



'Industry 4.0'

Eight City of London Biennial Meeting

17th November 2016

Arjun Batra,
Group Managing Director, Drewry Shipping Consultants Limited
batra@drewry.co.uk

www.drewry.co.uk

[Maritime Research](#)

[Maritime Advisors](#)

[Supply Chain Advisors](#)

[Maritime Financial Research](#)

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

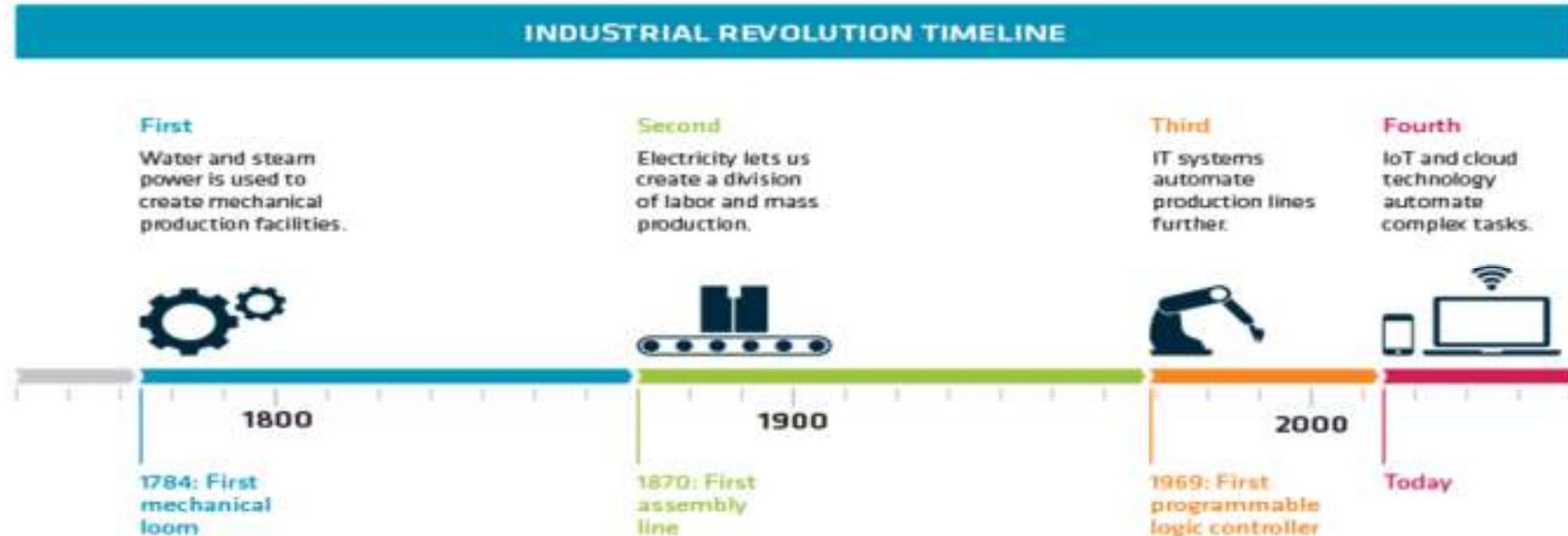
Driver less cars is a reality in Singapore

Bankers, Robots Are Coming for You Too

Source: Various

We are in the midst of a revolution

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.

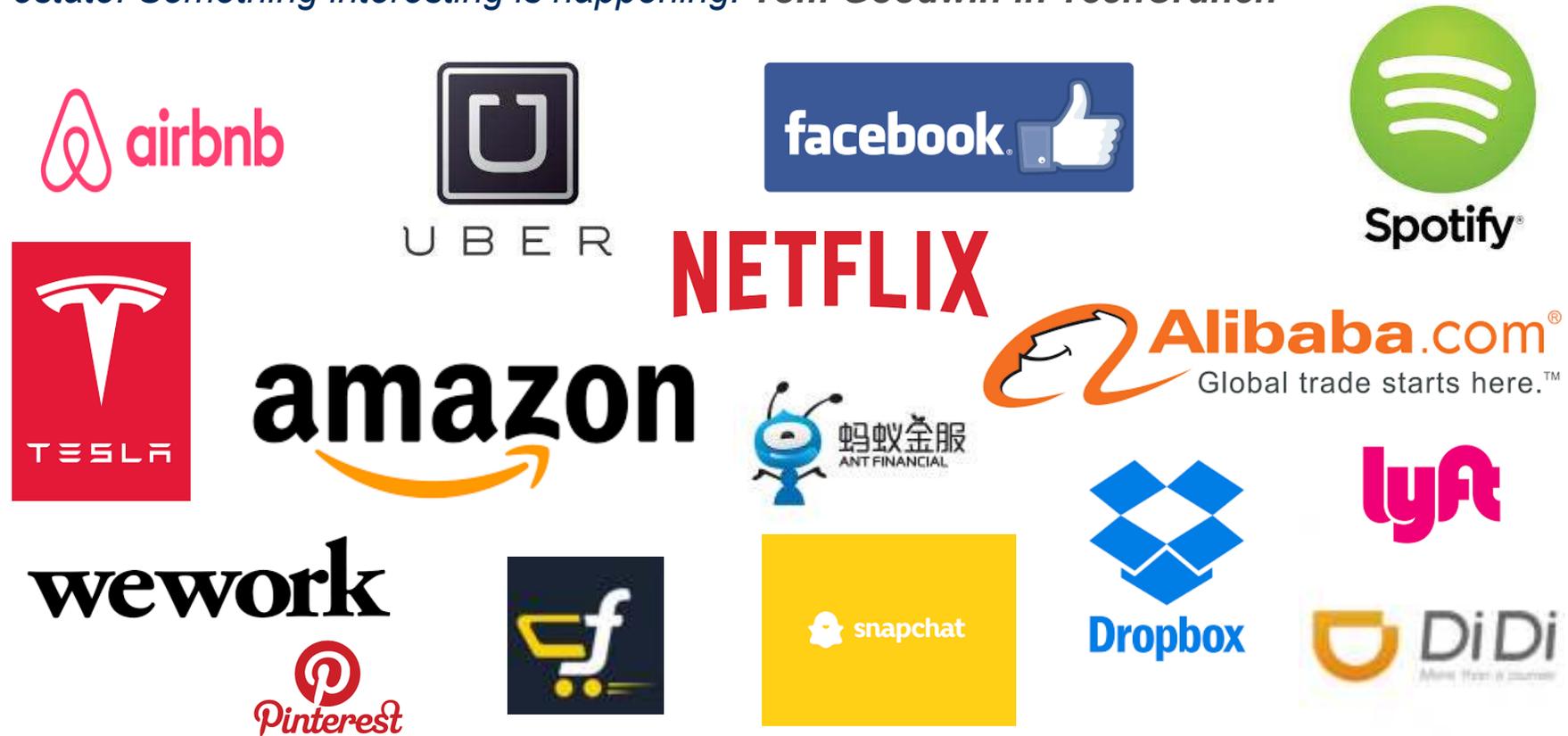
Klaus Schwab, founder and orchestrator of the WEF Davos

Source: Mjølner Informatics, WEF

We are in the midst of a revolution

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

We are in the midst of a revolution

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

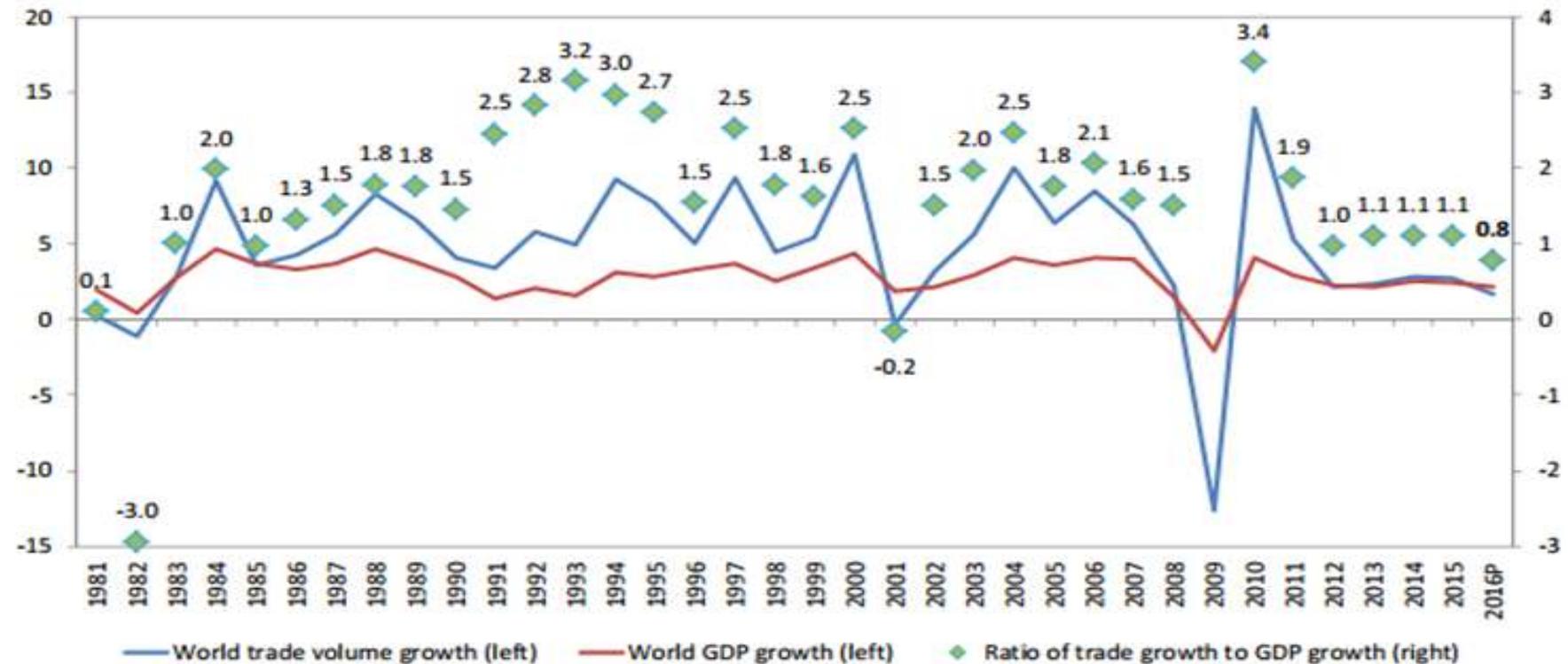


- **Physical shipping volumes to reduce**

We are in the midst of a revolution

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.

We are in the midst of a revolution

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.



The primary source of market insight, analysis and advice trusted by the global shipping industry.

Maritime Research

Robust, objective market analysis and forecasts to inform business decisions

Market Sectors

Container Shipping
Ports and Terminals
Dry Bulk
Gas Shipping
Tanker Shipping
Specialised Shipping
Ship Management
Logistics Management
Intermodal Transport

UNITED KINGDOM

15-17 Christopher Street
London
EC2A 2BS
United Kingdom
T +44 20 7538 0191

INDIA

209 Vipul Square
Sushant Lok - 1
Gurgaon 122002
India
T +91 124 497 4979

Maritime Advisors

Bringing together the expertise, insight and resources clients need to achieve their commercial ambitions

Advisory Expertise

Market Analysis
Strategy and Planning
Market Entry Analysis
Operational Due Diligence
Technical Due Diligence
IPO Support

Supply Chain Advisors

Tools, resources and tailored advice to support every stage of the ocean freight procurement process

Advisory Expertise

Ocean Freight Cost Benchmarking
Ocean Freight Procurement Support
Network Design and Optimisation
Commercial Due Diligence
Hinterland Logistics Analysis

Maritime Financial Research

A truly independent investment research and advisory service on companies operating within the maritime industry

Market Sectors

Container Shipping
Container Manufacturing
Ports and Terminals
Dry Bulk
Gas Shipping
Tanker Shipping

Advisory Expertise

Credit Analysis
Bond Analysis



CHINA

Unit D01, Level 10,
Shinmay Union Square
Tower 2, 506 Shangcheng Rd
Pudong District, Shanghai
China, 200120
T +86 21 5081 0508

SINGAPORE

#13-02 Tower Fifteen
15 Hoe Chiang Road
Singapore 089316
T +65 6220 9890



www.drewry.co.uk