

The Future of Work

The status quo no longer exists

The future of work ?



Format of talk

- **Intro – setting out the canvas**
- **Brief history - how we got here**
- **General**

Predictions are difficult

- And often wrong
- But how can societies prepare without
- Assumptions about future ?

Paid work quintessential

- Number of people having paid work in a society has huge implications
- Their taxes fund physical & social infrastructure

BUT – HOW governments tax and spend is critical
- - politics (not for this talk) but note:

- USA ^ UK ^ W.Europe ^ Scandanavia

Paid work is major thread in our lives

Work is where

- We fund our personal lives,
 - find friends, make relationships,
 - develop experience and skills
 - sometimes enjoy ourselves.
-
- We sometimes complain about work - but it is super-important

What factors changed human progress?

- Domestication of animals – oxen, horses?
- Philosophers? Religions?
- Great wars?
- Rise and fall of Empires?

Actually
None of the above had much
Influence on human
Development

IT WAS TECHNOLOGY
And

SCIENCE

- **90,000 years FORAGING period**

90% of Human history in caves – it's hard work
– paid work unknown - bartering?

- **12,000** years **AGRICULTURAL PERIOD** still hard work - paid work increasing:
- **GENERAL PURPOSE TECHNOLOGY**
- of its time.

- **250** years INDUSTRIAL period
- 1750 - now
- 70 yrs DIGITAL age - 1945? - into future

Industrial Period

- Greatest change in humankind's history
- Transformed societies
- General Purpose Technology
- Physical work replaced by steam + machines
- Rural replaced by urban
- Massive growth of factories, railways
- Work, society, culture, transport, everything
- Changed over c.100 years

From Now Forward

- Three Newish forces:
- Globalisation - increased competition &
- Markets
- Demographic Changes – migration, aging
- Super-rapid Technological Change

From now on

- **Super-Rapid Technological Change**

Digital- - - - - Exponential - - - - - Combinatorial

- . Given variety & number of tech developments already in pipeline
combinatorial possibilities are prodigious.

- See Erik Brynjolfsson and Andrew McAfee

Super-rapid Technological Change

- Tech change has been rapid for 30 years +
- Exponential change from now on
- Rice and the Chessboard
- Ray Kurzweil predicts technological 'singularity' in 2045, within your grandchildren's life span

See [The Singularity Is Near: When Humans Transcend Biology](#), 2005

Effects on Societies

- We can expect disorienting, disruptive and uncomfortable change.
- Many jobs eliminated or taken over by technologies. Perhaps 35 % in 20 yrs, 50 % in 30 yrs.
- At least 50% of current businesses significantly impacted by technologies.
- Current low-skilled jobs most at risk
- BUT even professional jobs will be effected – eg
- Medical analysis and diagnosis will be made more accessible, faster, cheaper, more accurate.

Effects on Societies

More technology means more capital expenditure for business And government.

Increasing clever technology scenarios will exist in all developed countries

Internal competition

Associated Issues

- Since recent recession economies of many countries have struggled to return to normal growth levels.
- Wages/salaries of working class and lower middle class have stagnated over last 20 (30 in USA) while salaries of high level managers and professionals have risen sharply.
- Are we already seeing signs of fast tech change and substitution?

What needs doing now?

- * More awareness by government and private sector of future of work issues
- * Throughout education prepare people for challenges - science, technology, engineering, maths (a), plus resilience, adaptability.

Appendix 1 - technologies

- 3D Displays; Holography; Cloud Technology;
- Faster communication; Memory Techs; Quantum Computing
- Personalised Medicine; Brain-Computer Interfaces:
- Airless tyres: Driverless cars; Evacuated tube Transport;
- Paper-thin Flexible computers and mobiles;

Technologies continued

- A.I. based Virtual Assistants; Nano-technology;
- 3 D printing; 3D bio-printing; organisational dynamics; Big Data;
- Wearables; Robotics everywhere; Drones, Machine Learning; Materials;
- Amorphous Metals; Programmable Matter
- High-Temp Super-conductivity & Super Fluidity;
- Note Kurzweil's weekly update

Appendix 2 - Resources

- Ray Kurzweil -*The Singularity Is Near: When Humans Transcend Biology, 2005*; and TED
- Eric Brynjolfsson and Andre McAfee, *The Second Machine Age; Work, Progress, and prosperity in a time of Brilliant Technologies.* 2014.
- Thomas Piketty, *Capital in the twenty First century,* 2014.

Appendix 2, Resources continued

- Richard Donkin, *The Future of Work*, 2010.
- Government Report, *The Future of Work: jobs and skills in 2030*, 2014
- The Work Foundation, Lancaster University, Reports.
- Big Innovation Centre (Will Hutton) Publications
- Deloitte Reports

