



EMERGING TRENDS AND GEOPOLITICAL CHALLENGES IN CYBER DIPLOMACY

Emerging Technologies and the Balance of Power

Arnaut Moreira

ESDC - IDN – Jan 2023

Brussels

Agenda

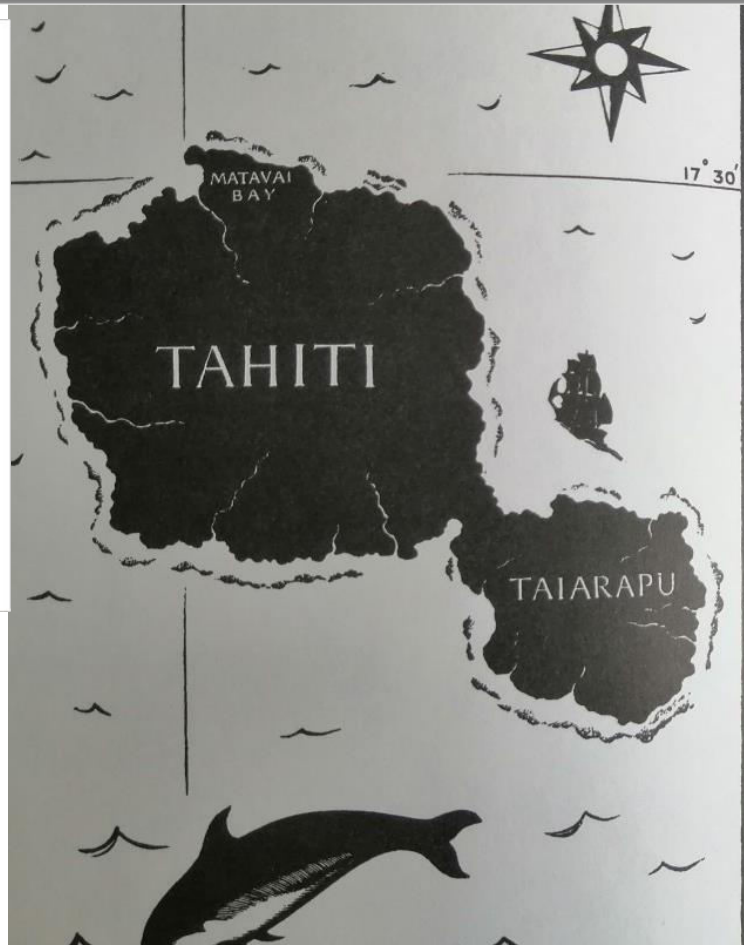
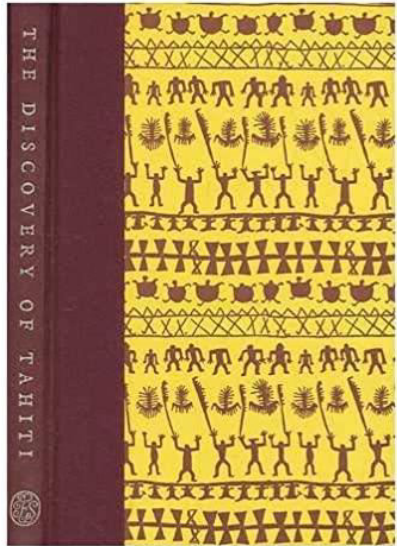
1. **Technologies and Power**
2. **Emerging Technologies in Cyberspace**
3. **Power Strategies**
4. **Final Remarks**

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 Digital World

JAN
2022

ESSENTIAL DIGITAL HEADLINES

OVERVIEW OF THE ADOPTION AND USE OF CONNECTED DEVICES AND SERVICES



TOTAL
POPULATION



we
are
social

7.91
BILLION

URBANISATION

57.0%

UNIQUE MOBILE
PHONE USERS



5.31
BILLION

vs. POPULATION

67.1%

INTERNET
USERS



4.95
BILLION

vs. POPULATION

62.5%

ACTIVE SOCIAL
MEDIA USERS



4.62
BILLION

vs. POPULATION

58.4%

SOURCES: UNITED NATIONS; U.S. CENSUS BUREAU; GOVERNMENT BODIES; GSMA INTELLIGENCE; ITU; GWI; EUROSTAT; CNNIC; ARIL; CIA WORLD FACTBOOK; COMPANY ADVERTISING RESOURCES AND EARNINGS REPORTS; OCBH; TECHRASA; KEPIOS ANALYSIS. **ADVISORY:** SOCIAL MEDIA USERS MAY NOT REPRESENT UNIQUE INDIVIDUALS. **COMPARABILITY:** SOURCE AND BASE CHANGES.

we
are
social

Hootsuite

Mobile Phones on the lead

JUL
2022

SHARE OF WEB TRAFFIC BY DEVICE

PERCENTAGE OF TOTAL WEB PAGES SERVED TO WEB BROWSERS RUNNING ON EACH KIND OF DEVICE



MOBILE
PHONES



59.72%

YEAR-ON-YEAR CHANGE

+7.9%

+437 BPS

LAPTOP AND
DESKTOP COMPUTERS



37.98%

YEAR-ON-YEAR CHANGE

-9.4%

-395 BPS

TABLET
DEVICES



2.27%

YEAR-ON-YEAR CHANGE

-14.0%

-37 BPS

OTHER
DEVICES



0.03%

YEAR-ON-YEAR CHANGE

-62.5%

-5 BPS

43

SOURCE: STATCOUNTER. **NOTES:** FIGURES REPRESENT THE NUMBER OF WEB PAGES SERVED TO BROWSERS RUNNING ON EACH TYPE OF DEVICE COMPARED WITH THE TOTAL NUMBER OF WEB PAGES SERVED TO BROWSERS RUNNING ON ANY DEVICE IN JUNE 2022. PERCENTAGE CHANGE VALUES REPRESENT RELATIVE CHANGE (I.E. AN INCREASE OF 20% FROM A STARTING VALUE OF 50% WOULD EQUAL 60%, NOT 70%). "BPS" VALUES REPRESENT BASIS POINTS, AND INDICATE THE ABSOLUTE CHANGE. FIGURES MAY NOT SUM TO 100% DUE TO ROUNDING.

**we
are
social**

Hootsuite®

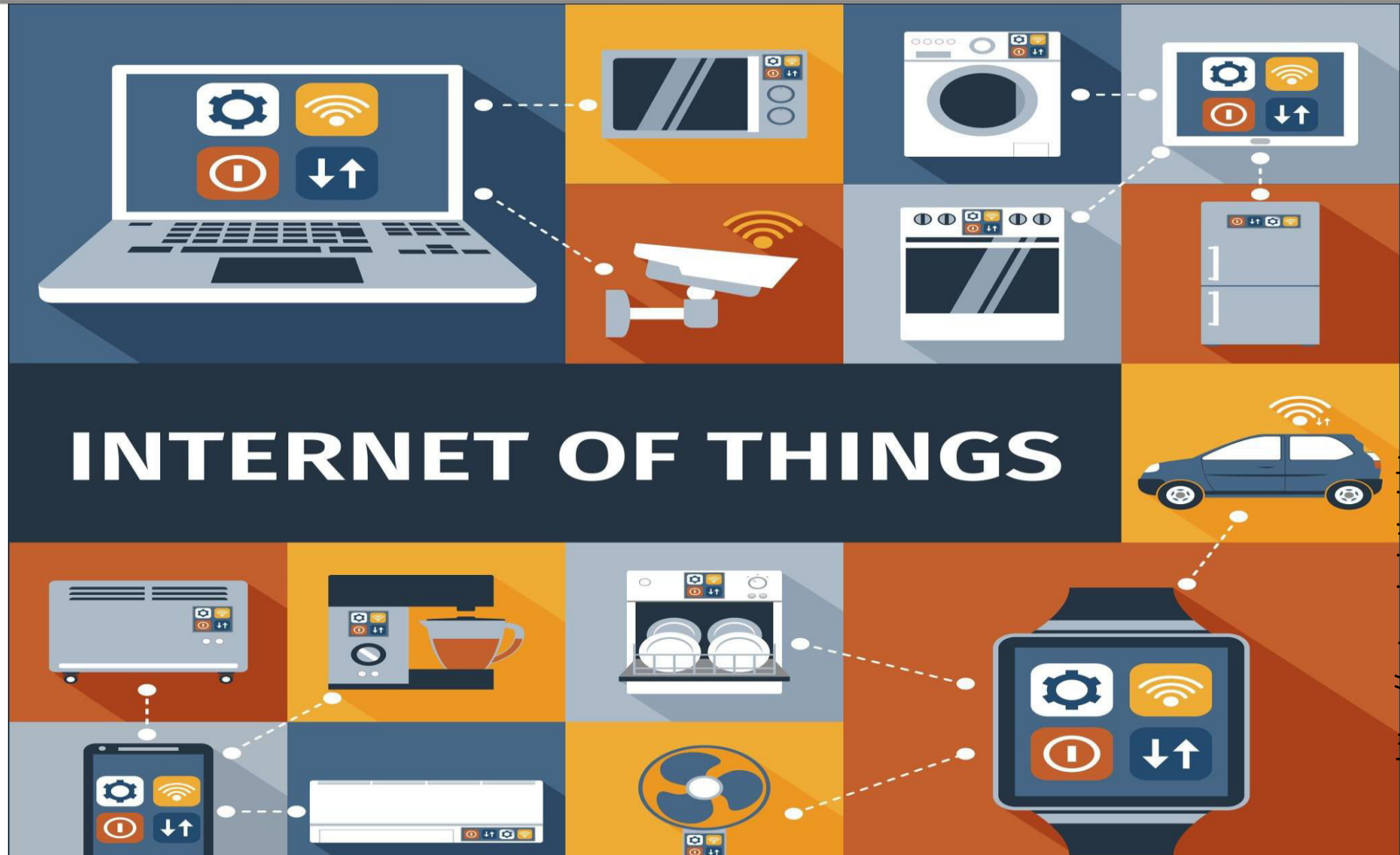
<https://datareportal.com/reports/digital-2022-july-global-statshot>

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.

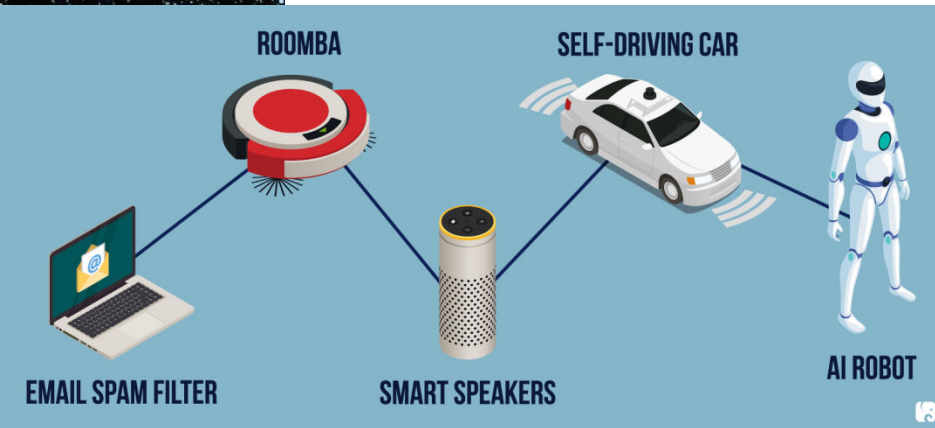
The IOT Trend



2023: 50 billion connected devices
What is the security of a gadget ?

Artificial Intelligence

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

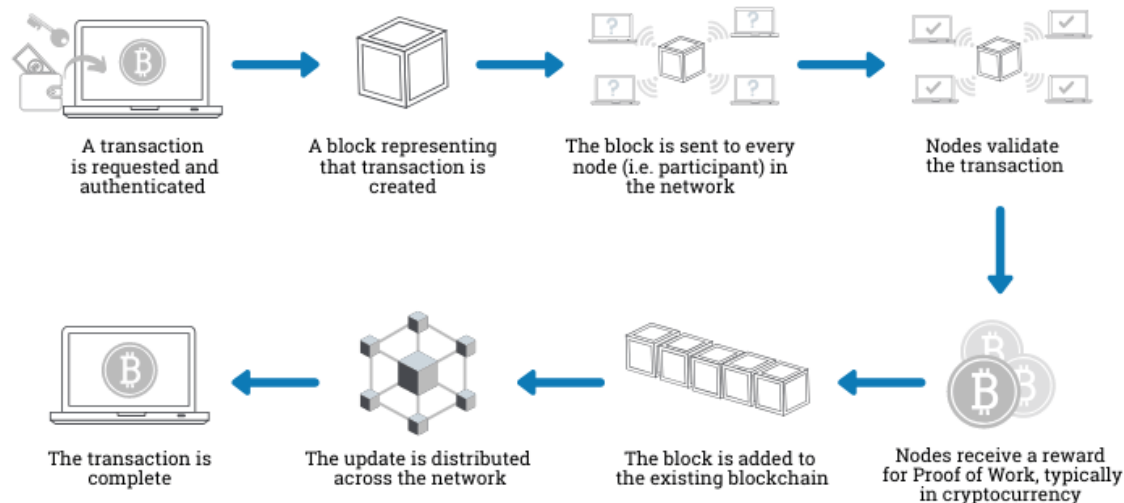


The ability of a machine to perceive, evaluate, and act more quickly and accurately than a human represents a competitive advantage in any field—civilian or military.

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 incentivized 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 2023

Rank	Name	Market Cap	Price	Today	Price (30 days)	Country
1	 Apple AAPL	\$2.143 T	\$134.76	▲ 1.01%		 USA
2	 Saudi Aramco 2222.SR	\$1.881 T	\$8.55	▼ 0.16%		 S. Arabia
3	 Microsoft MSFT	\$1.783 T	\$239.23	▲ 0.30%		 USA
4	 Alphabet (Google) GOOG	\$1.195 T	\$92.80	▲ 0.97%		 USA
5	 Amazon AMZN	\$1.000 T	\$98.12	▲ 2.99%		 USA
6	 Berkshire Hathaway BRK-B	\$700.57 B	\$317.64	▼ 0.40%		 USA
7	 Visa V	\$472.35 B	\$223.06	▼ 0.25%		 USA
▲2 8	 Exxon Mobil XOM	\$465.98 B	\$113.15	▼ 0.06%		 USA
▼1 9	 Tencent TCEHY	\$458.31 B	\$47.80	▲ 2.85%		 China
▼1 10	 UnitedHealth UNH	\$457.42 B	\$489.57	▼ 1.23%		 USA

<https://companiesmarketcap.com/>

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



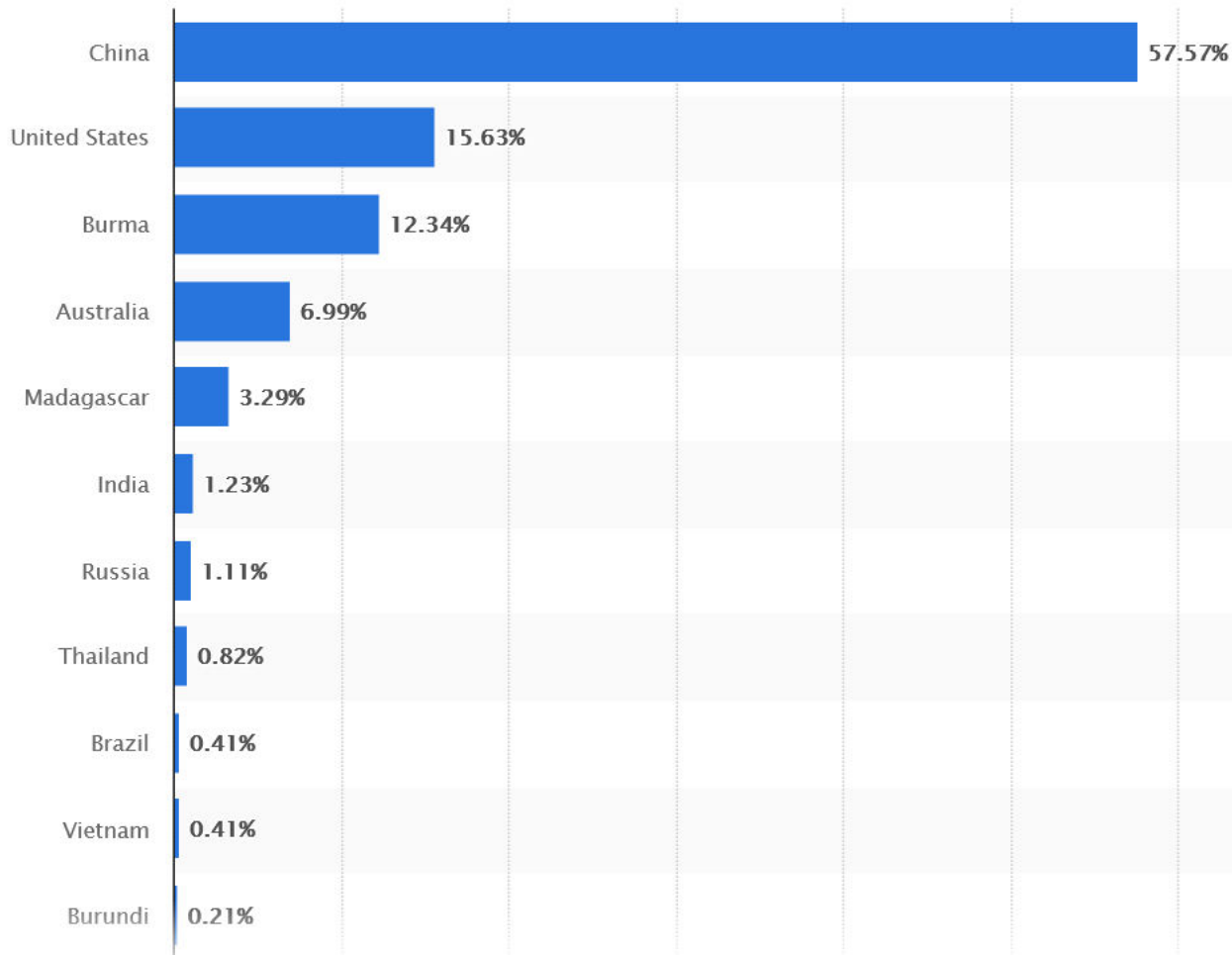
AI will enable new levels of performance and autonomy for weapon systems. But it also **raises important legal, ethical, and strategic questions surrounding the use of lethal force.**

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

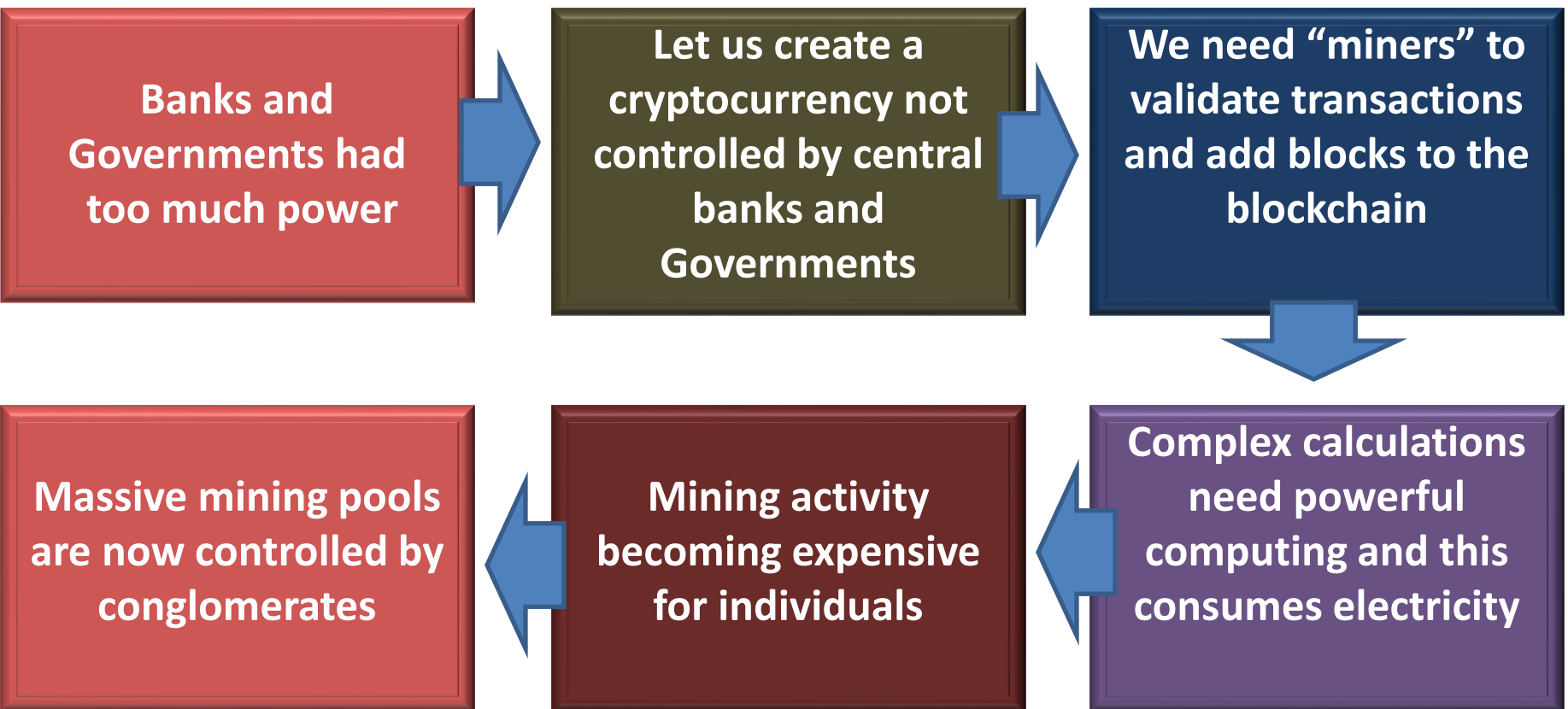
Distribution of rare earths production worldwide as of 2020,



<https://www.statista.com/statistics/270277/mining-of-rare-earth-by-country/>

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/>

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

K
OF
K

123

SOURCES: THE U.N. LOCAL GOVERNMENT BODIES, GSMA INTELLIGENCE, ITU, OWI, EUROSTAT, CNNFC, ABS, OECD, SOCIAL MEDIA PLATFORMS' SELF-SERVICE ADVERTISING TOOLS AND DEARINGS REPORTS, MEDIA SCOPE, CARIBAZAAR. **COMPARABILITY ADVISORY:** SOURCE CHANGES. INTERNET USER NUMBERS NO LONGER IN GUIDE 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.

we
are
social

Hootsuite

<https://www.slideshare.net/DataReportal/digital-2021-local-country-headlines-report-january-2021-v03>

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.

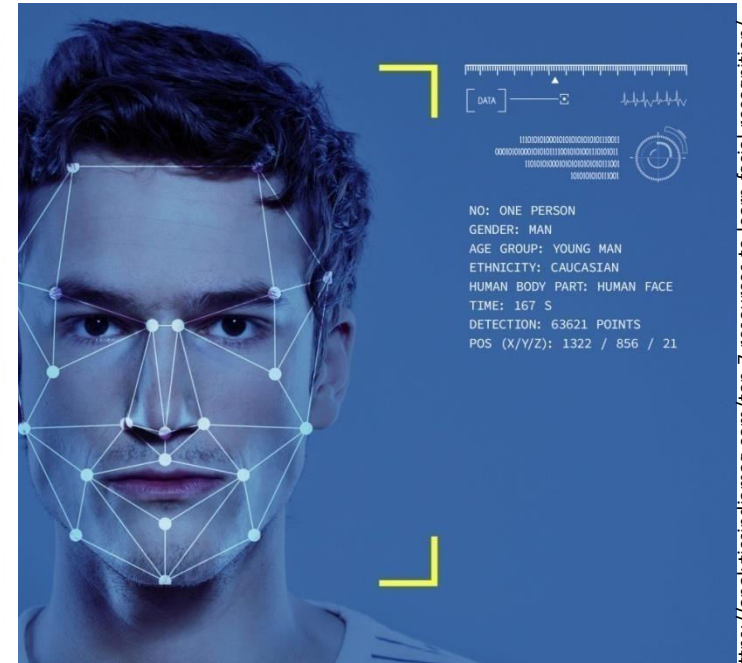
<https://cybersecurityventures.com/hackerpocalypse-cybercrime-report-2016/>

Who controls the producers?

Banned Chinese Security Cameras Are Almost Impossible to Remove



Source: Bloomberg



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 – Jan 2023

Brussels