FORESIGHT FOR DIGITAL DEVELOPMENT

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1: DIGITAL FORESIGHT
DIGITAL INFRASTRUCTURE AND TECHNOLOGY FORESIGHT
- ICTs for SDGs
- Digital Divide
- Technology Foresight

2: DIGITAL TRENDS
BIG DATA, IoT, 3D PRINTING, AUTOMATION, MOOCs
- 4 Digital Trends
- Opportunities for Development
- Risks and Challenges

3: DIGITAL POLICY
MAXIMIZING DEVELOPMENTAL IMPACT
- Conduct Foresight Studies
- Promote Pro-poor Innovation
- Regulatory Frameworks
ICTs are critical for achieving the SDGs. However, ICTs bring both opportunity and risks.

**ECONOMY**
- Higher productivity and industrial transformation

**ENVIRONMENT**
- Decoupling good and services production from carbon emissions

**SOCIETY**
- Increased social inclusion and integration
1. DIGITAL FORESIGHT

DIGITAL INFRASTRUCTURE AND TECHNOLOGY FORESIGHT

ADDRESSING THE CONTINUING DIGITAL DIVIDE

2000-2015

GROWTH IN MOBILE NETWORKS

SIGNIFICANT DIGITAL CHALLENGES

EXPANSION OF EXISTING BROADBAND INFRASTRUCTURE

NEED FOR LARGE CAPITAL INVESTMENTS

LACK OF DIGITAL CONTENT

SHORTAGES OF RELEVANT SKILLS

DIGITAL DIVIDE REMAINS

SDG 9C states to "Significantly increase access to information and communication technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020."
TECHNOLOGY FORESIGHT FOR POLICY MAKING

1. DIGITAL FORESIGHT

2. WHAT IS TECHNOLOGY FORESIGHT?
   - Forecasting evolution of technologies and their impact on society for policy making and firm-level strategy.

3. 1970s
   - Japan conducted foresight studies on electronics sector since WSIS Summit in 2003 & 2005, lots of changes in the information society.

4. THERE ARE MANY FORESIGHT METHODS
   - Focus groups
   - Delphi method
   - Simulations
   - Scenario building
   - Interviews

   Web 2.0
   - Broadband
   - Cloud Computing
   - Mass Mobile
   - Social Media
   - Big Data

1. DIGITAL FORESIGHT
2. DIGITAL INFRASTRUCTURE
3. TECHNOLOGY FORESIGHT
FOUR BROAD DIGITAL TRENDS

1. Big Data & IoT
   - Big Data: Huge volumes of data and data analysis.
   - Internet of Things: Internet-enabled sensor devices

2. MOOCs
   - Online courses that allow open access and unlimited participation.
   - Social sharing, interactive learning

3. 3D Printing
   - Printing physical items with ink layer by layer
   - Additive – rather than subtractive – manufacturing

4. Automation
   - Ability of computers to take over cognitive – and not just physical – tasks.
   - Productivity growth without job growth

Digital Trends

Built on current ICT infrastructure
Could lead to new digital divides

2. DIGITAL TRENDS  BIG DATA, IoT, 3D PRINTING, AUTOMATION, MOOCs
2. DIGITAL TRENDS

**BIG DATA:** Insurance for small scale farmers in Africa

**IoT:** Water Quality Monitoring in Bangladesh

**Automation:** Election Monitoring in Kenya with Ushahidi Platform

**MOOCs:** Kepler University in Kigali, Rwanda

**Digital trends** can potentially contribute to sustainable development.

**However,** development dimension must be prioritized for SDGs.

3D Printing can produce products in one process, without multitudes of parts, and with recycled materials.

**DECOUPLING**

**CARBON EMISSIONS FROM PRODUCTION**
2. DIGITAL TRENDS

Digital trends come with potential developmental benefits

**RISKS AND CHALLENGES OF DIGITAL TRENDS**

**DATA**

**PRIVACY & SECURITY:**
Big Data and IoT technologies can endanger consumer privacy and security and compromise confidentiality.

**DATA SHARING:**
Illegal sharing of 3D printed data can potentially pose risks for national security as well as economic sectors.

**REGULATION:**
Lack of regulatory standards for data interoperability may minimize potential benefits.

**PEOPLE**

**POTENTIAL JOB LOSS:**
Automation and MOOCs can potentially reduce need for labor in spite of rising productivity.

**HUMAN CAPITAL:**
Emerging digital trends require skilled labor to maximize benefits.

**DISCRIMINATION:**
Digital automation algorithms and big data analysis can potentially reinforce discriminatory biases.

**HUMAN CAPITAL:**

Digital trends come with potential risks and challenges.

HOWEVER, these digital trends come with potential risks and challenges.
Countries may consider foresight as policy tool.

Foresight can potentially shape funding and decision-making processes.

SINGAPORE TECH FORESIGHT ON AUTOMATION

Conducted study by Ctr. for Strategic Foresight and Min. of Manpower

- How will big data and automation affect jobs?

- Recommend incentivizing automation

- Recommend up-skilling citizens for future jobs

GOVERNMENTS MAY CONSIDER:

1. Developing institutional capacity for foresight.
2. Prioritizing foresight for S&T policy-making and relevant sectoral strategy.
3. Conducting foresight on technologies, even if they are not locally adopted.
4. Sharing relevant lessons through global platforms like CSTD.
Digital developments can be part of national development plans.

**HOWEVER,** without pro-poor focus the benefits are not likely to be inclusive.

**GOVERNMENTS MAY CONSIDER:**
- Developing capacity for digital development as "knowledge aid."
- Forging North-South and South-South partnerships to harness digital developments for the poor.
- Adapting free and open source digital technologies for locally-relevant, pro-poor applications.
- Supporting local innovators who create applications with an inclusive, pro-poor focus.

**GOVERNMENT CAN ENCOURAGE PARTICIPATION OF MILLENIALS.**

**GOVERNMENT CAN LINK POVERTY REDUCTION TO DIGITAL TRENDS.**
To maximize the developmental impact of digital trends, governments can consider the following:

**DATA REGULATION**
Ensure Privacy & Security and Encourage Innovation

**HUMAN CAPITAL**
Invest in Human Capital and Up-Skilling Workers.

**DIGITAL DIVIDE**
Continue to Bridge Digital Divides and Ensure Inclusive Access.
1: DIGITAL FORESIGHT
ICTs ARE IMPORTANT FOR ACHIEVING SDG’S AND TECHNOLOGY FORESIGHT CAN AID POLICYMAKING

2: DIGITAL TRENDS
BIG DATA, IoT, 3D PRINTING, AUTOMATION, & MOOCs PRESENT OPPORTUNITIES AND CHALLENGES FOR SDGs

3: DIGITAL POLICY
NATIONAL POLICIES CAN MAXIMIZE DEVELOPMENTAL IMPACTS AND MINIMIZE RISKS OF DIGITAL TRENDS

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