THE IMPLICATIONS OF 4th INDUSTRIAL REVOLUTION

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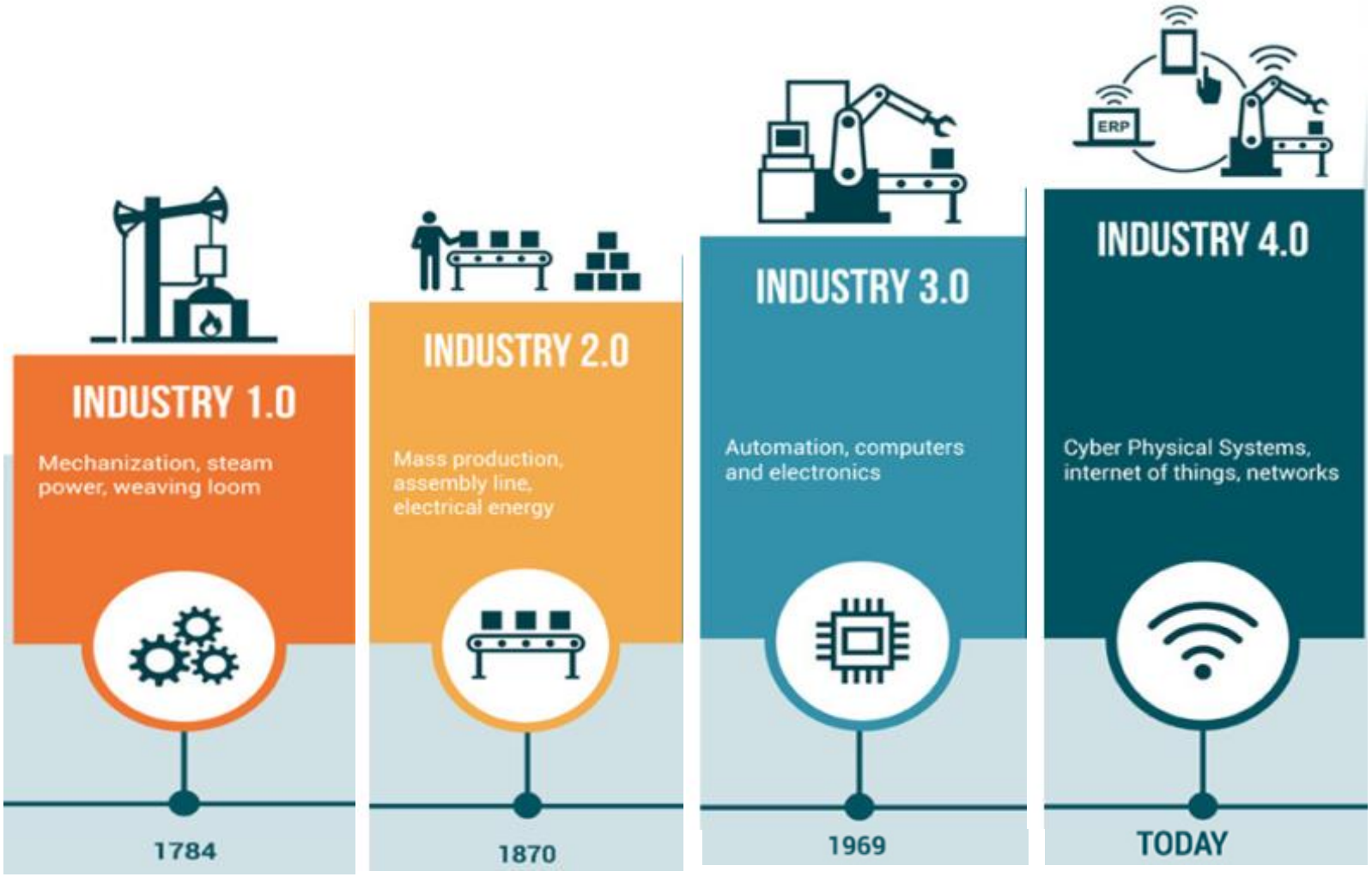
Industrial Revolution

Transforming Industries and Innovation



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Building Blocks

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Building Blocks

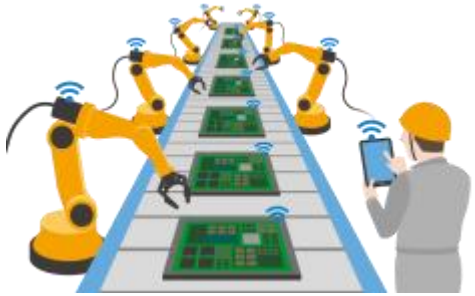
3-D Printing & personal fabrication

- Advanced manufacturing
- Tailor-made products
- Smart-materials

Internet of Things & Cloud Computing

- convergence of Automation and Information technologies
- Storage in the Cloud

Robotics



- robot intended to physically interact with humans in a shared workplace

Building Blocks…

Artificial Intelligence

- Machine learning - to imitate intelligent human behaviour
- based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering

Big data

- Volumes of data generated on a daily basis
- Sources of data extremely diverse
- Fluidity of data enhanced
- Processing and storage of data enabled by smart machines

Why Do We Care?

Impact on
production and manufacturing of goods and products.

Economic Implications
Regulatory Implications

Why do we care?...

- ***Velocity***: Evolving at an exponential rather than a linear pace
- ***Scope***: Disruptions are taking place in almost every industry in every country
- ***Systems impact***: The breadth and depth of these changes herald the transformation of entire systems of production, management, and governance
- **Technology advances** keep expanding the benefits of the digital revolution across the planet

Advantages

- Improves the ***flexibility***, ***speed***, productivity and quality of the production process
- Allows for a faster response to customer needs than is possible today
- Product life cycles become shorter leads to more production
- Robots, smart machines and smart products that are able to communicate with one another

Economic Catch-up

- Successful catch-up demonstrators: Hong Kong, Singapore, South Korea, and Taiwan, "Asian Tigers" China and India - on the trail

- ***Economic "catch-up":*** country's growth rate of per capita income has risen above the global average or that of a comparison group (Lee 2013).

- ***Technological "catch-up":*** generation of technological innovations at a faster rate than that of industrialized economies (Lee 2013)

Key Factors for Catching up

- technological specialization in terms of
  - ✓ ***cycle time*** (i.e. short-cycle versus long-cycle technologies)
  - ✓ ***degree of origi***nality (i.e. low-originality versus high-originality technologies)

- Transition from reliance on foreign knowledge to the ***localization of knowledge creation and diffusion*** (i.e. the indigenization of knowledge)

- Diversified versus concentrated growth strategies

SA Status Quo

Implications for Government

- Embrace agile governance to adapt to a new fast-changing world
- Increase investment in R&D and disruptive technologies
- Develop regulatory framework that stimulates industry use of home-grown technologies
- Develop a series of standards that the devices and components will have to comply with
- Produce more highly skilled people e.g. engineers, scientists, industrial designers, etc
- Develop labour laws to attract a talented workforce and create well-paying jobs
- Deal with high costs of connectivity and low bandwidth speeds

Challenge: Regulator

BIG DATA

experts view big data as

"the new electricity" — the power source driving change in the way that steam, actual electricity and digital technology did before it.

Challenge: Regulator

- Capacity and Capability to handle big data
  - ✓ Infrastructure - capture, storage and processing
  - ✓ Skilled labour
  - ✓ Adequate tools - manipulation and interpretation (CHPC)
  - ✓ Networks – sharing and mobility
- Flows and Fluidity of data
  - ✓ Access control/Protection - Who has access
  - ✓ Flows to unexpected areas during manipulation & interpretation

Encourage and enable sharing ⟷ **Limit /disable monopoly**

Paradigm Shift

Policy /Regulation	• Futuristic • Agile
Labour	• Re-skilling • Adequate HCD
Infrastructure	• Acquisition • Intelligent programming
Organisations	• Capacity and Capability building
Agencies	• 360% perspectives of the society


Thank you