Emerging Technologies and the Balance of Power

Arnaut Moreira
ESDC - IDN – Jun 2021
Agenda

1. Technologies and Power
2. Emerging Technologies in Cyberspace
3. Power Strategies
4. Final Remarks
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Technology and Power

June 1767: It started with some stones vs gunnery

But the success were the iron nails
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Some Current Trends in Cyberspace

Communications and Mobility

Internet of Things and Artificial Intelligence

Blockchain

Augmented Reality

Natural Interfaces

Quantum Computing
The Mobility Trend

DIGITAL AROUND THE WORLD IN JULY 2020
THE ESSENTIAL HEADLINE DATA YOU NEED TO UNDERSTAND MOBILE, INTERNET, AND SOCIAL MEDIA USE

TOTAL POPULATION: 7.79 BILLION
URBANISATION: 56%

UNIQUE MOBILE PHONE USERS: 5.15 BILLION
PENETRATION: 66%

INTERNET USERS: 4.57 BILLION
PENETRATION: 59%

ACTIVE SOCIAL MEDIA USERS: 3.96 BILLION
PENETRATION: 51%

SOURCES: KEPIOS ANALYSIS, UNITED NATIONS, LOCAL GOVERNMENT BODIES, GSMA INTELLIGENCE, ITU, GLOBALWEBINDEX, EUROSTAT, CNNIC, APBI; SOCIAL MEDIA PLATFORMS’ SELF-SERVICE ADVERTISING TOOLS; SOCIAL MEDIA COMPANIES’ ANNOUNCEMENTS AND EARNINGS REPORTS; MEDIASCORE; CAFEBAZAAR (ALL LATEST AVAILABLE DATA IN JULY 2020).

COMPATIBILITY ADVISORY: SOURCE AND BASE CHANGES. DATA MAY NOT BE DIRECTLY COMPARABLE TO PREVIOUS REPORTS.

https://datareportal.com/reports/digital-2020-july-global-statshot
Mobile Phones on the lead

**Share of Web Traffic by Device**

- **Mobile Phones**: 55.7% (Dec 2020 vs. Dec 2019: +4.6% or +244 BPS)
- **Laptops & Desktops**: 41.4% (Dec 2020 vs. Dec 2019: -5.8% or -253 BPS)
- **Tablet Computers**: 2.8% (Dec 2020 vs. Dec 2019: +3.3% or +9 BPS)
- **Other Devices**: 0.07% (Dec 2020 vs. Dec 2019: [UNCHANGED])

**Source**: StatCounter (Accessed Jan 2021). Figures represent each device's share of web pages served to web browsers only. Notes: Figures for device share are for December 2020. Annual change figures compare monthly share values for December 2020 to December 2019. Percentage change values represent relative change i.e. an increase of 2% from a starting value of 50% would equal 6%, not 70%. "BPS" values represent basis points, and indicate the absolute change in share values.

Visit: [https://www.slideshare.net/kepios/global-digital-statbites-001](https://www.slideshare.net/kepios/global-digital-statbites-001)
• 4G accommodate a few thousand IoT devices per square mile,
• 5G will provide connectivity for millions of devices per square mile.
• 4G networks have latency rates between 50-100 milliseconds,
• 5G would reduce that to just 1-4 milliseconds, a crucial difference when it comes to systems that need instantaneous reaction, such as autonomous vehicles and remote surgery.
In 2021 the number of connected devices exceeds already 50 billion
Artificial Intelligence

Ability of an object to take adequate decisions taking into account its changing environment. May involve “learning”.

The ability of a machine to perceive, evaluate, and act more quickly and accurately than a human represents a competitive advantage in any field—civilian or military.
For a public blockchain, the decision to add a transaction to the chain is made by consensus. This means that the majority of “nodes” (or computers in the network) must agree that the transaction is valid. The people who own the computers in the network are incentivised to verify transactions through rewards. This process is known as ‘proof of work’.

https://www.euromoney.com/learning/blockchain-explained/how-transactions-get-into-the-blockchain
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### Largest Companies by Market Value in 2020

The 100 largest companies in the world by market capitalization in 2020  
*(in billion U.S. dollars)*

<table>
<thead>
<tr>
<th>Ranking of the companies rank 1 to 100</th>
<th>Market capitalization in billion U.S. dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabian Oil Company (Saudi Aramco) (Saudi Arabia)</td>
<td>1,684.8</td>
</tr>
<tr>
<td>Microsoft (United States)</td>
<td>1,359</td>
</tr>
<tr>
<td>Apple (United States)</td>
<td>1,285.5</td>
</tr>
<tr>
<td>Amazon (United States)</td>
<td>1,233.4</td>
</tr>
<tr>
<td>Alphabet (United States)</td>
<td>919.3</td>
</tr>
<tr>
<td>Facebook (United States)</td>
<td>583.7</td>
</tr>
<tr>
<td>Alibaba (China)</td>
<td>545.4</td>
</tr>
<tr>
<td>Tencent Holdings (China)</td>
<td>509.7</td>
</tr>
<tr>
<td>Berkshire Hathaway (United States)</td>
<td>455.4</td>
</tr>
<tr>
<td>Johnson &amp; Johnson (United States)</td>
<td>395.3</td>
</tr>
<tr>
<td>Visa (United States)</td>
<td>383.9</td>
</tr>
<tr>
<td>Walmart (United States)</td>
<td>344.4</td>
</tr>
<tr>
<td>Nestlé (Switzerland)</td>
<td>304.1</td>
</tr>
</tbody>
</table>

Source
- Show sources informal
- Show publisher informal

Release date
- May 2020

Region
- Worldwide

Survey time period
- April 30, 2020

Supplementary notes
- Values are the closing prices outstanding on April 30, 2020.
5G Wars

The Huawei ban begins on May 15, 2019

On May 15, 2019, President Trump issued an executive order that bans the use of telecommunications equipment from foreign firms deemed a national security risk. The order itself doesn’t mention Huawei (or even China) specifically. However, the US Department of Commerce created what it refers to as an “Entity List” related to the order that does contain Huawei’s name.

Since the order didn’t reference Huawei specifically, its effect on the company and its various lines of business wasn’t totally clear. It appeared the order was mostly directed towards Huawei’s telecom operations, which would mean its wireless networking equipment, especially those related to 5G.
AI systems will also be used in the pursuit of power. We fear AI tools will be weapons of first resort in future conflicts.

China’s domestic use of AI is a chilling precedent for anyone around the world who cherishes individual liberty.
AI will enable new levels of performance and autonomy for weapon systems. But it also raises important legal, ethical, and strategic questions surrounding the use of lethal force.

Microelectronics power all AI, and the United States no longer manufactures the world’s most sophisticated chips.

The vast majority of cutting-edge chips are produced at a single plant separated by just 110 miles of water from our principal strategic competitor.
Distribution of rare earths production worldwide as of 2020:

- China: 57.57%
- United States: 15.63%
- Burma: 12.34%
- Australia: 6.99%
- Madagascar: 3.29%
- India: 1.23%
- Russia: 1.11%
- Thailand: 0.82%
- Brazil: 0.41%
- Vietnam: 0.41%
- Burundi: 0.21%
In late 2008 Satomi Nakamoto published *Bitcoin: A peer-to-peer electronic cash system.*

- **Banks and Governments had too much power.**
- **Let us create a cryptocurrency not controlled by central banks and Governments.**
- **We need “miners” to validate transactions and add blocks to the blockchain.**
- **Massive mining pools are now controlled by conglomerates.**
- **Mining activity becoming expensive for individuals.**
- **Complex calculations need powerful computing and this consumes electricity.**
Deng Xiaoping in the early 1980s, "If you open the window, both fresh air and flies will be blown in"

Content Censorship

Blocking Websites

Foreign Websites loading times
Baidu vs. Google: What's the Difference?

By SHOBHIT SETH | Updated Jun 25, 2019

Baidu vs. Google: An Overview

As Google (GOOGL) maintains its stronghold in the global internet search arena, Baidu, Inc., (BIDU) has the upper hand in China, with 74.6 percent of the nation's online search queries, as of February 2019. Google China, a subsidiary of Google, ranked a distant fifth in China’s online search market, with a 2.03 percent share.

Google China’s search engine was launched in 2006 and abruptly pulled from mainland China in 2010 amid a major hack of the company and disputes over censorship of search results.
“It turned out that, in general, both the authorities and telecom operators are ready to effectively respond to possible risks and threats and ensure the functioning of the Internet and the unified telecommunication network in Russia,” Sokolov says.

Read more at https://www.pravda.ru/news/politics/1461663-runet/
Russia Plans Its Own Version of Wikipedia by 2023

The project aims to attract three times as much traffic as Wikipedia.org.

Oct. 9, 2019

under 3 million Russian users visited Wikipedia.org every day in July 2019.
North Korea: Close every door

**JAN 2021 NORTH KOREA**

Essential headlines for digital adoption and growth. Changes to data sources mean values are not comparable with previous reports.

- **Total Population**: 25.83 million
  - Urbanisation: 62.5%
  - Annual change: +0.4% (+110 thousand)
- **Mobile Connections**: 4.76 million
  - Annual change: +5.4% (+243 thousand)
- **Internet Users**: [N/A] [INTERNET BLOCKED]
  - Annual change: [N/A]
- **Active Social Media Users**: [N/A] [INTERNET BLOCKED]
  - Annual change: [N/A]

**Sources**: The UN, local government bodies, GSMA Intelligence, Etisalat, Eurostat, China, AT&T, O2, CDH, social media platform self-service advertising tools and earnings reports, media reports, Carma Data, *Comparability Advisors*. Source change: Internet user numbers no longer incohere data. Avoided from social media platforms, so figures are not comparable with previous reports. *Notes*: Social media user numbers may not represent unique individuals, and may exceed internet user numbers.

https://www.slideshare.net/DataReportal/digital-2021-local-country-headlines-report-january-2021-v03
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Vulnerabilities will not disappear. They may increase.

The Internet creator’s never envisioned the need to provide Internet with reliable means for tracing the origin of a message.

Atribution – determining the source, location, and the identity of an attacker – is extremely difficult.

111 billion lines of new software code being produced each year — which introduces a massive number of vulnerabilities that can be exploited.
What about current technologies?

### Internet Growth Rankings: Relative Growth

Based on the year-on-year percentage change in internet users in countries/territories with populations over 50,000

<table>
<thead>
<tr>
<th>#</th>
<th>Greatest Relative Growth</th>
<th>▲ %</th>
<th>▲ Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Western Sahara</td>
<td>+364%</td>
<td>+102,000</td>
</tr>
<tr>
<td>02</td>
<td>Djibouti</td>
<td>+203%</td>
<td>+364,870</td>
</tr>
<tr>
<td>03</td>
<td>Tanzania</td>
<td>+173%</td>
<td>+14,560,898</td>
</tr>
<tr>
<td>04</td>
<td>Niger</td>
<td>+146%</td>
<td>+1,378,981</td>
</tr>
<tr>
<td>05</td>
<td>Afghanistan</td>
<td>+142%</td>
<td>+5,694,586</td>
</tr>
<tr>
<td>06</td>
<td>Côte d’Ivoire</td>
<td>+69%</td>
<td>+4,529,978</td>
</tr>
<tr>
<td>07</td>
<td>Ukraine</td>
<td>+60%</td>
<td>+15,325,054</td>
</tr>
<tr>
<td>08</td>
<td>Cambodia</td>
<td>+56%</td>
<td>+4,500,000</td>
</tr>
<tr>
<td>09</td>
<td>Rwanda</td>
<td>+50%</td>
<td>+1,875,322</td>
</tr>
<tr>
<td>10</td>
<td>Zambia</td>
<td>+40%</td>
<td>+2,056,489</td>
</tr>
<tr>
<td>11</td>
<td>Madagascar</td>
<td>+37%</td>
<td>+708,390</td>
</tr>
<tr>
<td>12</td>
<td>Timor-Leste</td>
<td>+37%</td>
<td>+150,000</td>
</tr>
<tr>
<td>13</td>
<td>Bolivia</td>
<td>+36%</td>
<td>+2,317,749</td>
</tr>
<tr>
<td>14</td>
<td>Comoros</td>
<td>+31%</td>
<td>+40,000</td>
</tr>
<tr>
<td>15</td>
<td>Iran</td>
<td>+29%</td>
<td>+16,241,877</td>
</tr>
<tr>
<td>16</td>
<td>Cuba</td>
<td>+27%</td>
<td>+1,270,796</td>
</tr>
<tr>
<td>17</td>
<td>Italy</td>
<td>+27%</td>
<td>+11,490,731</td>
</tr>
<tr>
<td>18</td>
<td>Guinea-Bissau</td>
<td>+25%</td>
<td>+30,000</td>
</tr>
<tr>
<td>18</td>
<td>North Korea</td>
<td>+25%</td>
<td>+4,000</td>
</tr>
<tr>
<td>18</td>
<td>Somalia</td>
<td>+25%</td>
<td>+300,000</td>
</tr>
</tbody>
</table>

**Sources:** InternetWorldStats, ITU, World Bank, CIA World Factbook, Eurostat, Local Government Bodies and Regulatory Authorities, MIDEASTMedia.Org, Reports in reputable media, Social Media Platform User Numbers. **Note:** Growth figures based on data in We Are Social & Hootsuite’s “Digital 2018” Reports.
Several years ago the Department of Homeland Security tried to force all federal agencies to secure their networks by tracking every connected device. As of December 2018, only 35 percent of required agencies had fully complied with this mandate ... As a result, most U.S. federal agencies still don’t know how many or what type of devices are connected to their networks (18Jul2019)
"Any society that would give up a little liberty to gain temporary security will deserve neither and will lose both."

Benjamin Franklin
1st Step – Google “Blog Arnaut”

2nd Step – Click “Geopolítica”

3rd Step – Look for “Conferências”
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