



'Industry 4.0'

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We are in the midst of a revolution

Industry 4.0

Will Robots Replace You on The Roads?

Vinod Khosla: Doctors cannot compete with machines

Venture capitalist Marc Andreessen explains how AI will change the world

Reviving Japan's Dairy Industry, One Milking Robot at a Time

A big Dutch bank is replacing 5,800 people with machines, at a cost of \$2 billion

The Robots Are Coming. Welcome Them

Robots running things in Rotterdam

25 February 2015 | John Churchill

With its remote-controlled cranes, fully automated machines and wind-powered operations, APM Terminals' Maasvlakte II terminal in the Port of Rotterdam in the Netherlands is setting new standards for the terminal industry.

Volvo Plans to Offer Fully Self-Driving Car to Luxury Buyers

Why Hire a Lawyer When a Robot Will Do?

nuTonomy beats Uber by launching self-driving cars

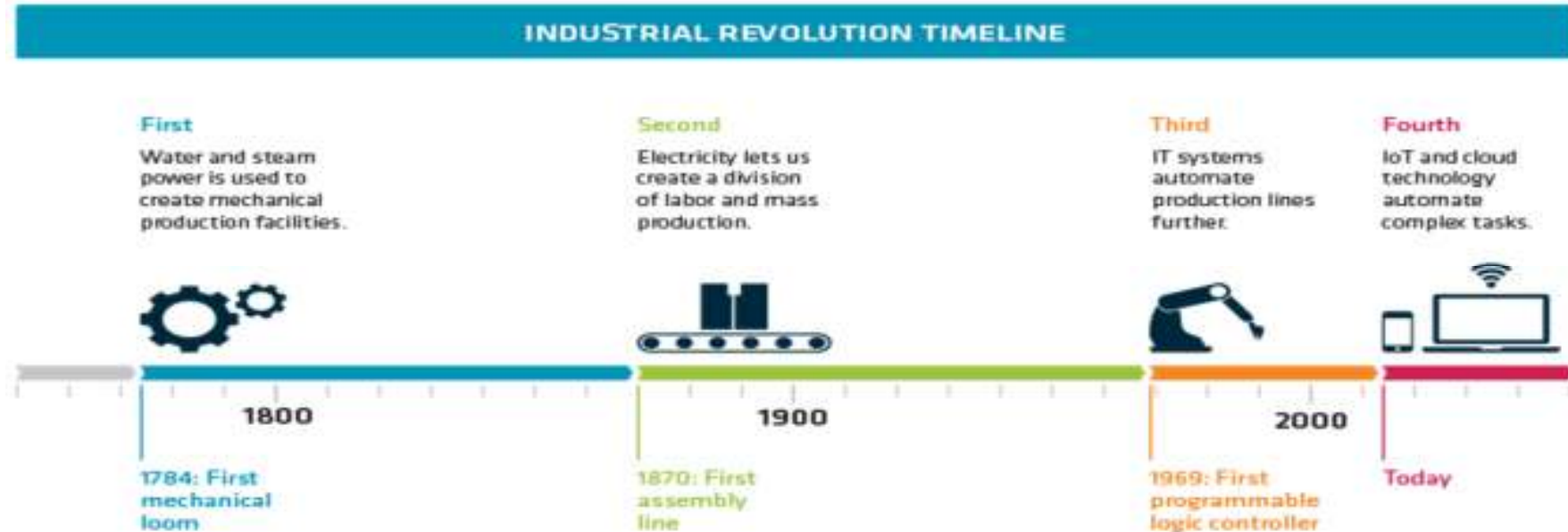
Driver less cars is a reality in Singapore

Bankers, Robots Are Coming for You Too

Source: Various

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Industry 4.0



The “fourth” Industrial Revolution, after steam power, electricity, and computers defined the first three, the next will be shaped by sensors and artificial intelligence.

When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.

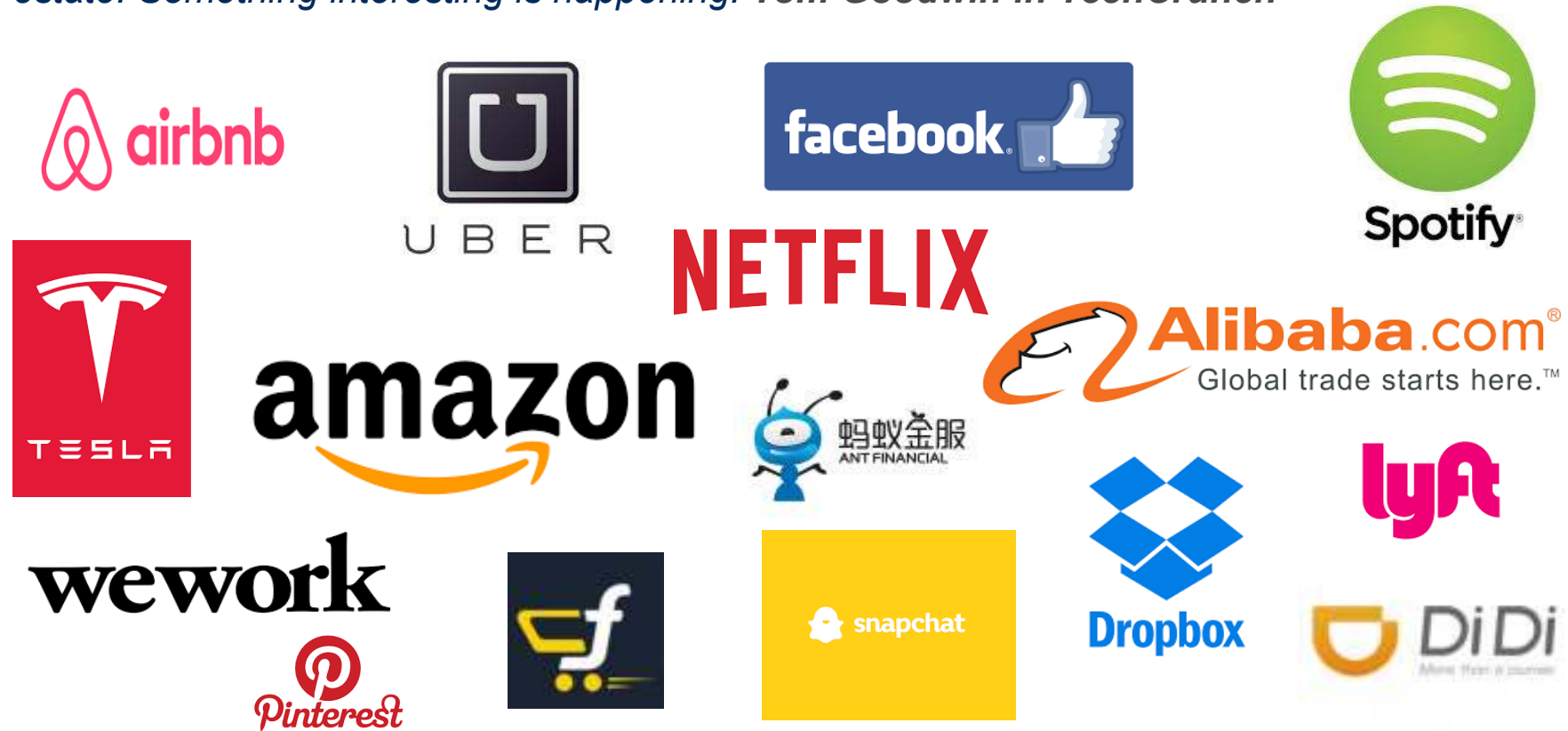
Klaus Schwab, founder and orchestrator of the WEF Davos

Source: Mjølner Informatics, WEF

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Digital Disrupters! What will **Artificial Intelligence** bring?

"Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening. Tom Goodwin in TechCrunch



Source: Various

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Economic impact of the Digital Revolution

Productivity

- **Productivity is likely to grow leaps and bounds**
- *The effect of technology on global productivity is likely to be immense. The rise of machine intelligence, robotics will see redundancy in assets, capital and labour.*

Labour & Employment Patterns

- **Labour entering a new phase, the great divide**
- *Past Industrial Revolutions have boosted productivity with gains split between skilled and less-skilled workers, and between owners of capital, workers and consumers.*
- *Industry 4.0 is empowering right skilled individuals as never before and opening up the great divide between the employability/earnings of the skilled and the unskilled, capital-owners and labour.*
- **Removal of middle income, more hourly paid workers and highly paid skilled and technology enablers.**

Real Estate

- **Disruption of “real estate values”**
- *Less need for shopping malls, parking and roads, office space— need more city fringe warehouses, distribution centre*

Source: Bloomberg, Economist, WSJ, Various

Consumption Patterns

- **Consumers a major beneficiary of the “digital age”**
- *Less disposable income as more “hourly workers”*
- *Higher spend of the consumption wallet online on non – physical goods*
- **Less spending on physical goods**

Manufacturing Technology

- 3D and now 4D printing
- *Benefits of “Economies of Scale” disappear*
- *Enabling of “low volume manufacturing” leading to more “near shoring” and “bespoke production”*
- **Technology creates level playing field and allows niche producers to compete**

Merger / Miniaturisations of devices

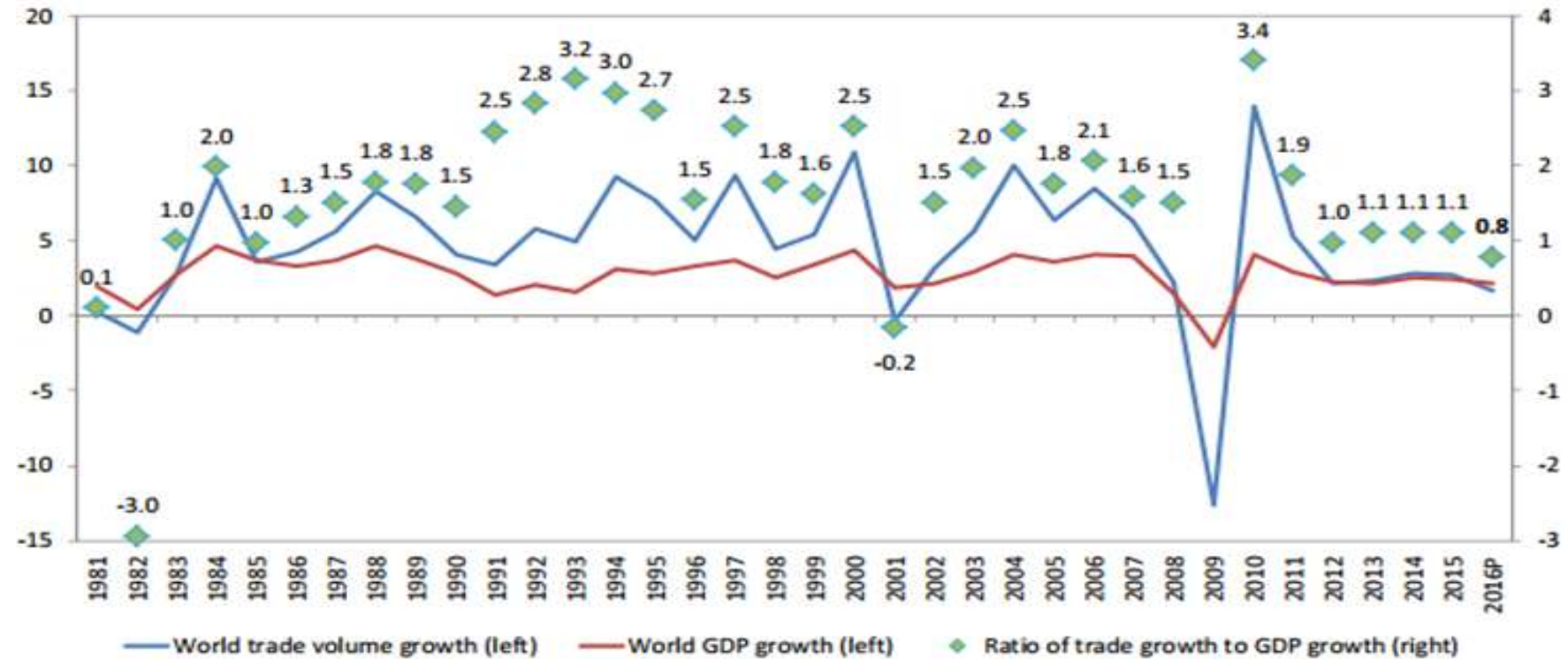


- **Physical shipping volumes to reduce**

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Shipping Volumes being disrupted

Ratio of world merchandised trade volume growth to world real GDP growth, 1981-2016



- **Historical co-relationship between global trade and GDP is being disrupted**
- Growth in global trade will fall below GDP growth for the first time in 15 years this year, according to the World Trade Organisation, which has slashed its forecasts over the next 12 months recently.

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Survival! How?

- *The digital economy isn't just about speeding up communication across borders or changing the skills workers need; it's about changing the very nature of consumption, competition and how industries work.*
- *Industry 4.0 is also driving a significant shift in the balance of power between organisations and individuals.*
- *Capital, raw materials and human resources, each have at varying times in history demanded an economic "premium" over the others. Going forward all three will remain abundantly supplied and hence cheap.*
- *"Innovative human capital" will be disproportionately rewarded given the ability to adapt in a rapidly changing economic environment.*

"It is not the strongest of the species that survives, nor the most intelligent; it is the one most adaptable to change."

— attributed to Charles Darwin, British naturalist.



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