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TECHNOLOGY, PRODUCTIVITY AND WORK: IMPLICATIONS FOR INCLUSIVE GROWTH

MCKINSEY GLOBAL INSTITUTE

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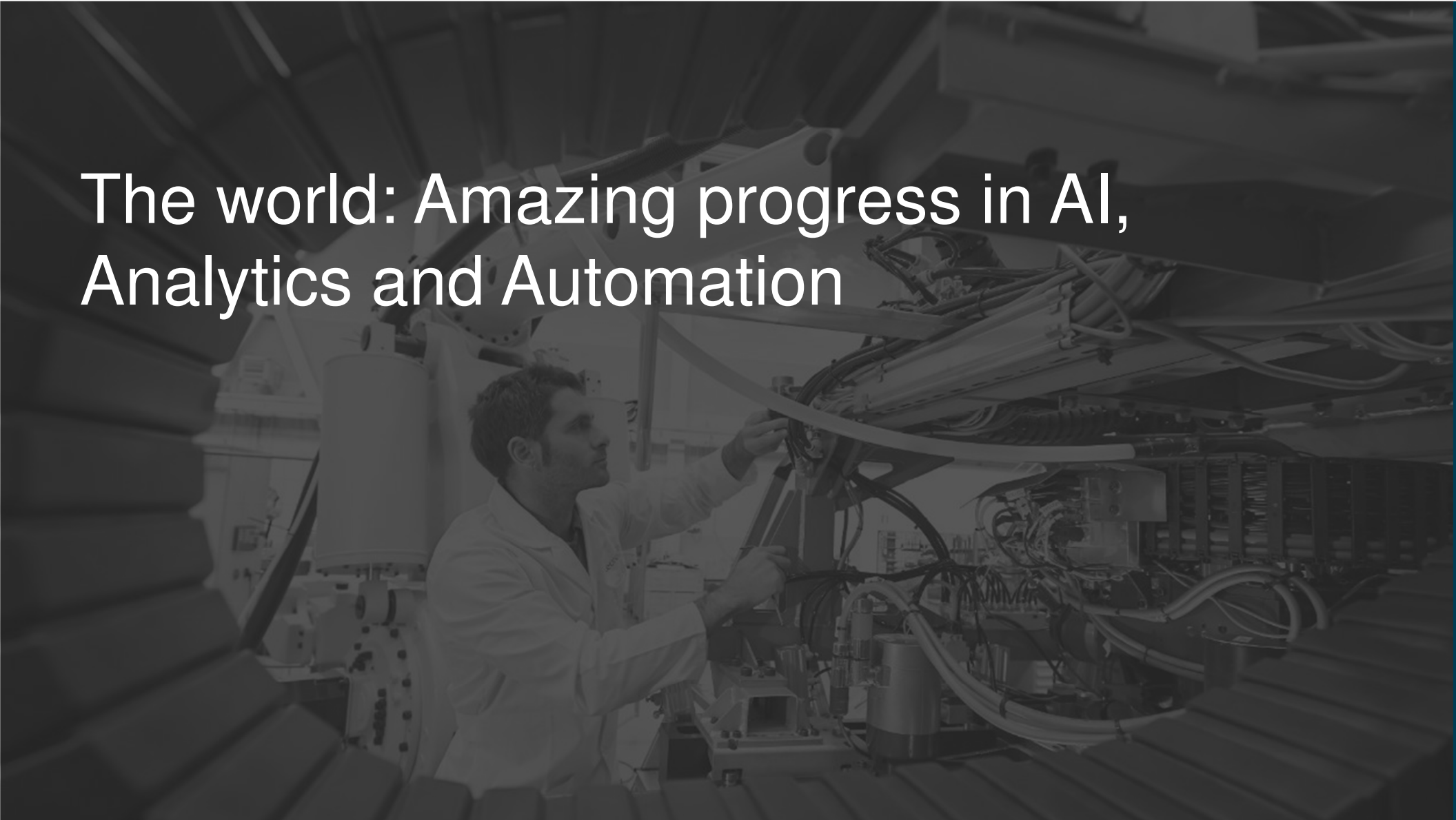
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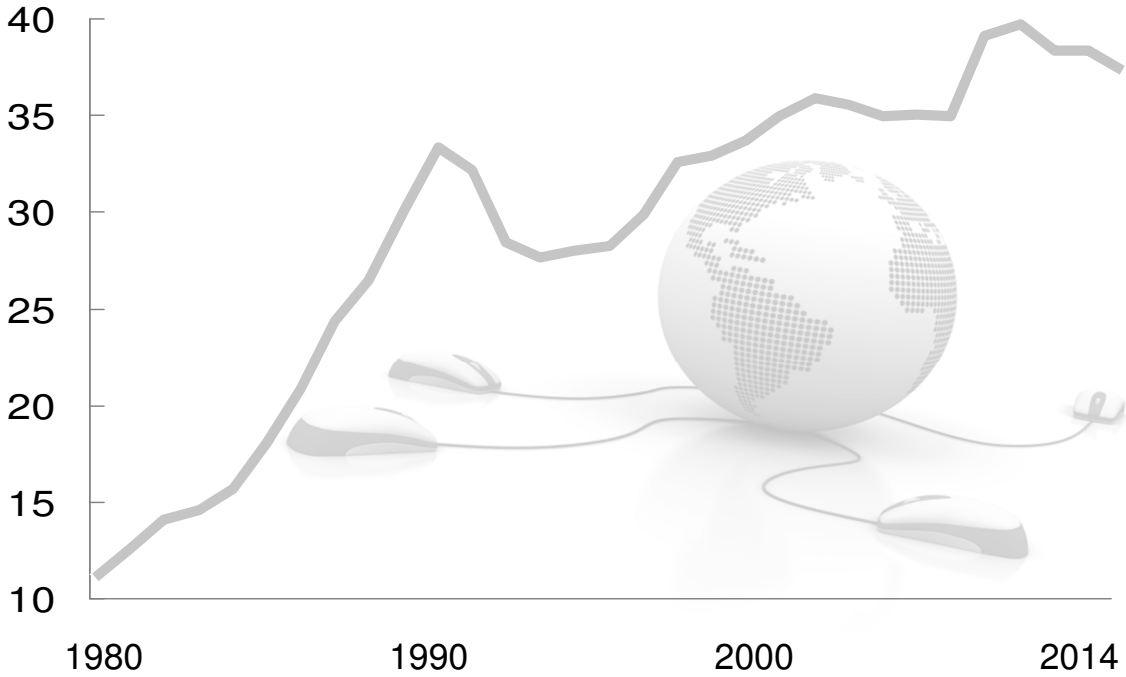
The world: Amazing progress in AI, Analytics and Automation



Technology is now a dominant factor in investment

Growing technology intensity of business

Tech spend¹ as percent of U.S. capital investment (nominal) (%)



\$6 trillion

cumulative tech capital investment globally

3x

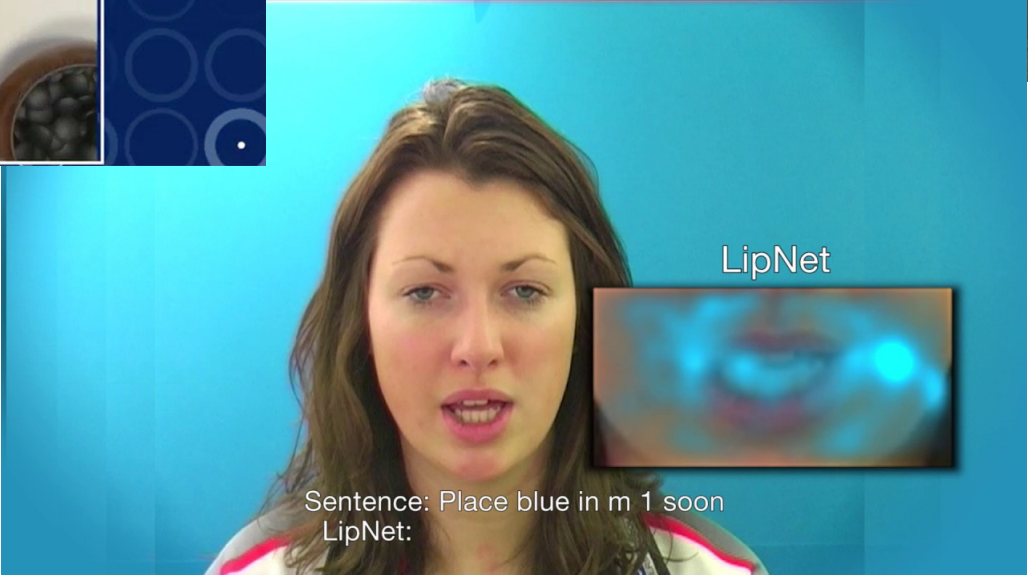
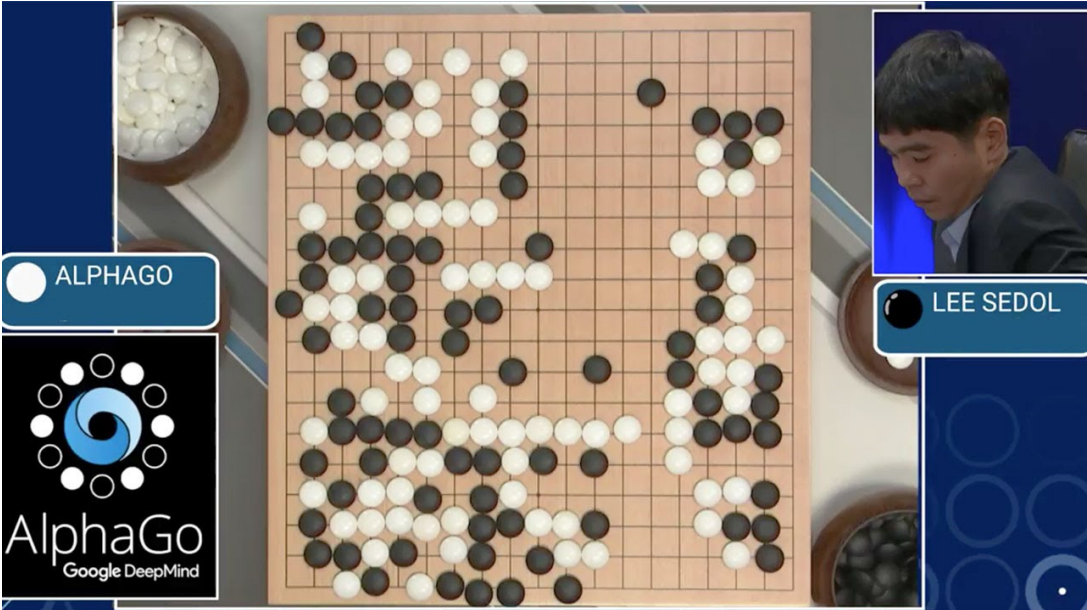
Increase in technology intensity of capex

Return on Technology Investment

a critical metric for enterprise performance

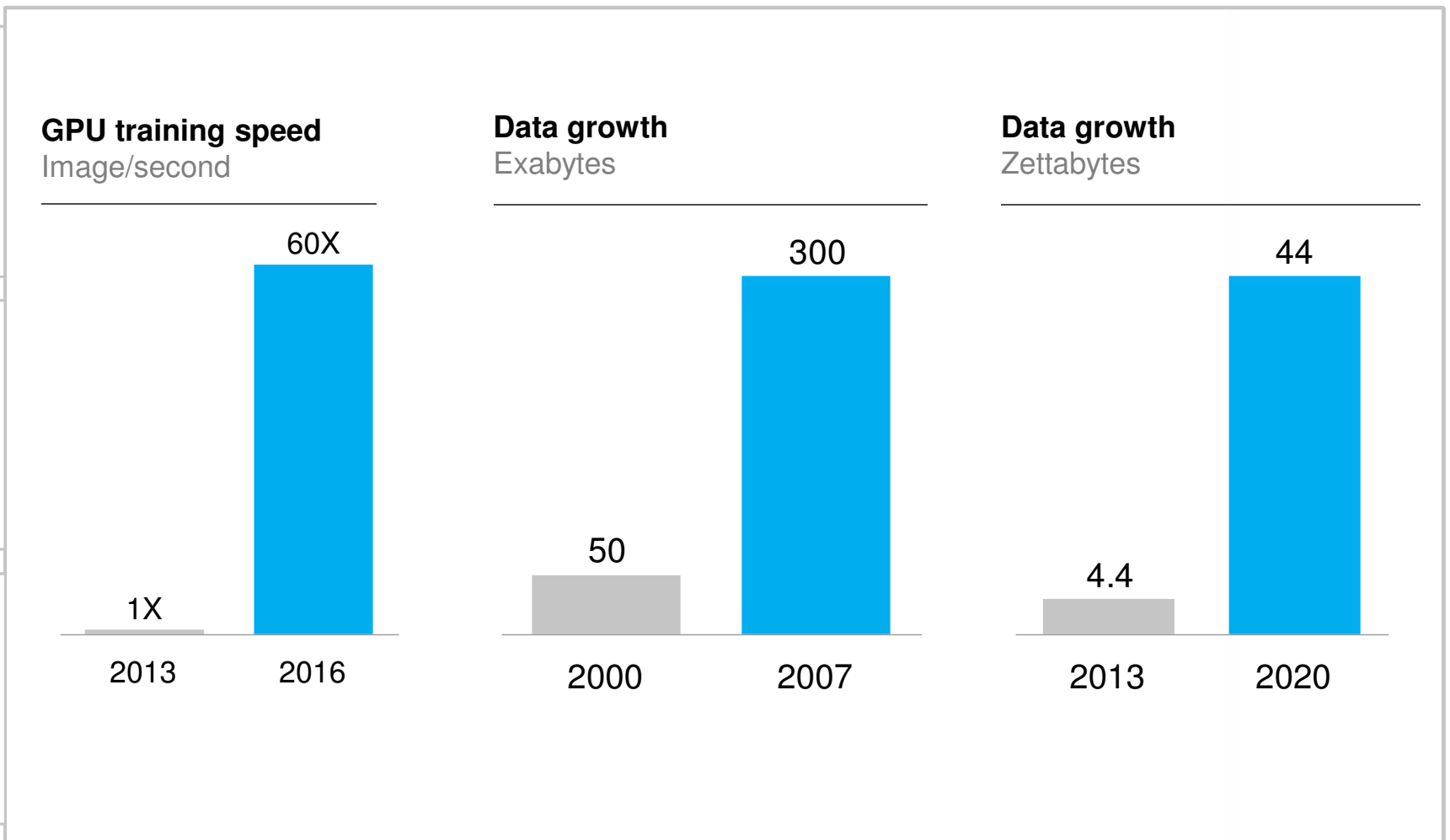
¹ Includes hi-tech services, ICT investments, software and service investments, computers and related HW
SOURCE: Bureau of Economic Analysis; McKinsey Global Institute; team analysis

Amazing progress on automation, artificial intelligence and analytics

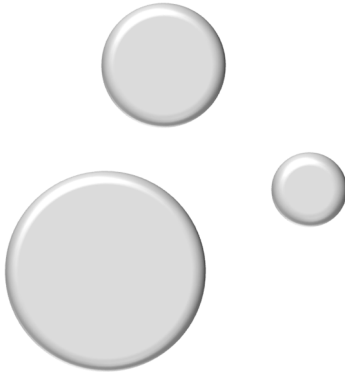
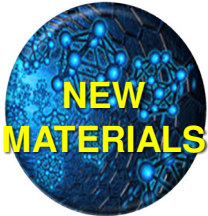


Why now?

- Algorithms
- Compute
- Data



Good for society – and good for business

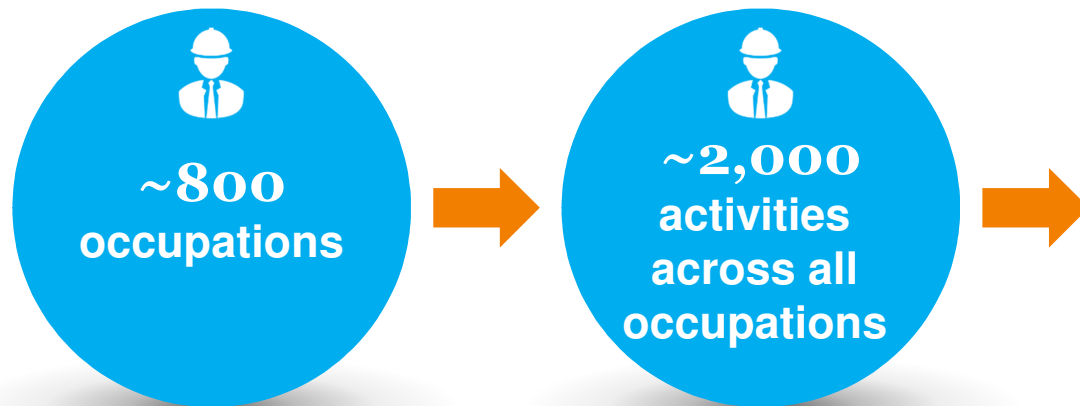


Implications for jobs and work



XX Top quartile automation
XX Below median automation

The impact on workers depends on the capabilities of currently proven technologies



Capability requirements

Social

- Social and emotional sensing
- Social and emotional reasoning

Cognitive

- Natural language
- **Recognizing known patterns/categories**
- **Generating novel patterns/categories**
- **Logical reasoning/problem solving**
- **Information retrieval**
- **Optimizing and planning**
- **Creativity**
- Coordination with multiple agents

Physical

- Sensory perception
- Fine motor skills/dexterity
- **Gross motor skills**
- **Navigation**
- **Mobility**

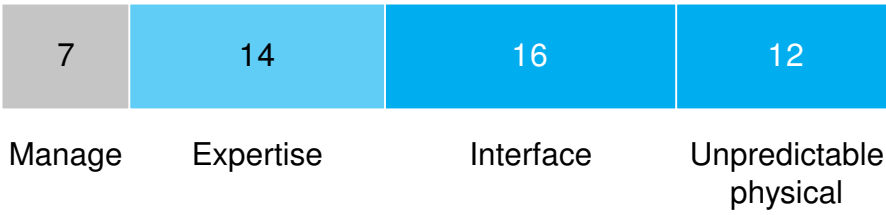
Some activities have high technical automation potential

BASED ON DEMONSTRATED TECHNOLOGY

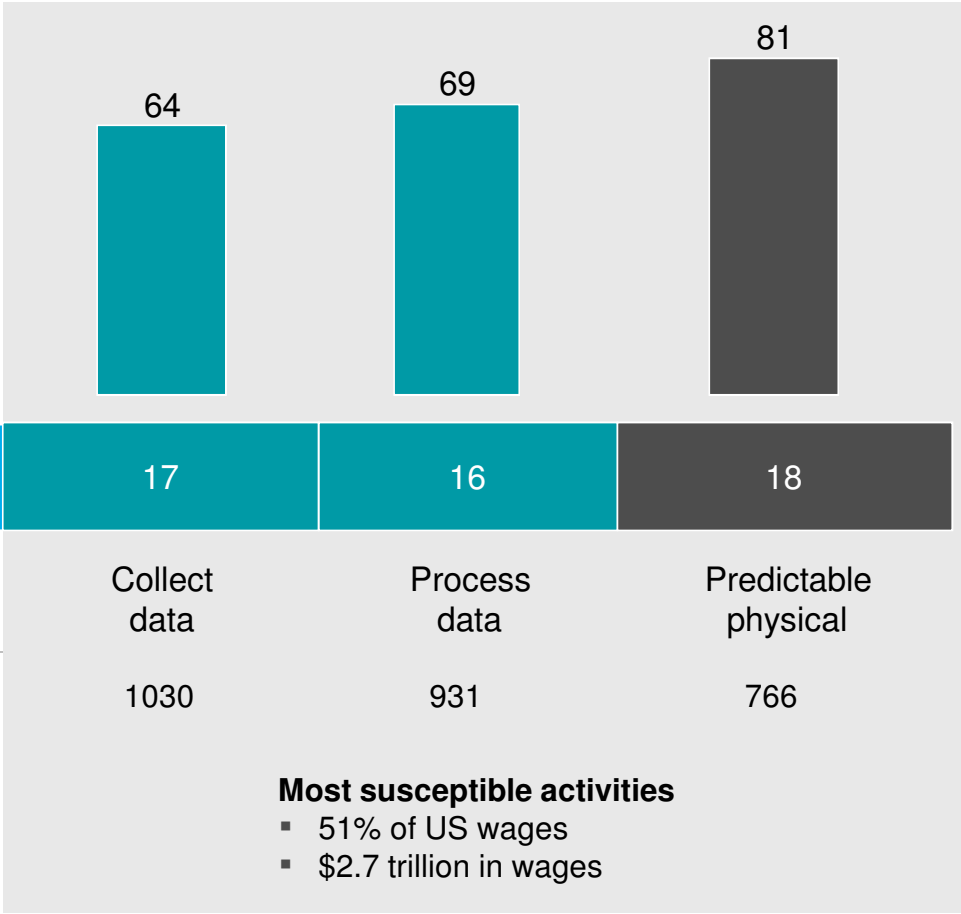
Time spent on activities that can be automated by adapting currently demonstrated technology %



Time spent in all US occupations %



Total wages in US, 2014 \$ billion



1 Managing and developing people.
 2 Applying expertise to decision making, planning, and creative tasks.
 3 Interfacing with stakeholders.

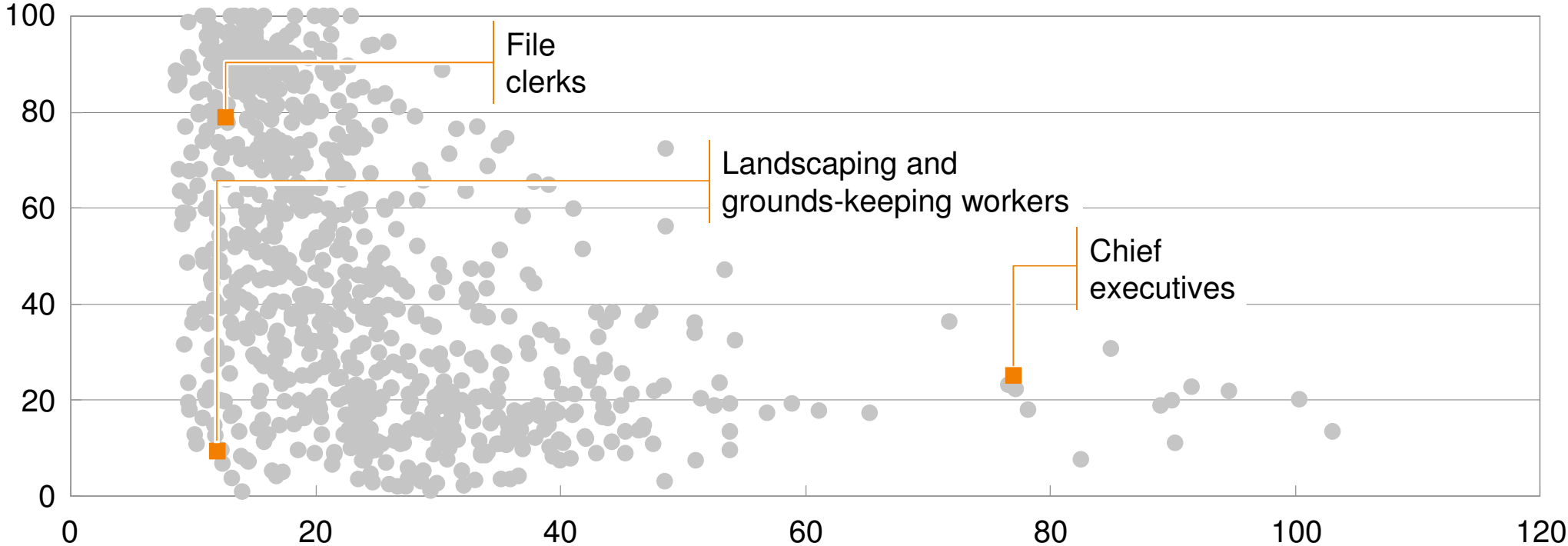
4 Performing physical activities and operating machinery in unpredictable environments.
 5 Performing physical activities and operating machinery in predictable environments.

Automation impacts both high and low wage occupations

BASED ON DEMONSTRATED TECHNOLOGY

Ability to technically automate

Percentage of time on activities that can be automated by adapting currently demonstrated technology



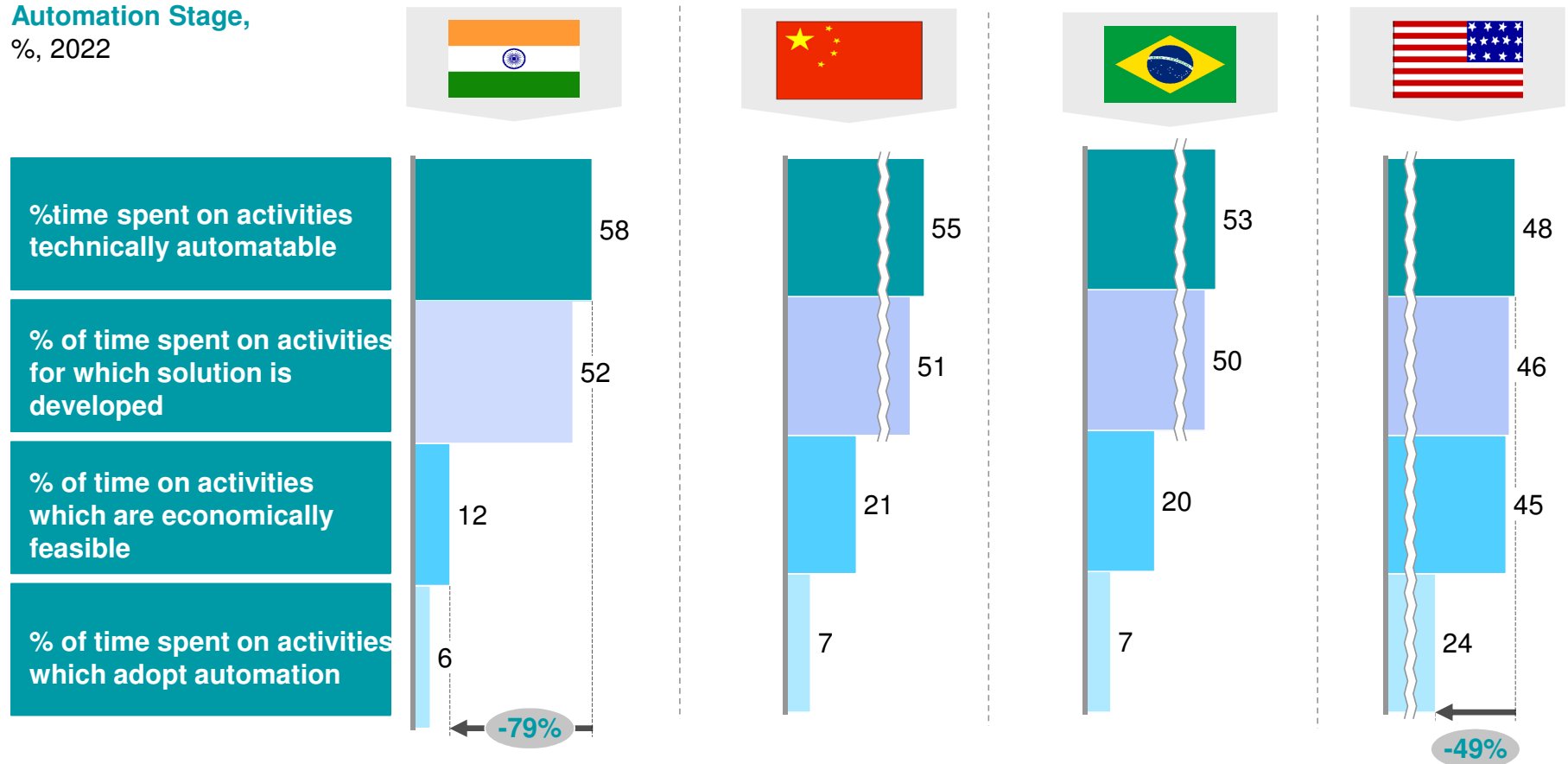
Hourly wage
\$ per hour

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
2 Using a linear model, we find the correlation between wages and automatability in the US economy to be significant (p-value <0.01), but with a high degree of variability ($r^2 = 0.19$)

SOURCE: O*Net 2014 database; McKinsey analysis

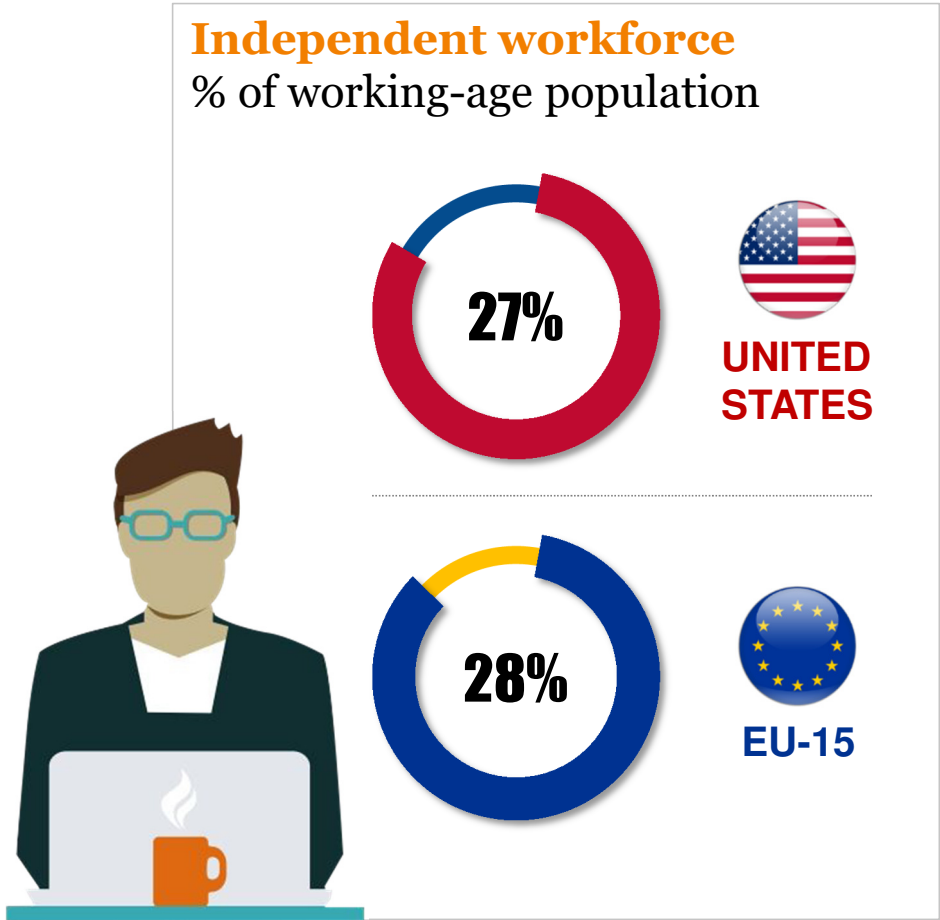
Developing countries have high work-automation potential but adoption may remain muted due to lower economic feasibility in the near term

Automation Stage,
%, 2022



SOURCE: Source

Meanwhile, more and more people want to work on their own terms
 % of independent workforce in each country, based on MGI survey



Key areas of higher satisfaction¹

70% of independent workers are “by choice”

They report higher overall satisfaction with their work lives than traditional workers


Work topic	
Independence	
Hours worked	
Creativity	
Flexible hours	
Income level	

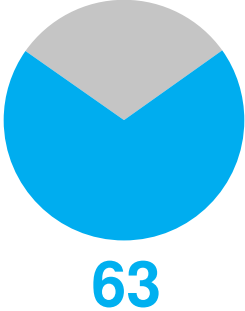
¹ Areas where satisfaction higher for “by choice” independent workers than traditional workers

SOURCE: McKinsey Global Institute survey


Independent workers are starting to use digital platforms to access work
Based on MGI survey

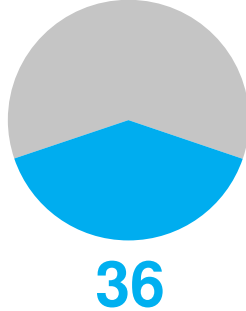
SHARE THAT HAVE USED DIGITAL PLATFORMS

Workers who sell goods 




Etsy ebay™

Workers who lease assets 



 Getaround 
 NATRAJINI

Workers who provide labor 



 FREELANCE™ PHYSICIAN 
 upwork™ formerly oDesk **UBER**

SOURCE: McKinsey Global Institute survey

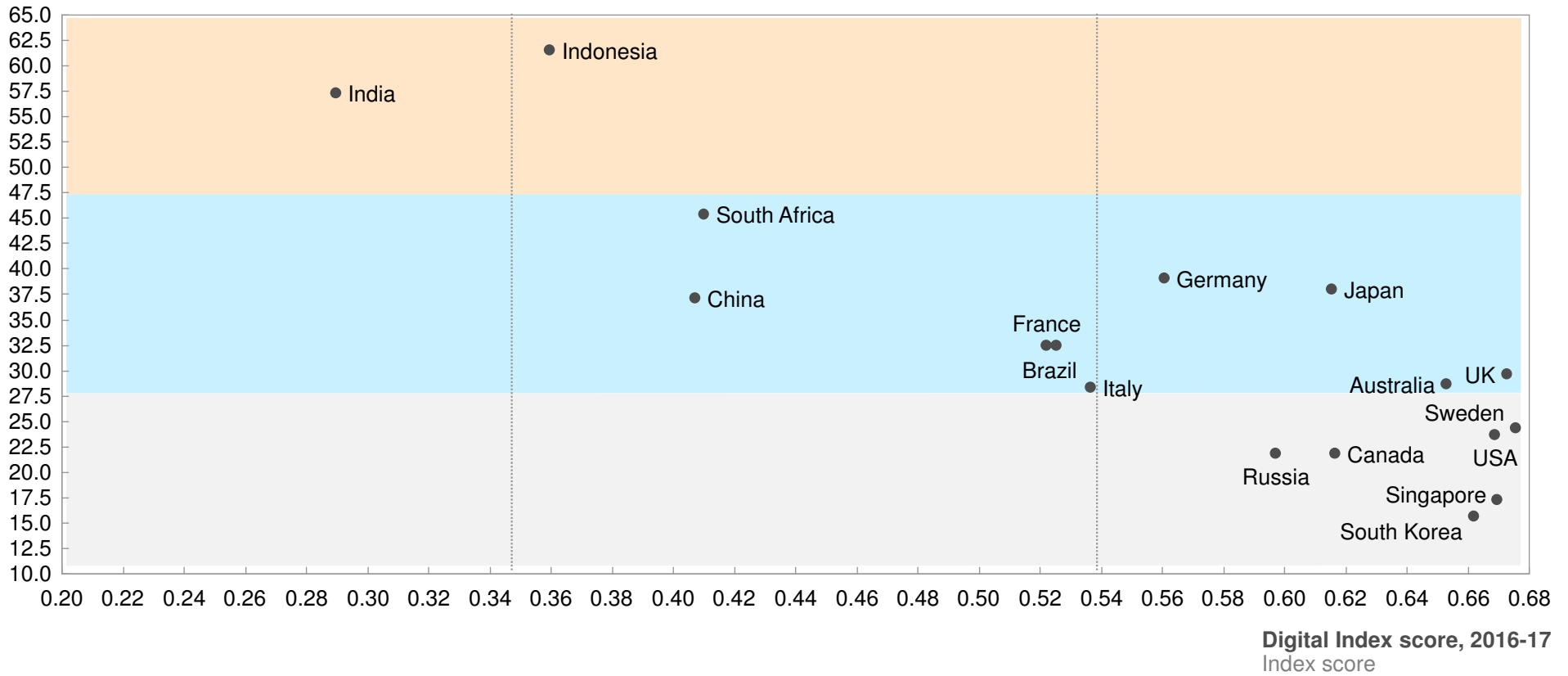
Implications for inclusive growth



Many developing economies are in a steeply accelerating phase of digital adoption

Digital Index growth, 2013-16
Percent

Low momentum Medium momentum High momentum




SOURCE: McKinsey Global Institute analysis


Example: Explosive digital adoption in India triggered by both private sector and government

Private sector action

 **422 million**
number of internet subscribers


 **190 million**
number of social media users


 **160 million**
number of Whatsapp subscribers


 **39 million**
number of e-commerce users

Government action

 **1.1 billion**
number of people with unique digital identities (Aadhaar)

 **400 million**
Aadhaar-linked bank accounts

 **5.8 billion**
number of digital payment transactions each year (wallets, net banking, credit/debit card at POS)

 **250,000**
number of Common Service Centres providing e-services

Example of welfare boost: Primary health care system that overcomes the lack of doctors

Low cost tablets for door-to-door household screening of villagers

Geotagging and barcoded unique identity for all patients

Cloud-based Health Information System for electronic health records and monitoring

Low cost diagnostics at central labs with online reports

Smart App for risk assessment and protocol-based treatment

Online drug prescription, stocking and scheduling follow ups



Run by community extension workers with 8-12 weeks of training; treating 100,000 patients in rural Tamil Nadu

Example of productivity boost: Low-cost quality education through digitisation

Cashless schools (fees, payments)

E-administration (admissions, testing, record-keeping)

E-teaching apps for teachers (scripted lessons, online grades)

Smartphone-based teacher attendance monitoring

Online assessment system and monthly data sent to head office

24x7 call center for pupils, parents, staff



Reading and math scores 30-100% higher than peer schools - 300 schools at \$5/month in Kenya

Example of labour market boost: Opportunities for informal service providers to find work

Works on a free “Missed Call” by the jobseeker to the portal

Web, voice and SMS text-based for ease of interface with less-educated job-seekers

Filtering, tracking, rating of opportunities and candidates possible

Reputation-discovery possible over time to enhance job prospects

Digital payment and transaction trail

Cost of \$0.5 per day

बेहतर नौकरी आपकी मुट्ठी में!

बाबाजॉब से मिलेगी आपको बेहतर नौकरी।

उपलब्ध नौकरियां

नौकरानी	वाहन चालक	रिसेप्शनिस्ट
बावर्ची	प्रबंधक	व्यवस्थापक
सहायक	बिक्री	केशियर
पहरेदार	डेटा प्रवर्ति	
गृह व्यवस्था	बीपीओ	और बहुत सारे ...

₹1 प्रति दिन से भी कम!

हम आपको कॉल कर के आपकी प्रोफाइल बनायेंगे

रोजाना नौकरी की सूचना!

नवसिखुआ और अनुभवहीन (दोनों) उम्मीदवार रजिस्टर कर सकते हैं

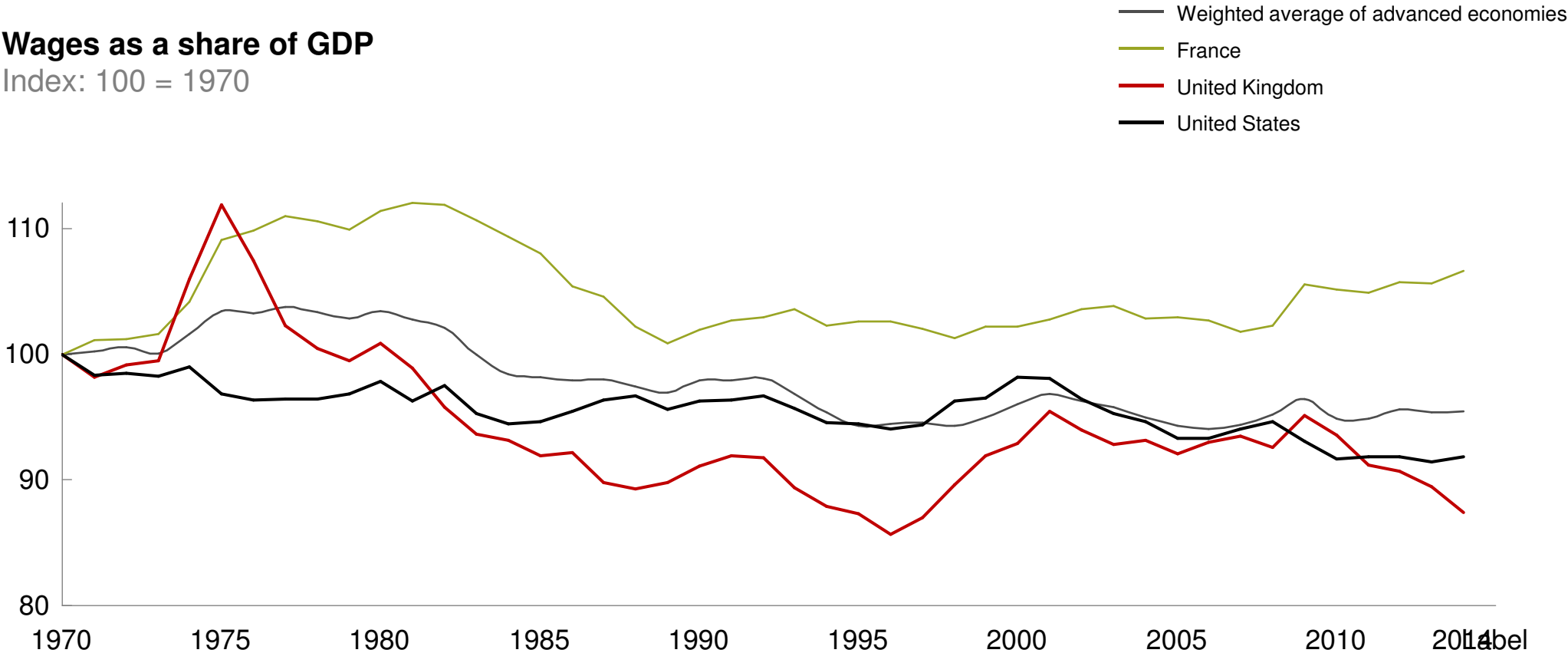
- 30 रुपये का शुल्क जमा करें और एक प्रोफाइल बनाएं
- आपको बाबाजॉब से फोन आएगा और आपकी जानकारी को हमें दे देंगे
- बाबाजॉब आपको नौकरी के बारे में सूचना देगा
- निवेशक को कॉल करें, इंटरव्यू / मीटिंग और नौकरी प्राप्त करें

Main occupations: cooks, maids, security guards, office helpers - 500,000 jobseekers, 60,000 employers

Globally, the link between economic growth and wage growth is weakening

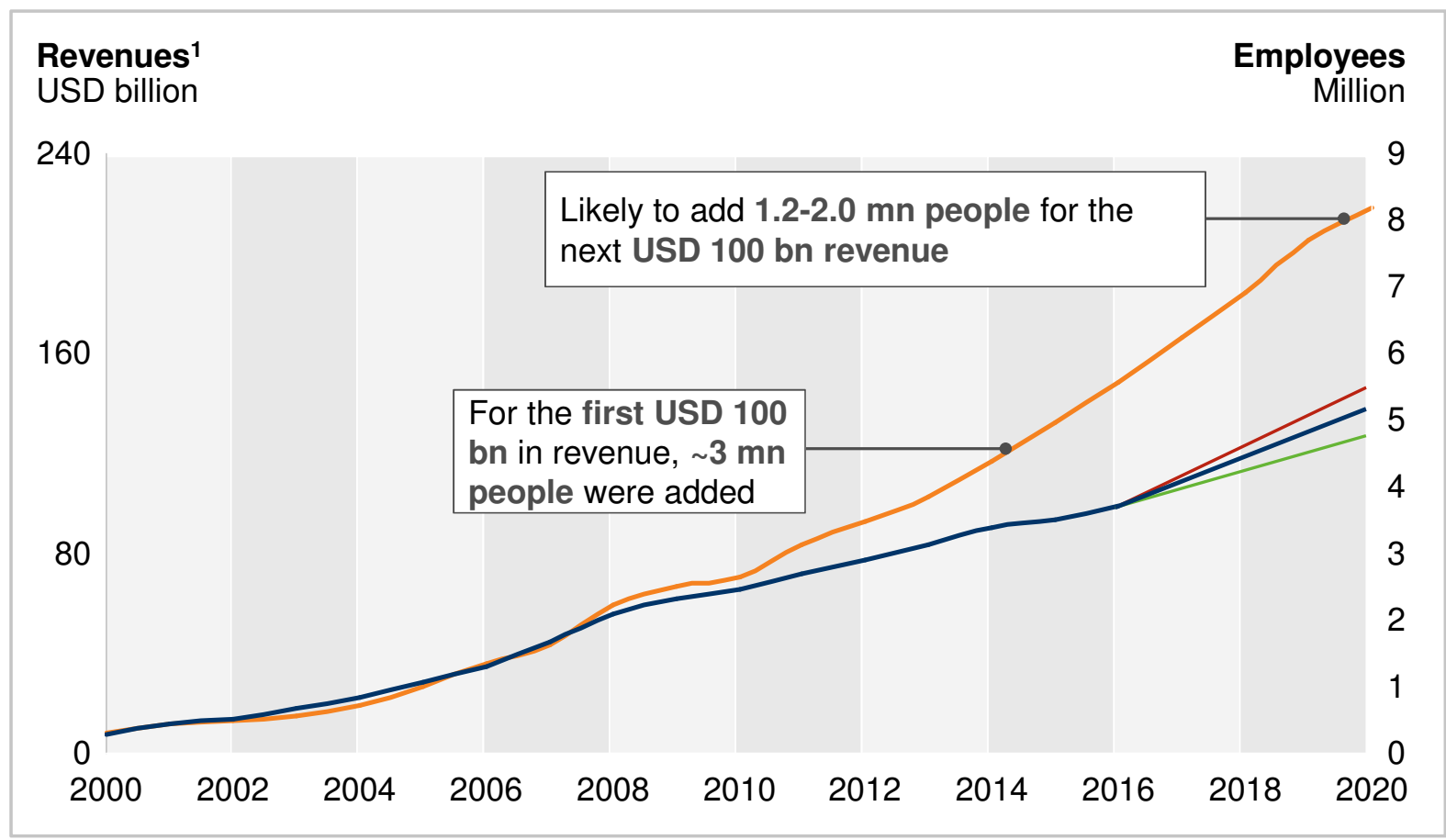
Wages as a share of GDP

Index: 100 = 1970



The creation of well-paying jobs will become more challenging

- Revenues (USD billion)
- Employees (million)
- Base case
- High case
- Low case



¹ India's IT services industry revenues
SOURCE: NASSCOM; ICRIER; McKinsey analysis

To capture the opportunity and navigate the challenges - there is work for everyone



Companies

- Embrace technology and automation to capture the benefits
- Create jobs and reshape jobs the enable people to work with machines
- Play role in redeploying labor through retraining and skill-raising programs



Policymakers

- Support development and deployment of technologies in a competitive manner
- Use technology to promote efficiency and creation of public goods
- Promote measures to raise skills and job creation but rethink incomes and social safety nets



Individuals

- Focus on acquiring skills throughout lifetime
- Make education and career choices, based on skills that will still be in demand in an automation world



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