Some trends in digitalization and development

Geneva, 28 October 2019

Angel González Sanz
Division on Technology and Logistics
UNCTAD
What is the digital economy?

Figure 1.1. A representation of the digital economy

What do we know about the size and the scope of the digital economy?

**Global digital economy**

Estimates range from:

<table>
<thead>
<tr>
<th>Definition</th>
<th>Narrow</th>
<th>Broad</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrow</strong></td>
<td>4.5%</td>
<td>15.5%</td>
</tr>
<tr>
<td><strong>Broad</strong></td>
<td>4.5%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

In the **US** estimates range from:

<table>
<thead>
<tr>
<th>Definition</th>
<th>Narrow</th>
<th>Broad</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrow</strong></td>
<td>6.9%</td>
<td>21.6%</td>
</tr>
<tr>
<td><strong>Broad</strong></td>
<td>6.9%</td>
<td>21.6%</td>
</tr>
</tbody>
</table>

In the **China** they range from:

<table>
<thead>
<tr>
<th>Definition</th>
<th>Narrow</th>
<th>Broad</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Narrow</strong></td>
<td>6%</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Broad</strong></td>
<td>6%</td>
<td>30%</td>
</tr>
</tbody>
</table>

The evolving digital economy is closely associated with key frontier technologies that impact all SDGs.

- Internet of Things
- Data analytics
- Machine learning
- Artificial intelligence
- Automation & Robotics
- 3D printing
- Cloud computing
A classification of new technologies

• New enablers of digitalization
  • Smart sensors, wearables, GPS navigation, drones

• Optimizers of production processes
  • IoT, additive manufacturing, machine learning, data analytics, robots, remote operation, digital twins...

• Enhancers of the use of resources
  • New renewable energies, nanotech
Global Internet Protocol (IP) traffic, a proxy for data flows, has grown dramatically...

- 100 GB of traffic per day in 1992
- 100 GB per second in 2002
- 46,600 GB per second in 2017
- 150,700 GB per second in 2022

...but the world is only in the early days of the data-driven economy

Source: UNCTAD, based on data from Cisco.
Geography of the digital economy is highly concentrated in two countries: the US and China. 90% of the market capitalization value of the world’s 70 largest digital platforms is held in these two countries. 

Source: Holger Schmidt (https://www.netzoekonom.de/vortraege/#tab-id-1).
Geography of the digital economy is highly concentrated in two countries

US and China account for:

- 75% of all patents related to blockchain technologies
- 50% of global spending on IoT
- >75% of the cloud computing market

Source: UNCTAD, based on ACS, IDC and Cisco.
And there are still huge digital divides

Half of the world remains **offline**

In LDCs only **1 in 5** people is online

**Gender gap** is the widest in the poorest economies

Source: UNCTAD, based on ITU Statistics database.
DRIVERS AND IMPACT OF DIGITALIZATION
Trends driving digitalization of production

- Rapid technical change in various fields create opportunities for massive efficiency gains through combined application
- Falling prices of computing power
- Competitive pressures
- Opportunities to remove human error (safety), risks (environment),
- Reduction in the cost of experimenting with new products/processes
Impact on value creation

• Possibility to revive productivity growth

• Mixed effects
  • For example, robots can improve productivity and safety in industry, but reduce employment for less-skilled workers

• Inequality
  • Polarized labour market
  • Gender
  • Geography

• Context dependence
  • Technical feasibility does not equal economic viability
  • Technological capabilities define chances to benefit
### Potential impact of IoT, 2025

<table>
<thead>
<tr>
<th>Major applications</th>
<th>Low estimate</th>
<th>High estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring and managing illness, improving wellness</td>
<td></td>
<td>170–1,590</td>
</tr>
<tr>
<td>Energy management, safety and security, chore automation, usage-based design of appliances</td>
<td>200–350</td>
<td></td>
</tr>
<tr>
<td>Automated checkout, layout optimization, smart CRM, in-store personalized promotions, inventory shrinkage prevention</td>
<td>410–1,160</td>
<td></td>
</tr>
<tr>
<td>Organizational redesign and worker monitoring, augmented reality for training, energy monitoring, building security</td>
<td>70–150</td>
<td></td>
</tr>
<tr>
<td>Operations optimization, predictive maintenance, inventory optimization, health and safety</td>
<td>1,210–3,700</td>
<td></td>
</tr>
<tr>
<td>Operations optimization, equipment maintenance, health and safety, IoT-enabled R&amp;D</td>
<td>160–930</td>
<td></td>
</tr>
<tr>
<td>Condition-based maintenance, reduced insurance</td>
<td>210–740</td>
<td></td>
</tr>
<tr>
<td>Public safety and health, traffic control, resource management</td>
<td>930–1,660</td>
<td></td>
</tr>
<tr>
<td>Logistics routing, autonomous cars and trucks, navigation</td>
<td>560–850</td>
<td></td>
</tr>
</tbody>
</table>

$^1$ Includes sized applications only.

Note: Numbers may not sum due to rounding.
Digitalization cannot deliver without a functional NSI
Productive and innovative capabilities key for value creation and capture in the digital economy
Economic value of data arises once data are refined into digital intelligence that can be monetized.

Data value chain

- Collect
- Store
- Analyse
- Transform data into digital intelligence

Data monetization

- Selling targeted online advertising (e.g. Google, Facebook)
- Operating e-commerce platforms (Amazon, Alibaba, Uber, Airbnb)
- Transforming traditional goods into rentable services (Mobike, Rolls Royce)
- Renting out cloud services (Amazon Web Services, Tencent, MyJohnDeere)
Four dimensions to consider

- Distribution of value
- Scope of upgrading
- Governance of value creation
- Value creation vs. capture

Different actors to consider

- Individuals
- Small and large businesses
- Governments
- Economy-wide effects
New pathways for structural change
MEASURING VALUE IN THE DIGITAL ECONOMY
Measurement of the digital economy needs improvement

- Need for agreed definitions of value in the digital economy
- Need to collect official statistics

More needs to be done to make progress in measurement of the digital economy, especially to support developing countries in building statistical capacities to produce relevant information.
Growing importance of digitalization in the global economy

Digitally deliverable services exports in global services exports

- 2005: $1.2 trillion
- 2018: $2.9 trillion
- CAGR: +7%

Global ICT services exports

- 2005: $175 billion
- 2018: $568 billion
- CAGR: +9%

Global employment in the ICT sector

- 2010: 34 million
- 2015: 39 million
- CAGR: +13%

Source: UNCTAD.
VALUE CREATION AND CAPTURE IN THE DIGITAL ECONOMY: A GLOBAL PERSPECTIVE
Global digital platforms have achieved very strong market positions

Combined value of the platform companies with a market capitalization of >$100 million

Source: UNCTAD, based on Dutch Transformation Forum, and Evans and Gawer.

Top 7 platform companies in terms of market capitalization

- Microsoft
- Apple
- Amazon
- Alphabet
- Facebook
- Alibaba Group
- Tencent
Digital Economy is not Business as Usual

Sectoral shifts in a decade
- Technology and consumer services up from 16% to 56%.
- Oil, gas and mining down from 40% to 7%.
US and China giants capture large share in the global digital services market

Source: UNCTAD, based on The Economist, Internet Society and Digital Marketing China.
Factors explaining the rapid rise and consolidation of dominance

Network effects

Ability to extract, control and analyze data

High switching costs

Actions taken by platforms:

- Acquiring potential competitors
- Expanding into complementary products or services
- Investing strategically in research and development
- Lobbying in domestic and international policy-making
- Exploring strategic partnerships with traditional sectors
Growing power of digital platforms has global implications

- Market concentration
- Emergence of global data value chains
- Employment and online work
- Taxation
- Disruption of traditional sectors

Table IV.2. Facebook and Alphabet (Google) revenues, profits and taxes, 2017 ($ million and per cent)

<table>
<thead>
<tr>
<th></th>
<th>Foreign</th>
<th>United States</th>
<th>Total</th>
<th>Foreign share (per cent)</th>
<th>United States share (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facebook</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue ($ million)</td>
<td>22 919</td>
<td>17 734</td>
<td>40 663</td>
<td>66</td>
<td>44</td>
</tr>
<tr>
<td>Profits ($ million)</td>
<td>13 515</td>
<td>7 079</td>
<td>20 694</td>
<td>66</td>
<td>34</td>
</tr>
<tr>
<td>Share of revenue (per cent)</td>
<td>69</td>
<td>40</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxes (current) ($ million)</td>
<td>389</td>
<td>4 045</td>
<td>5 034</td>
<td>8</td>
<td>92</td>
</tr>
<tr>
<td>Share of profits (per cent)</td>
<td>2.9</td>
<td>65.6</td>
<td>24.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alphabet (Google)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue ($ million)</td>
<td>58 406</td>
<td>52 449</td>
<td>110 855</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>Profits ($ million)</td>
<td>16 500</td>
<td>10 700</td>
<td>27 193</td>
<td>61</td>
<td>39</td>
</tr>
<tr>
<td>Share of revenue (per cent)</td>
<td>28.2</td>
<td>20.4</td>
<td>24.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxes (current) ($ million)</td>
<td>1 746</td>
<td>12 608</td>
<td>14 354</td>
<td>12</td>
<td>88</td>
</tr>
<tr>
<td>Share of profits (per cent)</td>
<td>10.1</td>
<td>&gt;100</td>
<td>53.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Growing power of digital platforms has global implications: the case of advertising

Internet advertising share in the global advertising revenue

- 2010: 15%
- 2017: 38%
- 2023: 60%

Digital advertising spending more and more concentrated...

65% Digital advertising received by Google & Facebook in 2017

...leading to the erosion of advertising as a viable revenue source for other businesses

Amount spent on newspaper advertising in US

- 2000: $66 billion
- 2014: $24 billion
- 2023: $4 billion

Source: UNCTAD, based on Zenith advertising forecasts, Alphabet, Facebook, eMarketer.
The risk of subordinate positions of developing countries

Global digital platforms

Risk of subordinate positions of developing countries in global ‘data value chain’...

Providers of raw data

...While having to pay for the digital intelligence produced with those data.
OPPORTUNITIES
AND LIMITATIONS
IN DEVELOPING COUNTRIES
Digital economy offers a opportunities, especially for MSMEs...

By strengthening domestic productive capacity

More value can be captured in the digital economy

Main growth opportunities: enter a new product category or find market niches that globally operating platforms are unable or unwilling to address.

Small businesses can leverage global platforms, but only if they are accessible.
High concentration of innovation and entrepreneurship activity in all regions

Digital entrepreneurship in **Africa**

- 60% Egypt, Kenya, Nigeria and South Africa

Start-ups in **Asia**

- 58% China and India

In **Latin America**, leading start-up cities include:

- Mexico City
- Bogota
- Lima
- Sao Paulo
- Buenos Aires

Source: UNCTAD, based on Friederici et al. and Startup Genome 2017.
Digital entrepreneurship challenges in developing countries

- Limited demand
- Weak entrepreneurial knowledge and skills
- Lack of skilled workforce
- Shortage of finance

Innovation hubs can make important contributions but often fail to deliver. More attention now given to direct interventions, supplying promising startups with capital and networks.

Platforms in developing countries, and especially in Africa, cannot be as “physical-asset light” as their global counterparts.
POLICIES TO FACILITATE VALUE CREATION AND CAPTURE
New policies at national and international levels are needed to build an inclusive digital economy.

Technology is **not deterministic**. It creates both:

- **Opportunities**
- **Challenges**

**Policy makers need to make choices** that can help reverse...

...the trend towards widening inequalities and power imbalances.
It is up to governments in close dialogue with other stakeholders to set the rules of the game.
Need for new policies that can create a fairer distribution of gains

Digital divides
Differences in readiness
High concentration of market power

Need for new policies and regulations that can create a fairer distribution of gains
Policy areas that need particular attention

Strengthening the readiness of developing countries to engage in and benefit from e-commerce and the digital economy

Digital entrepreneurship and innovation policies, leveraging niche areas and domestic opportunities, including for women

Data policies for capturing value

Digitalization of MSMEs

Competition policies for the digital era

Labour market, skills and social protection policies

Intellectual property policies in the digital economy

Taxation of digital platforms

Development cooperation with more attention to the digital dimension

Intellectual property policies in the digital economy
New policies that are tailored to national objectives backed by more international support

Need for policy space for experimentation to assess the benefits and disadvantages of different options

National efforts in developing countries

Inclusive digital transformation

More International support
Discover the Digital Economy Report 2019

Follow us on:
- @ICT4DatUNCTAD
- #DigitalEconomyReport
Thank you!