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The 4th industrial revolution – and the need to rethink development models

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- There is significant economic and business upside at stake
- Businesses and governments will need to consider key disruptions
- A rising superstar effect
- New business strategies
- Large skill shifts and the future of work
- More digital flows, less labor cost arbitrage

Fundamental technological changes ahead



Starting from a low base, developing economies are beginning to close the gap through rapid adoption of new technologies

Country Digital Adoption Index, Score (0-100), 2017 % growth, 2014-17 South Korea 75 Sweden 73 United Kingdom 67 67 Singapore **United States** 66 Australia 66 65 Canada Russia 64 64 Japan 61 Germany France 58 57 Italy Brazil 50 China 47 Indonesia 40 South Africa 40 India 32

Growth in Country Digital Adoption Index,

Indonesia	
India	
China	45
Russia	44
Germany	44
Japan	43
Italy	36
South Africa	35
France	35
South Korea	31
United Kingdom	30
Brazil	30
United States	30
Sweden	27
Canada	25
Australia	25
Singapore	24

99

90

In many developing countries, the price of data is no longer a constraint on digital adoption

Data price



Per GB of data (% of monthly GDP per capita)

SOURCE: Analysis Mason, January 9, 2019; UN Database; Digital India; McKinsey Global Institute analysis

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The same sectors tend to be at the frontier – and lagging behind – in the United States, Europe, and China



1 Index is based only on asset and labour components and thus may not align with heat maps displayed elsewhere

2 Due to accounting differences between the United States and Europe, not all sectors can be fairly compared

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Globally, automation could become a significant economic growth engine as employment growth wanes

GDP growth for G19 and Nigeria



SOURCE: The Conference Board Total Economy database; United Nations Population Division; McKinsey Global Institute analysis

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Firms that lead on digitisation perform better according to key financial metrics



 1 Digital leaders, emerging leaders, and digital laggards defined based on Digital QuotientTM material. Here, digital laggards are companies with DQTM scores <30 (<25 in DQTM materials), emerging leaders have DQTM scores of 30-55 (25-50 in DQTM materials), and digital leaders have DQTM scores of >55 (>50 in DQTM materials)

 2 Operating profit margin for selected sectors as a share of turnover, for continuing operations and before exceptional items

SOURCE: McKinsey Digital Quotient analysis of 46 publicly traded companies; McKinsey Global Institute analysis, McKinsey Global Institute, Digital Europe: Pushing the frontier, capturing the benefits, June 2016; McKinsey Global Institute, AI: The next digital frontier? June 2017

AI creates more value compared to traditional analytics techniques, with knock-on implications for the bottom line



NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute, Notes from the AI Frontier, April 2018, McKinsey Global Institute analysis

Industry 4.0, specifically, can enhance performance across the manufacturing value chain



1 Cf. McKinsey Global Institute: Big data: The next frontier for innovation, competition, and productivity2 McKinsey analysis3 McKinsey analysis4 Cf. McKinsey Global Institute: A future that works: Automation, employment, and productivity, January 20175 See, for example, ABB case study6 Cf. Bauernhansl, Thomas, ten Hompel, Michael, Vogel-Heuser, Birgit (Hrsg.): Industrie 4.0 in Produktion/Automatisierung/Logistik (2014)

SOURCE: Industry 4.0: How to navigate ditigisation of the manufacturing sector, McKinsey Digital, 2015.

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A rising superstar effect: Economic profits are more concentrated today than they were 20 years ago

Share of global revenue and profit accruing to superstar firms, 1990s vs today

n = 245 firms in 1995–97 and 575 firms in 2014–16 %



Top 10% of economic profit

Average, 1995–97 Average, 2014–16



Top 1% of economic profit

1 Nonfinancial firms only. EBITA stands for earnings before interest, tax, and amortization. NOPLAT stands for net operating profit less adjusted taxes.

SOURCE: McKinsey Corporate Performance Analytics; McKinsey Global Institute analysis

Emerging economies exhibit greater contested leadership among top firms

Distribution of trajectory for top quintile economic profit generators over 10 years¹ % (N = 48 countries and 2,284 total companies^{2,3})



Quintiles based on rankings within archetype by economic profit generation between 2001–05 and 2011–15. Economic profit defined as net operating profit less adjusted taxes (NOPLAT) – [invested capital x weighted average cost of capital].
 Quitperformers include China, India, Indonesia, Malaysia, Thailand, Hong Kong, Singapore, and South Korea; high-income countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, Netherlands, Norway, Saudi Arabia, Spain, Switzerland, United Arab Emirates, the United Kingdom, and the United States; non-outperformer emerging economies include Argentina, Brazil, Chile, Colombia, Czech Republic, Egypt, Greece, Hungary, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Russia, Slovak Republic, South Africa, and Turkey.

3 Publicly listed companies with more than \$500 million in revenue in 2016, of which 457 were top quintile

SOURCE: McKinsey Strategy Practice (Beating the Odds model v20.0); McKinsey Corporate Performance Analytics; McKinsey Global Institute analysis

Top firms in outperformer emerging economies are bolder, quicker, and more forceful than their peers

Comparison of self-reported performance and practices for top-performing firms across archetypes^{1,2} Absolute difference compared to top-performing firms from high-income economies N = 7 countries, 2,172 companies³

Geographic Innovation and digital disruption Investment expansion Innovation Innovation Disruption **Digital disruption** assessment practices⁴ Investment levels⁷ Sales from new proactiveresponse⁶ **Expansion priority** products ness⁵ Capex to depreciation Investment speed Markets outside home Score Score (percentage points) (1 to 10) Percentage points (1 to 8) Number of weeks (percentage points) ratio **Outperformers** +8 1.3 +33 +1.1+1.1-6.0 +27vs high income Non-0.8 +0.5+0.3-7.9 +13outperformers vs -6 high income **High income** 6.5 25 3.2 1.5 18.7 48

1 Top-performing defined as top quartile of self-reported revenue growth (over past 3 years) adjusted for country and industry.

2 All reported statistics are calculated as weighted averages across countries within archetype.

3 Outperformers include China, India, and Indonesia; non-outperformer emerging economies include Brazil and South Africa; high income includes Germany and the United States.

4 Score marks number of dimensions for which respondent answered either "Strongly agree" or "Agree" among 10 dimensions that describe the company's current innovation capabilities and practices.

5 Proactiveness measured as answering either "We have changed our longer-term corporate strategy to address the disruption" or "We initiated the disruption(s)" to question "Which of the following statements best describes your company's approach to addressing the technological and digital disruptions that have affected your industry in the past three years?"

6 Score marks number of "changes [made] to the strategy of individual business units...in response to technological and digital disruptions that have affected your industry in the past three years."

7 Based on financial data for large publicly listed companies with more than \$500 million in annual revenue; top performing defined as top quartile in terms of total return to shareholders adjusted by industry. NOTE: Not to scale.

SOURCE: McKinsey 2017 Firm Survey; McKinsey Corporate Performance Analytics; McKinsey Global Institute analysis

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Three types of ecosystems emerging as sources of value creation

Linear value chains



Built around linear **series of valueadding steps** with the goal of producing specific end products (e.g., Ford)

Horizontal platforms



Built around value-adding software and technology stacks that cut across value chains (e.g., Google, Facebook)

Any-to-any ecosystems



Built around value-creating interactions that quickly adapt to new needs and ideas (e.g., Airbnb and Uber)

Businesses are utilising new technologies to create "Markets of One"

Robotic manufacturing



Adidas's robot-operated "SpeedFactories" create consumer-designed individualized sneakers

adidas

Augmented reality



IKEA's augmented reality catalogue on iPad visualizes new furniture inside the consumer's home



3D printing



Doob Group allows consumers to scan their bodies and provides unique 3D-printed selfie figurines



Big data & analytics



Spotify creates tailored music recommendations based on playlists generated by other users



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Nearly 50% of tasks could be automated by 2030, affecting 760 million workers in emerging economies



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Demand for skills will shift due to automation and AI

Based on McKinsey Global Institute workforce skills model

United States, all sectors, 2002–30



1 Calculated using the 2004 to 2016 CAGR extrapolated to a 14-year period.

NOTE: Based on difference between hours worked per skill in 2016 and modeled hours worked in 2030. Numbers may not sum due to rounding.

SOURCE: U.S. Bureau of Labor statistics; McKinsey Global Institute workforce skills model; McKinsey Global Institute analysis

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Taking into account the undermeasured aspects of service flows, services already account for more than half of value added in overall trade \$ trillion, 2017



1 Higher-end estimate.

2 In value-added terms. The value of services embedded in goods trade and the value of goods embedded in services trade have been removed.

NOTE: Services embedded in goods trade defined as services value added in goods trade. Estimate of intangibles provided to foreign affiliates based on company-level data on foreign

affiliate economic profit and expenses, adjusted for the share of revenue associated with intangibles produced by headquarters country. Estimate of free cross-border digital services based

on the number of foreign users of global websites and the implied value of digital services (such as social media and messaging services).

SOURCE: Capital IQ; WTO; IMF; World Input-Output Database; Alexa Web Information Service; McKinsey Global Institute analysis

The share of global trade based on labor-cost arbitrage is less than 20 percent %



1 Excluding energy, mining, and agriculture.

2 Australia, Hong Kong, Japan, New Zealand, Singapore, and South Korea.

NOTE: Labor arbitrage defined as exports from a country whose GDP per capita is one-fifth or less than that of the importing country. Figures may not sum to 100% because of rounding.