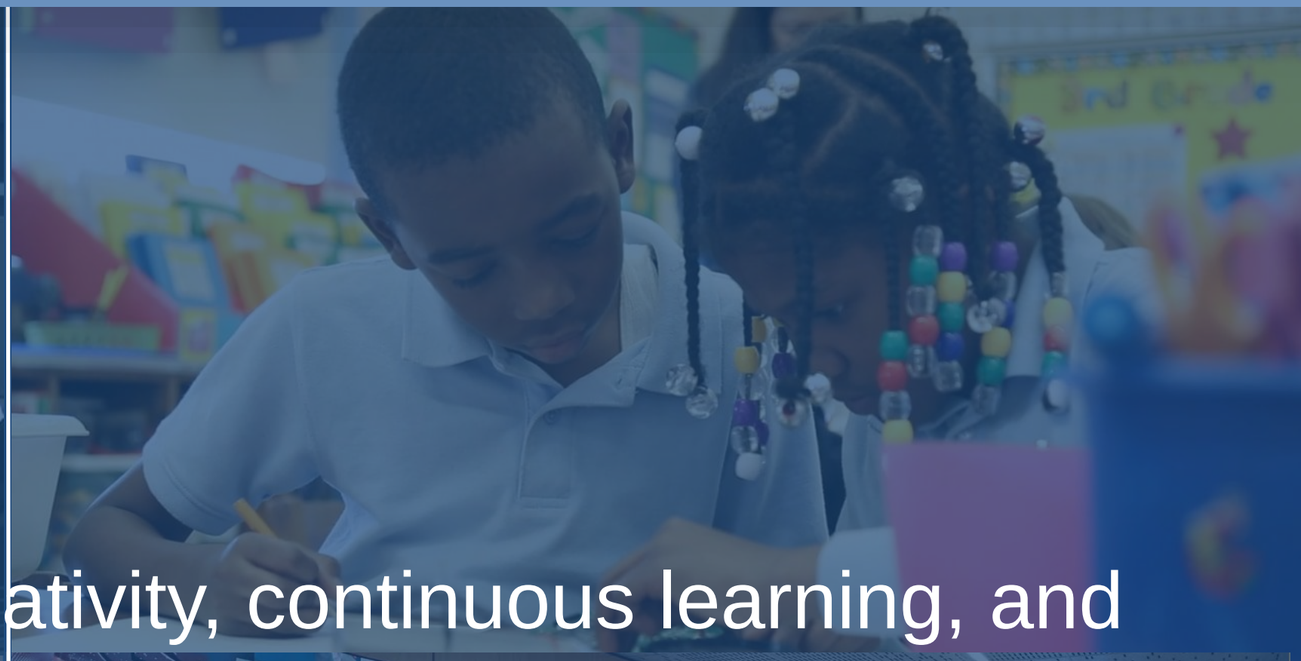
The region should adopt two digital workforce training priorities

2.

Increase basic digital literacy, especially among underrepresented groups

- Launch compelling digital literacy campaigns
- Scale-up exposure to basic office productivity tools in school
- Expand entry-level tech training programs

Finally: Cultivate what is “uniquely human”



Emphasize adaptability, creativity, continuous learning, and social skills over rote information processing

For more information:

Mark Muro
Senior Fellow
Metropolitan Policy Program at Brookings
mmuro@brookings.edu

@markmuro1

Digitalization

and the New Workforce Imperatives

Mark Muro
Brookings Metropolitan Policy Program
@MarkMuro1

Report Release Event
December 7, 2017