# A NEW INDUSTRIAL REVOLUTION...THIS TIME DIGITAL



### THE GLOBAL ECONOMY IS UNDERGOING A THIRD WAVE OF INVENTION, this one digital, whose effect on living standards is yet to be seen

The world has gained from the recent "digital revolution", but the innovations have also disrupted traditional growth patterns. Historically, industrial revolutions have produced losers as well as winners, and it has often taken time to see how different stakeholders would fare. Among major economies including the US and the UK, growth in recent decades has slowed compared to the past century averages, a reminder of the harsh nature of industrial revolutions



### Three Industrial Revolutions and Impact on GDP per Capita Growth (In Average Annual Percent Growth over 25 Year Periods, 1775-2010)

Sources: Maddison Project; "The third great wave", Special Report: The World Economy, The Economist, Oct. 2014

# A DIGITAL REVOLUTION WILL FACILITATE THE CREATION OF AN INDUSTRIAL INTERNET ECONOMY with the potential to add US\$15.3 Trillion to the global economy by 2030

The Industrial Internet, otherwise known as the "Internet of Things", describes the integration of physical machinery through Internet-connected sensors and software systems. By 2020, global spend on industrial Internet technology is expected to reach US\$ 514 Billion, with a return on investment of nearly 150%. The current industrial Internet market opportunity is estimated at US\$ 32.3 Trillion, equal to 38% of the global economy, with the potential to add more than US\$15 Trillion to the global economy by 2030

### Industrial Internet Market Opportunity Value (In US\$ Trillion 2013)



#### Potential Impact of Industrial Internet on 2030 Global Economy (In US\$ Trillion 2030)



Source- Upper Chart: Industrial Internet Insights Report GE and Accenture, 2015

Sources- Lower Chart: Industrial Internet Insights Report GE and Accenture, 2015; World Bank Databank

# THE DIGITAL REVOLUTION WITH 3D PRINTING / ADDITIVE MANUFACTURING IS RESHAPING SUPPLY CHAINS, enhancing localization and

The 3D printing market exceeded US\$ 2.2 Billion in 2012 and is expected to approach US\$ 12 Billion by 2020. Initially a tool for product design and development, 3D printers are increasingly used to manufacture finished parts and goods, disrupting traditional supply chains by enabling enhanced localization and customization. As technology progresses, goods will increasingly be produced by smaller, flexible workforces in close proximity to their point of consumption

Supply Chain Evolution Driven by 3D Printing

customization



### Share of End-Use Parts and Final Products Produced Through 3D Printing

(In % of Total Products Produced Through 3D Printing, 2003-2012)



### Projected Growth of 3D Printing Market

(In % of Total Products Produced, 2009-2020)



2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Source- Upper Chart: Wohlers 3D Printing Industry Report 2013 Source- Lower Charts: Credit Suisse

# GLOBAL MANUFACTURING IS MOVING EAST BUT MANY EMERGING COUNTRIES ARE "DEINDUSTRIALIZING" TOO EARLY in their development

With the advancement of technology and the spread of global supply chains, the past century has witnessed the fastest shift in the geographic distribution of manufacturing in history. The developing world now produces nearly 40% of the world's manufactured output, while the share from developed Western countries has dropped from more than 80% to just over 50% in the same period. But the connection between industrialization and wealth-creation is being tested. Developing nations are reaching their cap level of industrialization at very low income levels, making it hard to imagine other routes for increasing income



Distribution of Global Manufacturing Output over Time (In % of Total Manufacturing Output, 1750-2009)

Employment in Industry and Income Level at Peak Industrialization (In % of Workforce Employed in Industry, Year of Peak Industrialization)



Sources- Upper Chart: "International Industrialization Levels from 1780-1980", Paul Bairoch, 1982; "The Clash of Civilizations", Samuel Huntington, 2007; Moroan Stanley

Sources- Lower Chart: World Bank Development Indicators; "Emerging Economies: Arrested development", The Economist, Oct. 2014

# WITH ALL ITS POTENTIAL **BENEFITS. THE DIGITAL REVOLUTION IS THREATENING TO BF JOB DESTRUCTIVE**, and has not vet resulted in the sought-after productivity gains

Half of US iobs face at least a 65% likelihood of being computerized in the coming decades. Jobs that remain will require a multi-dimensional workforce skilled in technology, problemsolving, and interpersonal relations. While computerization is largely driven by the efficiency benefits of technology, global productivity growth has slowed over the past two decades, with total factor productivity dropping below zero in 2013, to -0.1%. Policymakers expect the productivity gains from the digital revolution to become clearer in the future

### Number of Job Occupations by Susceptibility to Computerization



#### Growth in Global Total Factor Productivity and Technology Application (In % Y-o-Y Growth and Users per 100 People, 1997-2013)



Note: (1) All segments five point intervals Source- Upper Chart: "The Future of Employment: How Susceptible are Jobs to Computerisation?", Carl Benedikt Frey & Michael A. Osborne, 2013 Sources- Lower Chart: The Conference Board Total Economy Database; World Bank Development Indicators