Sharing & Communication Through The Ages

1. Cave Paintings
   Prehistoric, 30,000 BC
   - Who drew these cave paintings?
   - Created to communicate, they are incised, engraved, or painted with symbols.

2. Pictograms
   China & Egypt, 5000 BC
   - Ancient Egyptian hieroglyphs and Chinese characters.

3. Carrier Pigeons
   Greece, 776 BC
   - Symbolic expressions of the 5th Olympic Games.

4. First Postal Service
   Peru, 350 AD
   - Designed to communicate.

5. The Marathon Man
   Greece, 490 BC
   -技术创新 to communicate.

6. Heliographs
   Rome, 1790
   - Rome, Empire, Tiberius sent a personal message through a heliograph.

7. Paper
   China, 500 AD
   - Liu Shun wrote on a scroll with ink and paper.

8. Tunnels
   Great Wall & Suez
   - The tunnel was the longest road in the world.

9. Daily Newspaper
   Germany, 1605
   - The first daily newspaper was the "Mainzische Courant." It was published in Mainz.

10. Morse Code
    USA, 1837
    - Invented by Morse.

11. Telephone
    USA, 1876
    - Alexander Graham Bell.

12. First Transatlantic Signal
    Great Britain, 1945
    - Transatlantic telegraph.

13. 1st TV Broadcast
    USA, 1951
    - First broadcast.

14. ARPANET Launched
    USA, 1969
    - The first computer network.

15. WWW
    USA, 1990
    - The first web page.

16. ATM
    USA, 1974
    - Automated Teller Machine.

17. Blogging
    USA, 1994
    - The first blog was created.

18. Facebook
    USA, 2004
    - The first social network.

19. YouTube
    USA, 2005
    - The first video.

20. Twitter
    USA, 2006
    - The first tweet.

> Hello World! <
Internet usage keeps growing, but barriers lie ahead

Individuals using the Internet, 2005-2019*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of internet users (left axis)</th>
<th>Proportion of Internet users (right axis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>16.8 billion</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>18.4 billion</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>20.6 billion</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>23.1 billion</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>29.3 billion</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>34.8 billion</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>39.1 billion</td>
<td></td>
</tr>
<tr>
<td>2019*</td>
<td>53.6 billion</td>
<td></td>
</tr>
</tbody>
</table>

Note: *ITU estimate. Source: ITU.

An estimated 4.1 billion people are using the Internet in 2019, reflecting a 5.3 per cent increase compared with 2018.

Between 2005 and 2019, the number of Internet users grew on average by 10 per cent every year.
Most of the offline population lives in least developed countries!

### Percentage of individuals using the Internet, by region and development status, 2019*

<table>
<thead>
<tr>
<th>Region</th>
<th>Internet Usage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>82.5</td>
</tr>
<tr>
<td>The Americas</td>
<td>77.2</td>
</tr>
<tr>
<td>CIE</td>
<td>72.2</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>48.4</td>
</tr>
<tr>
<td>Arab States</td>
<td>51.6</td>
</tr>
<tr>
<td>Africa</td>
<td>28.2</td>
</tr>
<tr>
<td>World</td>
<td>53.6</td>
</tr>
<tr>
<td>Developed</td>
<td>86.6</td>
</tr>
<tr>
<td>Developing</td>
<td>47.0</td>
</tr>
<tr>
<td>LDCs</td>
<td>19.1</td>
</tr>
</tbody>
</table>

**Note:** *ITU estimate. Source:ITU.*

In developed countries, most people are online, with close to 87 per cent of individuals using the Internet.

In the least developed countries (LDCs), on the other hand, only 19 per cent of individuals are online in 2019.

Europe is the region with the highest Internet usage rates, Africa the region with the lowest Internet usage rates.
Percentage of the population not using the Internet, 2019*

The map of the offline population highlights regional differences in Internet usage.

Countries with the highest proportions of people not using the Internet are mostly in Africa and South Asia, although there are inter-regional differences.

Note: * ITU estimate.  Source: ITU.
The Internet Gap

• Globally 4.1 billion people are using the Internet.
  o 2 billion in developing countries

• For every user in the developed world there are two in the developing world.

• 4 billion people from developing world are offline.
  o 2/3 of the population of the developing countries.

• Around 20% of the 940 million people living in the least developed countries are online.
What causes the gap?

How can we bridge the gap?
Challenges

Technology

Solutions

Economics

Society
Meta Theme: Infrastructure
Solutions

MONSTER PROJECTS

COMMUNITY NETWORKS

INNOVATIVE ISPs
Meta Theme: Censorship

How Free Is the Internet?

Based on a study of internet freedom in 65 countries, covering 87 percent of the world’s internet users. The 2019 analysis focuses on developments that occurred between June 2018 and May 2019.

Source: Freedom House
Organization
Seminar Outline & Expectations

- **Choice**
  - Pick topic: 3 topics in order of preference email to course admins
  - Topic assignment: via mail and in Moodle
  - Opponent assignment: at the same time
- **Preparation**
  - Skim the papers and pick 3 – 4 for inclusion
  - Find additional resources (1 – 2 papers)
  - Check for relevant (recent) news articles or blogs
  - Synthesize your findings
Seminar Outline & Expectations (2)

• Feedback round
  o Short presentation on your material and the line of synthesis
  o Pick a unique time slot on a Doodle poll

• Final
  o Write-up: 6 – 8 pages double column format (10 – 11pt)
  o Deadline: end of June/beginning of July 2020
  o We will forward this to your “opponent"
  o Presentation with slides: 30min (max)
  o Participation in the discussion
  o Read one other student’s paper and prepare questions
  o Presentations: end of June/beginning of July 2020
Topics
Topics

1. Networking in remote areas
2. Localized networking
3. Education aspects
4. Economics and society
5. Censorship
6. Bridging the digital divide