

A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue background, resembling a circuit board or a neural network.

EMERGING FRONTIERS: STI DEVELOPMENT with IMPLICATIONS FOR SDGs

XIAOLAN FU

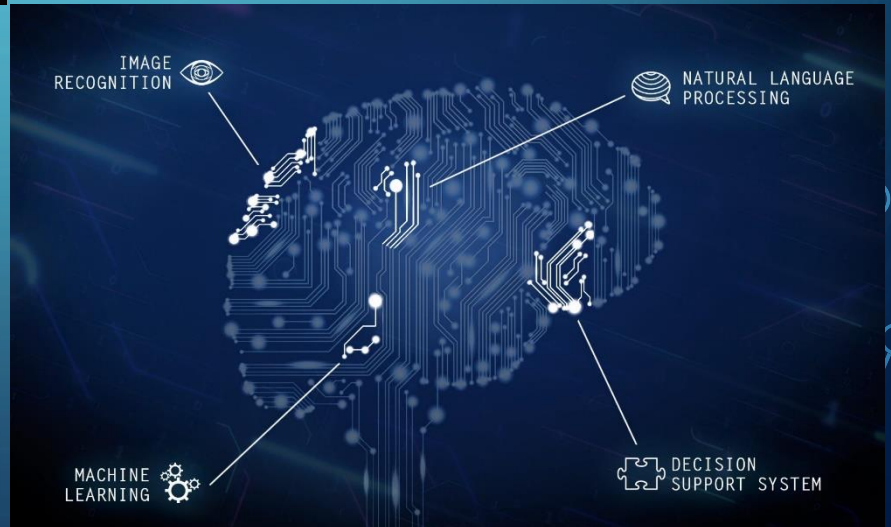
OXFORD UNIVERSITY

EXPONENTIAL TECHNOLOGICAL CHANGE

ARTIFICIAL INTELLIGENCE



Alpha Go
Driverless car, ...



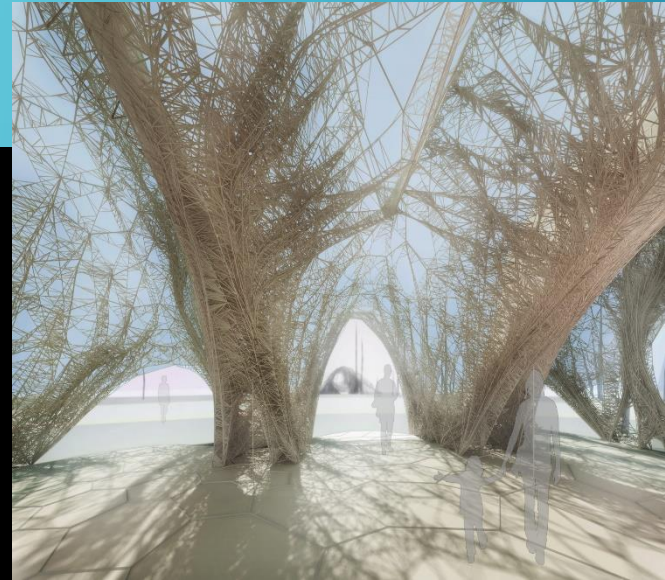
ROBOTICS



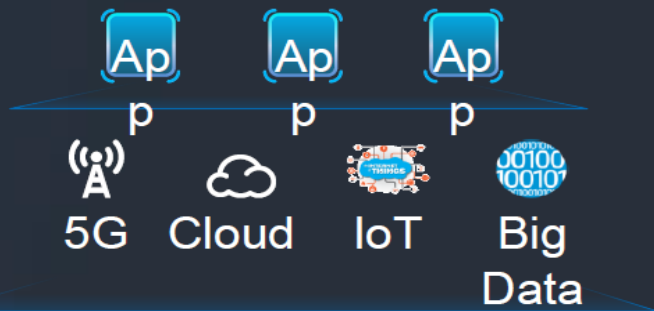
Smart manufacturing,
IoT,
Industry 4.0,



3D PRINTING



Intelligentization



Everything is connected

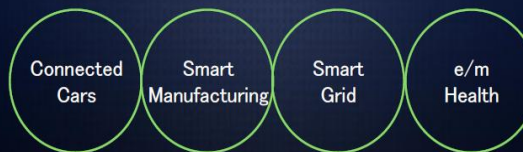


Everything is intelligent

WIDE APPLICATIONS IN MANUFACTURING & BEYOND, PRIVATE & PUBLIC SERVICES

Source: Gartner, 2016;
Weigel, 2016

Critical Industries Connected



Y2025:100 Billion

10B
People

90B
Things

Smart
cities

The background is a blue gradient. In the corners, there are white line art designs resembling circuit boards or neural networks, with lines and small circles connecting them.

IMPACT ON SDGS: MIXED

The background of the slide features a dark blue gradient with white, stylized circuit lines and nodes. These lines are concentrated along the left and right edges, with some extending towards the center. The nodes are small white circles at the intersections of the lines.

- **Connectivity enhancing & human empowering**

Eg. Mobile phone tech, internet, Cloud, 5G, big data

Impact: connectivity, access, empowerment, efficiency, making impossible possible. - Universal

- **Human replacing**

Eg., automation, robotics, AI

Impact:

1. Efficiency gains, consumer welfare
2. Work condition improvement
3. Labour replacing
4. Income inequality

EMPLOYMENT CHALLENGE

- Job replacement
- In a wide spectrum of sectors, not only blue collar workers (from lorry drivers, office white collar, to highly skilled financial sector)
- Difficulties in re-employment for some.
- Political instability & social un-sustainability

DISTRIBUTIONAL EFFECT

- Biased technical change
- Greater income inequality (significant)
- Capital vs labour; Skilled vs un-skilled
- Challenges to low income countries: further backwardness
- Deepening global income divide

CHANGES IN GLOBAL ECONOMY

- Re-shore of manufacturing back to developed countries
- Opportunities for LDCs to catch up narrowed
- Revolution in global production network led by 3D printing
- Distributed localised production replaces mass production
- Challenges to China: the world's manufacturing workshop

POLICY IMPLICATIONS

- Policy guidance
- Policy to remedy negative effects
- Policy to assist LDCs
 - Technology transfer, cooperation in training.
 - MNEs to play a more active role
 - Global governance reform, partnerships

GLOBAL PARTNERSHIP & EFFORTS

- 2030 global Sustainable Development Goals (SDGs)
- UN Technology Transfer Mechanism (TFM)
- UN Technology Bank for LDCs

