



EMERGING TRENDS AND GEOPOLITICAL CHALLENGES IN CYBER DIPLOMACY

Emerging Technologies and the Balance of Power

Arnaut Moreira

ESDC - IDN – Jun 2021

Agenda

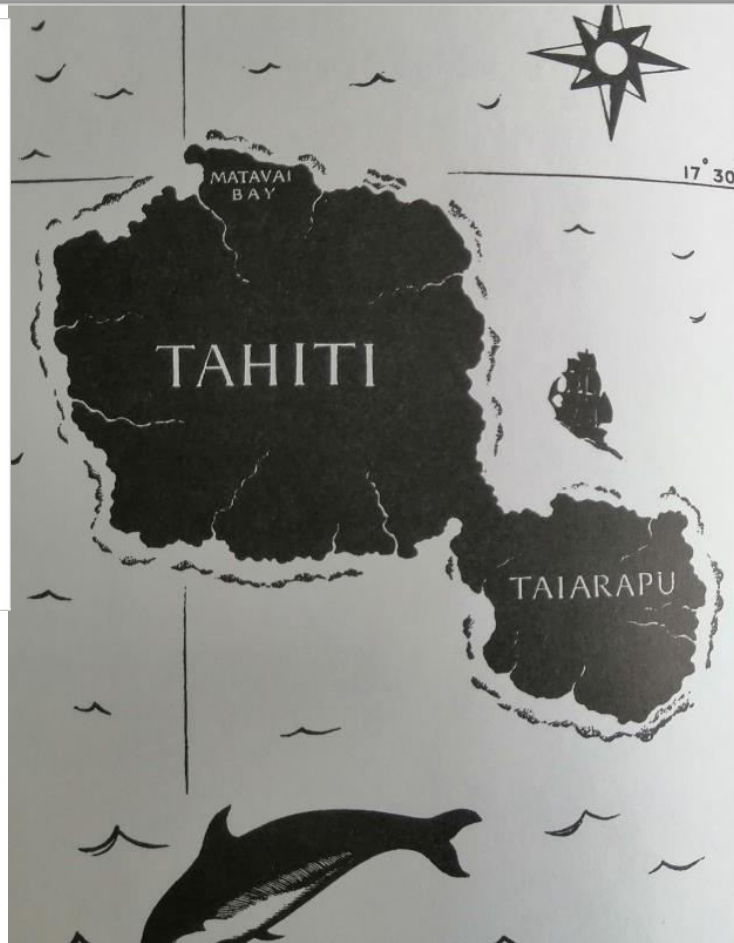
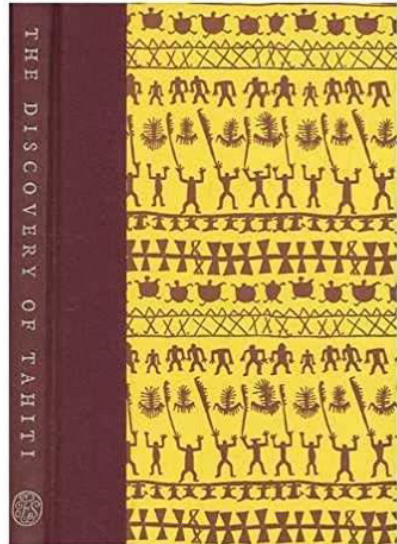
1. **Technologies and Power**
2. **Emerging Technologies in Cyberspace**
3. **Power Strategies**
4. **Final Remarks**

Agenda

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

Technology and Power

June 1767: It started with some stones vs gunnery



AN ACCOUNT OF THE DISCOVERY OF TAHITI

From the Journal of
GEORGE ROBERTSON
Master of H.M.S. Dolphin

Edited, with an Introduction by
OLIVER WARNER



With Wood Engravings by
ROBERT GIBBINGS

Printed for Men
THE FOLIO SC

But the success were the iron nails



Agenda

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

Some Current Trends in Cyberspace

Communications and Mobility

Internet of Things and Artificial Intelligence

Blockchain

Augmented Reality

Natural Interfaces

Quantum Computing

The Mobility Trend

**JUL
2020**

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%

7

SOURCES: KEPIOS ANALYSIS; UNITED NATIONS; LOCAL GOVERNMENT BODIES; GSMA INTELLIGENCE; ITU; GLOBALWEBINDEX; EUROSTAT; CNNIC; APIII; SOCIAL MEDIA PLATFORMS' SELF-SERVICE ADVERTISING TOOLS; SOCIAL MEDIA COMPANIES' ANNOUNCEMENTS AND EARNINGS REPORTS; MEDIASCOPE; CAFEBAZAAR (ALL LATEST AVAILABLE DATA IN JULY 2020).
♦ **COMPARABILITY ADVISORY:** SOURCE AND BASE CHANGES. DATA MAY NOT BE DIRECTLY COMPARABLE TO PREVIOUS REPORTS.

**we
are
social**



Hootsuite®

<https://datareportal.com/reports/digital-2020-july-global-statshot>

Mobile Phones on the lead

JAN
2021

SHARE OF WEB TRAFFIC BY DEVICE

EACH DEVICE'S SHARE OF TOTAL WEB PAGES SERVED TO WEB BROWSERS

⚠ THE FIGURES ON THIS CHART ARE BASED ON TRAFFIC TO WEB BROWSERS ONLY, AND DO NOT INCLUDE DATA FOR OTHER CONNECTED ACTIVITIES (E.G. USE OF NATIVE MOBILE APPS)

MOBILE
PHONES



55.7%

DEC 2020 vs. DEC 2019:

+4.6%

+244 BPS

LAPTOPS &
DESKTOPS



41.4%

DEC 2020 vs. DEC 2019:

-5.8%

-253 BPS

TABLET
COMPUTERS



2.8%

DEC 2020 vs. DEC 2019:

+3.3%

+9 BPS

OTHER
DEVICES



0.07%

DEC 2020 vs. DEC 2019:

[UNCHANGED]

55

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 (E.G. AN INCREASE OF 2.0% FROM A STARTING VALUE OF 50% WOULD EQUAL 52%, NOT 70%). "BPS" VALUES REPRESENT BASIS POINTS, AND INDICATE THE ABSOLUTE CHANGE IN SHARE VALUES.

we
are
social

Hootsuite

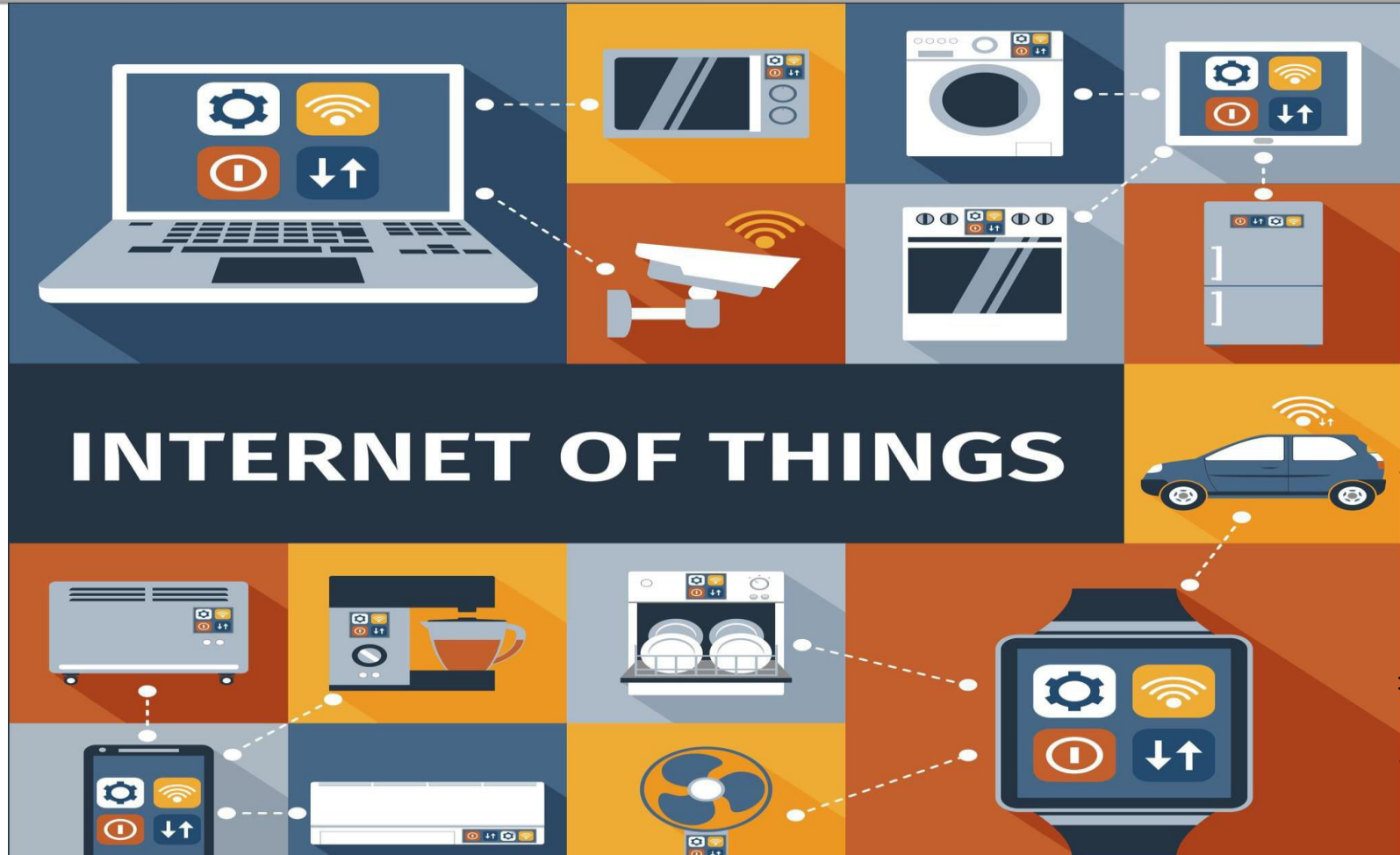
<https://www.slideshare.net/kepios/global-digital-statbites-001>

5G Revolution



- 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.

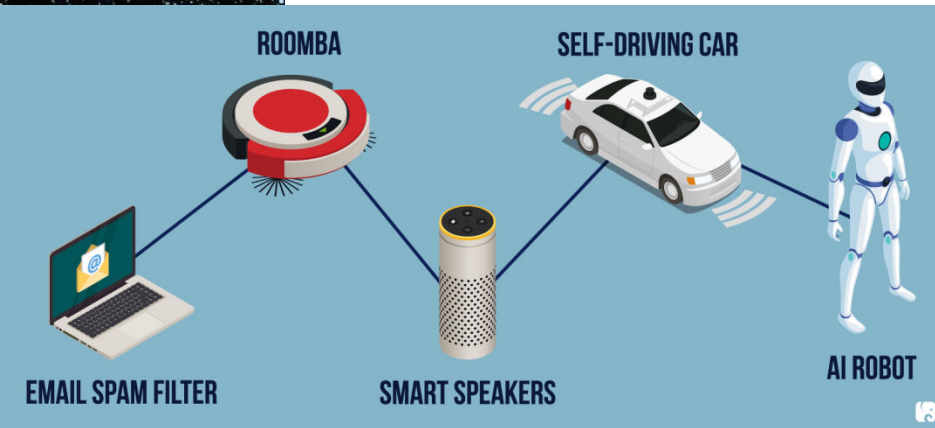
The IOT Trend



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”.

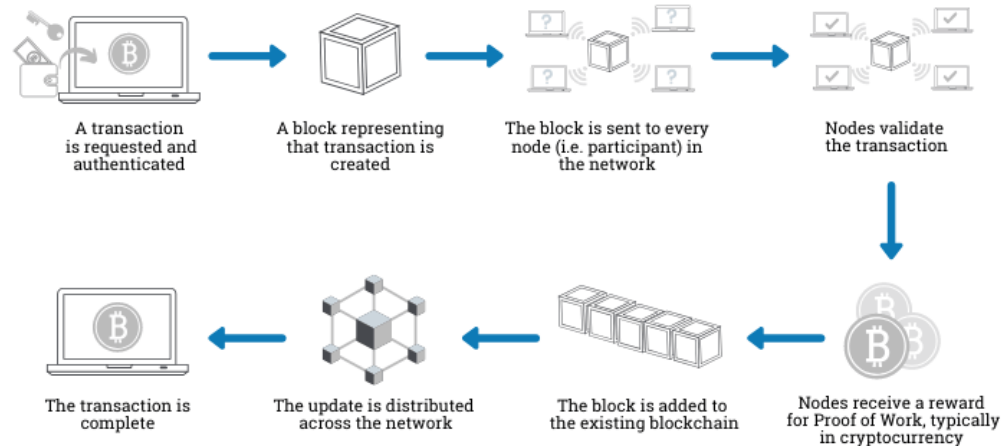


The ability of a machine to perceive, evaluate, and act more quickly and accurately than a human represents a competitive advantage in any field—civilian or military.

Blockchain

In Standard Databases “someone” is responsible for keeping it (and eventually can change the data)

How does a transaction get into the blockchain?



© Euromoney Learning 2020

<https://www.euromoney.com/learning/blockchain-explained/how-transactions-get-into-the-blockchain>

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’.

Agenda

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

Largest Companies by Market Value in 2020

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

Search:

Records: 13

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

Showing entries 1 to 13 (100 entries in total)

[Previous](#) [Next](#)

DOWNLOAD



Source

[→ Show sources informat](#)
[→ Show publisher inform](#)

Release date

May 2020

Region

Worldwide

Survey time period

April 30, 2020

Supplementary notes

Values are the closing price 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 Wars

Final Report

National Security Commission on Artificial Intelligence



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 Wars

Final Report

National Security Commission on Artificial Intelligence



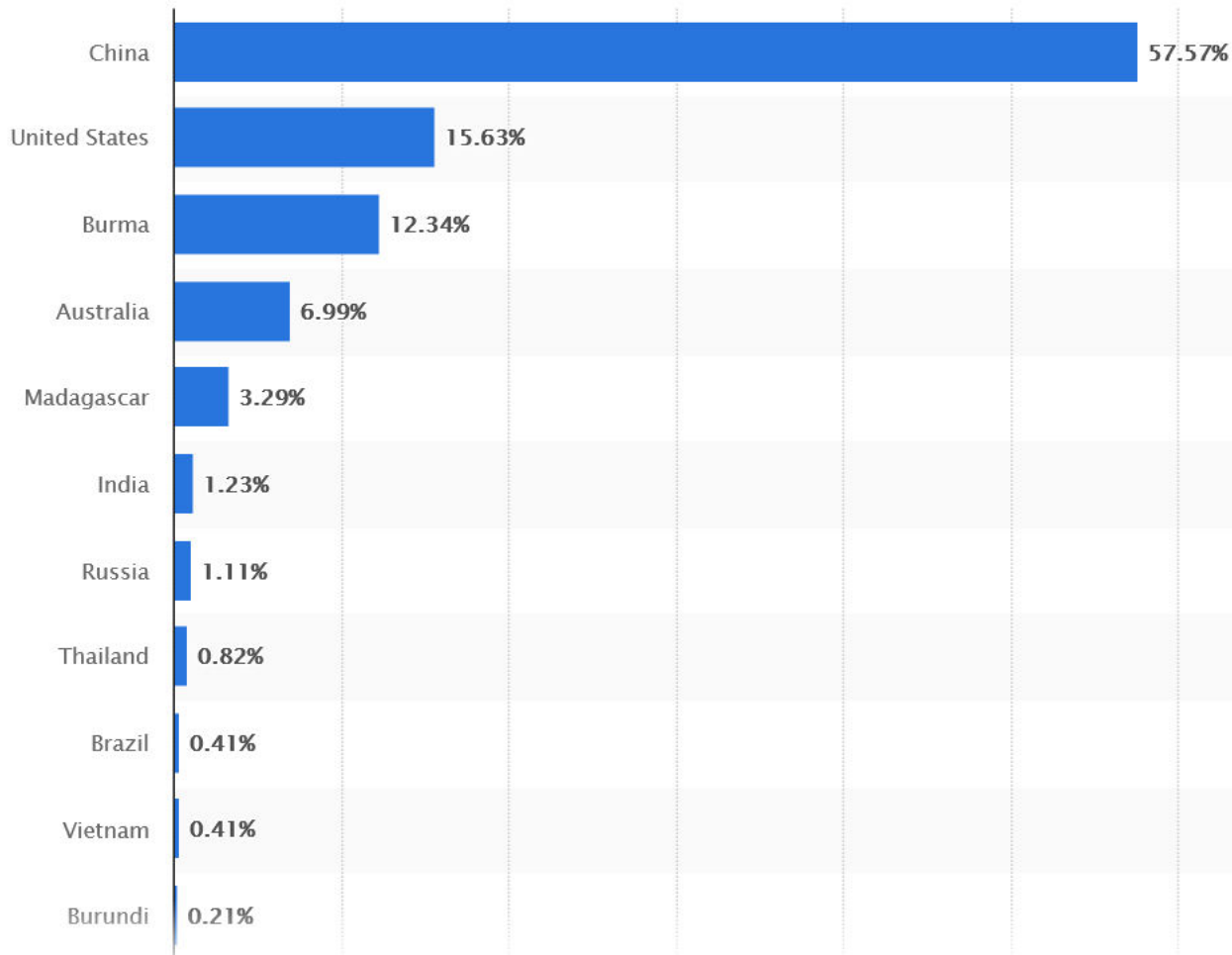
AI will enable new levels of performance and autonomy for weapon systems. But it also **raises important legal, ethical, and strategic questions surrounding the use of lethal force.**

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

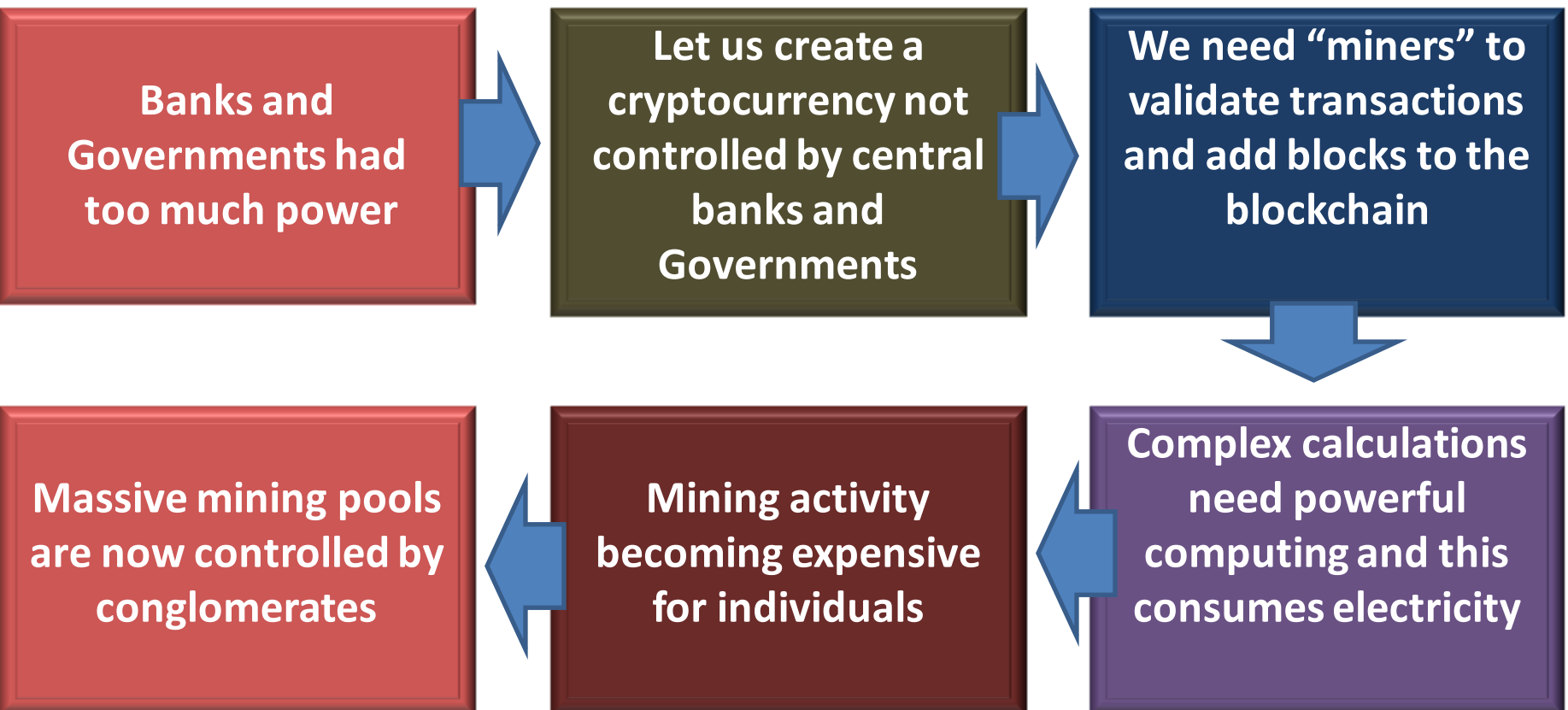
AI Wars

Distribution of rare earths production worldwide as of 2020,



Blockchain Wars and Mining trends

In late 2008 Satoshi Nakamoto published [Bitcoin: A peer-to-peer electronic cash system](#).



CHINA: The Great Firewall

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.

<https://www.technologyreview.com/2018/12/19/138307/how-google-took-on-china-and-lost/>

Russia: RUNET, a National Internet ?



23_12_2019

Новости

00:31 В Бейруте прошел митинг в память о геноциде армян

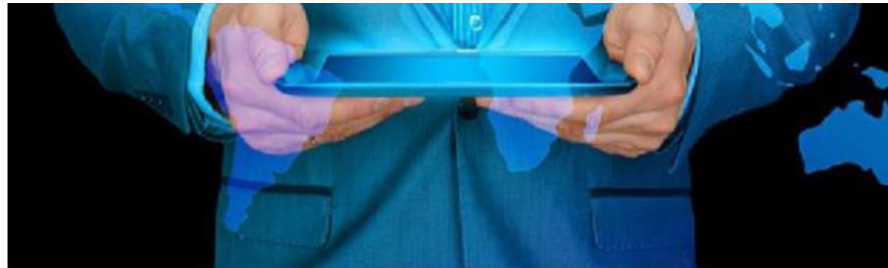
00:13 Четверо детей погибли в огне под Пермью

23:55 Захарова вспомнила чешского классика, комментируя ситуацию в Чехии

В России прошли первые учения по защите суверенного рунета

© 23.12.2019 20:54
ПОЛИТИКА

Сегодня, 23 декабря, прошли первые учения по защите российского сегмента интернета, сообщил заместитель главы Министерства цифрового развития, связи и массовых коммуникаций Алексей Соколов.



"Выяснилось, что в целом и органы власти, и операторы связи готовы эффективно реагировать на возможные риски и угрозы и обеспечивать функционирование сети интернет и единой сети электросвязи в России", — утверждает Соколов.

"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/>

Nationally Oriented Contents

The Moscow Times
INDEPENDENT NEWS FROM RUSSIA

≡ NEWS OPINION BUSINESS MEANWHILE ARTS AND LIFE PODCASTS VIDEOS IN-DEPTH

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



NORTH KOREA

TOTAL
POPULATION



**25.83
MILLION**

URBANISATION
62.5%

ANNUAL CHANGE
+0.4%
+110 THOUSAND

MOBILE
CONNECTIONS



**4.76
MILLION**

vs. POPULATION:
18.4%

ANNUAL CHANGE:
+5.4%
+243 THOUSAND

INTERNET
USERS



[N/A]
[INTERNET BLOCKED]

vs. POPULATION:
[N/A]

ANNUAL CHANGE:
[N/A]

ACTIVE SOCIAL
MEDIA USERS*



[N/A]
[INTERNET BLOCKED]

vs. POPULATION:
[N/A]

ANNUAL CHANGE:
[N/A]

we
are
social



Hootsuite

SOURCES: THE UNITED KINGDOM GOVERNMENT BODIES, GSMA INTELLIGENCE, ITU, OWI, EUROSTAT, CNNIC, ABS, OECD, SOCIAL MEDIA PLATFORMS' SELF-SERVICE ADVERTISING TOOLS AND DEARINGS REPORTS, MEDIA SCOPE, CANTABRAIA. **COMPARABILITY ADVISORS:** SOURCE CHANGES. INTERNET USER NUMBERS NO LONGER IN OUR DATA SOURCED FROM SOCIAL MEDIA PLATFORMS, SO FIGURES ARE NOT COMPARABLE WITH PREVIOUS REPORTS. **NOTE:** SOCIAL MEDIA USER NUMBERS MAY NOT REPRESENT UNIQUE INDIVIDUALS, AND MAY VARY IN TOTAL USER NUMBERS.

Agenda

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

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.

Attribution – 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.

<https://cybersecurityventures.com/hackerpocalypse-cybercrime-report-2016/>

<https://www.dcat.ch/sites/default/files/publications/documents/On%20Cyberwarfare-Schreier.pdf>

What about current technologies?

JAN
2019

INTERNET GROWTH RANKINGS: RELATIVE GROWTH

BASED ON THE YEAR-ON-YEAR PERCENTAGE CHANGE IN INTERNET USERS IN COUNTRIES / TERRITORIES WITH POPULATIONS OVER 50,000

#	GREATEST RELATIVE GROWTH	▲%	▲ USERS
01	WESTERN SAHARA	+364%	+102,000
02	DJIBOUTI	+203%	+364,870
03	TANZANIA	+173%	+14,560,898
04	NIGER	+146%	+1,378,981
05	AFGHANISTAN	+142%	+5,694,586
06	CÔTE D'IVOIRE	+69%	+4,529,978
07	UKRAINE	+60%	+15,325,054
08	CAMBODIA	+56%	+4,500,000
09	RWANDA	+50%	+1,875,322
10	ZAMBIA	+40%	+2,056,489

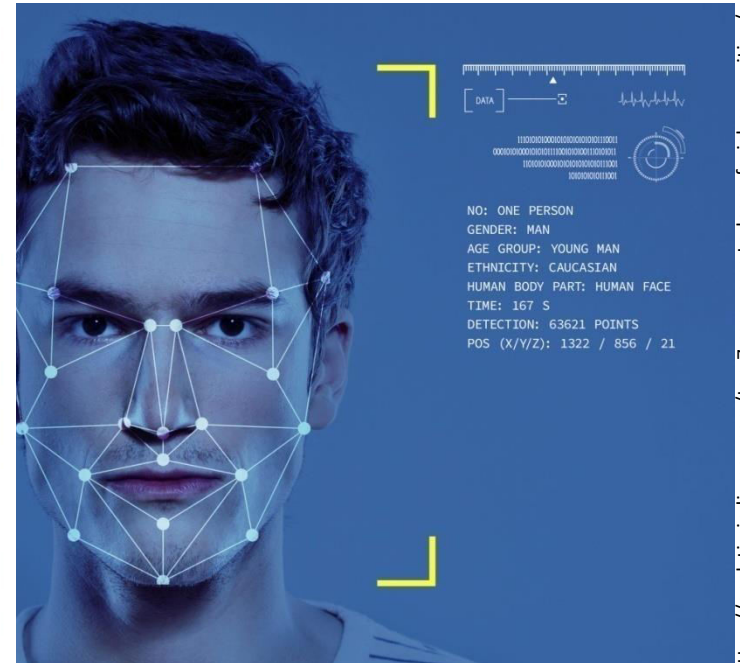
#	GREATEST RELATIVE GROWTH	▲%	▲ USERS
11	MADAGASCAR	+37%	+708,390
12	TIMOR-LESTE	+37%	+150,000
13	BOLIVIA	+36%	+2,317,749
14	COMOROS	+31%	+40,000
15	IRAN	+29%	+16,241,877
16	CUBA	+27%	+1,270,796
17	ITALY	+27%	+11,490,731
18=	GUINEA-BISSAU	+25%	+30,000
18=	NORTH KOREA	+25%	+4,000
18=	SOMALIA	+25%	+300,000

37

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.

Who controls the producers?

Banned Chinese Security Cameras Are Almost Impossible to Remove



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)**

<https://techcrunch.com/2019/05/03/china-smart-city-exposed/>



Benjamin Franklin

This Conference is on the Web

1st Step – Google “Blog Arnaut”



Blog Arnaut



2nd Step – Click “Geopolítica”

Quinta dos Arnaut

Uma quinta sobre a montanha

[Blog](#)

[Arboreto](#)

[Fauna](#)

[Contacto](#)

[Documentos](#)

[Geopolítica](#)

3rd Step – Look for “Conferências”

Conferências

2019_04_10 Universidade Nova: Uma Geopolítica Africana

Geopolítica de África v5

2019_04_03 Universidade Autónoma: O Crime Organizado Transnacional



EMERGING TRENDS AND GEOPOLITICAL CHALLENGES IN CYBER DIPLOMACY

Emerging Technologies and the Balance of Power

Arnaut Moreira

ESDC - IDN – Jun 2021