Blurring boundaries: an analysis of the digital platforms-military nexus

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Outline

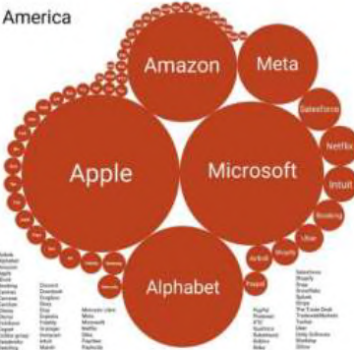# Background

- Large digital platforms - i.e., 'Big Tech' - as key drivers of structural change in contemporary capitalism:

- Unprecedented concentration of techno-economic power (e.g., Vasudevan, 2022; Coveri et al., 2022) → market capitalization larger than the GDP of countries like Japan (Alphabet, Amazon and Meta: $3 trillion market value as of April 2023)

- Reshaping the operation of knowledge and innovation networks/ecosystems (e.g., Gawer and Cusumano, 2014; Jacobides et al., 2024) → strengthened rather than challenged by innovation-based competition (Kurz, 2023)

- Surveillance-based business model (Zuboff, 2019) challenging the very conceptualization of the firm (Pitelis, 2022)

- Exacerbating the process of labor fragmentation (Cirillo et al., 2023) - e.g -, increasing inequalities (Schor and Vallas, 2020)

Stylized facts: a polarized platform world
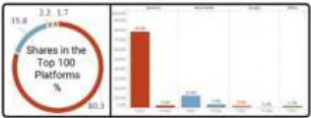
Stylized facts: market capitalization (2023)

Market capitalization in billion U.S. dollars

Company	Market capitalization (billion U.S. dollars)
Apple	2,792
Microsoft	2,399
Alphabet (Google)	1,642
Amazon	1,374
Nvidia	1,136
Tesla	757.3
Meta Platforms (Facebook)	734.6
TSMC	482.9
Tencent	389.7
Broadcom	351.5
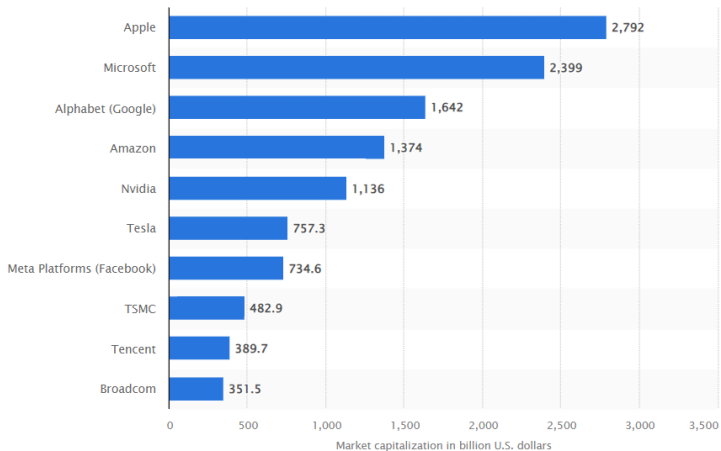
Stylized facts: online advertisement spending (UNCTAD, 2021)

Figure I.14. Digital advertising spending, 2012–2022

a) Digital advertising spending and share in total media advertising spending

b) Digital advertising spending by top digital platforms and their share in total digital advertising spending

Source: UNCTAD, based on data from eMarketer, Global Digital Ad Spending Update Q2 2020, available at www.emarketer.com/content/global-digital-ad-spending-update-q2-2020.
Note: 2020 to 2022 are estimates.

Stylized facts: concentration of technological power, start-up acquisition (UNCTAD, 2021)

Figure I.21 Number of acquisitions of AI start-ups, top ten acquirers, 2016–2021

Country of origin: United States China
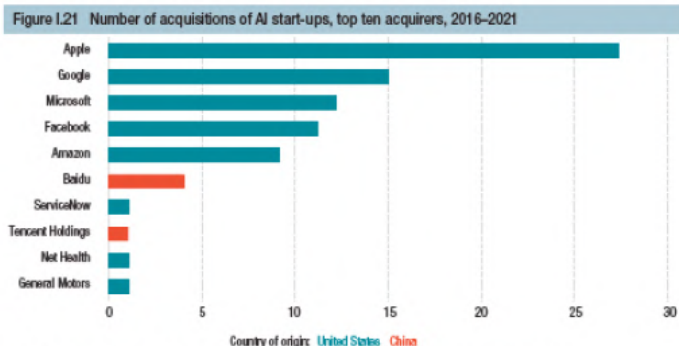
Source: UNCTAD, based on CBInsights, available at www.cbinsights.com (accessed 22 January 2021).

Stylized facts: concentration of technological power, share of global AI patents (Lexis, 2023)
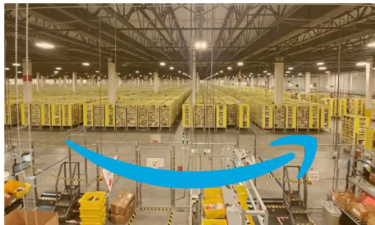

	2017	2021
Tencent 🇨🇳	711	9,614
Baidu 百度 🇨🇳	1,134	9,504
IBM 🇺🇸	2,921	7,343
SAMSUNG 🇰🇷	3,313	6,885
PING AN 🇨🇳	46	6,410
Microsoft 🇺🇸	4,373	5,821
Alphabet 🇺🇸	2,033	4,068
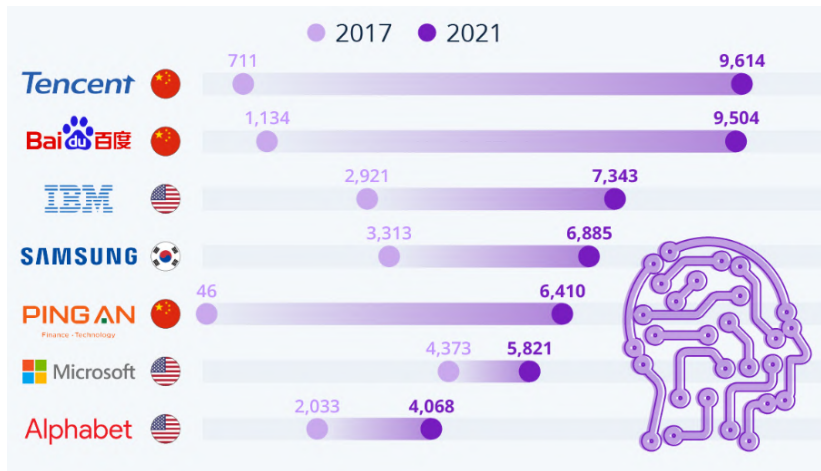
Stylized facts: the 'privatization' of knowledge (Rikap and Lundvall, 2021)

Table 3.2 Selected tech giants' top co-authors (2014–2019)

Microsoft	Google	Amazon	Tencent	Alibaba
University of California	University of California	University of California	Chinese acad of science	University of Science and Technology of China
University of Washington	Stanford University	Microsoft	Chinese University of Hong Kong	Chinese acad of science
University of Sci & Tech of China	Microsoft	University of Washington	Tsinghua University	Zhejiang University
MIT	MIT	Google	Peking University	Tsinghua University
Tsinghua University	Harvard	IBM	Shanghai Jiao Tong University	Peking University
University of London	Carnegie Mellon University	Georgia Inst of Technology	Sun Yat-sen University	Shanghai Jiao Tong University
Carnegie Mellon University	University of Illinois	Carnegie Mellon University	Zhejiang University	Microsoft
Google	University of Washington	University of Texas	Harbin Institute of Technology	Fudan University
Stanford University	IBM	MIT	Beihang University	Nanyang Technological University
ETH Zurich	New York University	Indian Inst of Technology	Nanyang Technological University	Nanjing University

Source Authors' analysis based on Web of Science

Stylized facts: digital platforms and labor fragmentation

This work: assessing the emerging digital-military complex

- ▶ A crucial and yet under-investigated driver of digital platforms power concerns the mutual dependency linking them to governments and, in particular, their military apparatus → bringing back to the fore forgotten traditions of economic thought: Imperialism (Hobson, 1902; Hilferding, 1910; Lenin, 1917) and Monopoly Capital theories (Baran & Sweezy, 1966 and their followers)

- ▶ Our contribution: bridging Imperialism, MC tradition and the more recent literature analysing platforms and the origins of their power (e.g., Conyon et al., 2022) to investigate the digital-military complex

- ▶ Focusing on the US to provide evidence on: i) growing relevance of platforms as contractors of the Department of Defence (DoD); ii) platforms as *dominus* of military critical technologies/infrastructures; iii) 'revolving doors' linking platforms' boards and the military and security apparatuses; iv) active role platforms in warfare scenarios, with particular reference to the Russia-Ukraine conflict.

The digital-military complex: where are we?

The Intercept_

OPENAI QUIETLY DELETES BAN ON USING CHATGPT FOR "MILITARY AND WARFARE"

The Pentagon has its eye on the leading AI company, which this week softened its ban on military use.

OpenAI logo displayed on a mobile phone screen in front of computer screen on Sept. 5, 2023 in Ankara, Turkey. Photo: Didem Mente/Anadolu Agency via Getty Images

Imperialism and the 'economic roots' of war

- ▶ **Violence and conflicts** as a 'natural outcome' of nation states' activities supporting corporations (Hobson, 1902): i) opening up new markets and seizing raw material sources ii) securing trade routes and key logistics hubs iii) preventing competitors (as well as subordinate allies) from gaining technological or trade-related competitive advantages iv) countering the reactions of those (e.g., foreign governments, trade unions) resisting corporations' expansions.

- ▶ **Not an harmonious division of roles** aimed at ensuring peace and freedom, as suggested by liberal thinkers and neoclassical economists, but an 'alliance' in which the violence of the State and its hegemonic ambitions (Arrighi, 1981) are intertwined with the profit-maximization strategies of the monopolistic firm (Vasudevan, 2021)

Enters the Monopoly Capital theory

- ▶ TNCs as the the 'hubs' orchestrating the allocation of capital, domestically and internationally, giving rise to new forms of subordination and dependence (Hymer, 1960; Baran and Sweezy, 1966).

- ▶ The *loci* where a large share of techno-organizational capabilities and innovations are developed, representing a key component of the emerging National Systems of Innovation (NSI) (Freeman, 1995).

- ▶ Yet, as global interconnectedness increases the sources of instability multiply: i) public demand as a key source of reproduction and accumulation, particularly during downswings ii) science, R&D, and public procurement, a significant share of which stems from the military sector, as a fundamental push for TNCs innovation and growth iii) growing complexity may turn into a misalignment of interests and conflicts (e.g., regulations and 'retaliatory strategies')

Monopoly Capital at the times of digital platforms (1)

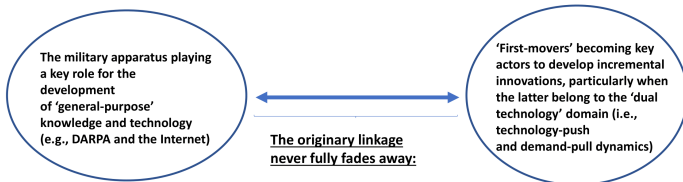|	XX century's TC	Digital platforms
Capitalistic phase	Managerial	Neoliberal
Dominant sector	Manufacturing	Services
Strategic objectives	Controlling the economic space by expanding physical assets and (to a lower extent) immaterial ones (e.g., patents, trademarks)	Controlling the economic space by expanding (selectively) physical assets and (extensively) immaterial (e.g., patents, trademarks) ones plus monopolizing data and data-related infrastructures
Growth drivers	Supply-side economies of scale	Demand-side economies of scale: network effects, scope economies and lock-in effects
Capital structure	Concentration and centralization	Centralization without concentration
Corporate governance	High profits and dividend payout ratio, FDIs	Relatively low profits/revenues ratio, shareholder buyback, selective investments to control data-related infrastructures
Internationalization strategies	Massive FDIs, directly exercised hierarchical control along SCs, centralization of R&D	FDI 'lightness', externalization and indirect control over formally independent economic actors, dominance over the innovation ecosystem
Control over the labor force	Taylorism/Toyotism	Digital Taylorism
Control over demand flows	Marketing and advertisment strategies	Targeted ads, 'anticipation' of demand flows, induced behavior
Control over governments	Lobbying activity, retaliatory power (e.g., threat to offshore activities and employment)	Retaliatory power magnified by the control of data and strategic infrastructures (e.g., active role in military strategies)

Monopoly Capital at the times of digital platforms (2)

- As the Internet becomes global, platforms magnify their ability to control data, digital technologies and related infrastructures (Rikap et al., 2021), as well as the new media where a large share of the public opinion is formed (Culpepper and Thelen, 2020)

- Platforms as indispensable partners to produce public goods, both in the civilian and military spheres → blurring public-private boundaries, providing platforms with an 'infrastructural status' that can make them indistinguishable from public operators

- Control of dual technologies in security and defence-sensitive domains such as facial recognition, turn platforms into governments' 'eyes and hears', at home as well as abroad

Disentangling the digital-military complex (1)

★ The 'originary linkage' binding military apparatus and digital platforms:

▶ Platforms dominating the Internet economy (i.e., Big Tech) owe their emergence to military projects (i.e., DARPA) supporting the development of basic knowledge and technologies and, no less importantly, favouring technology transfer (Mowery, 2010; O'Mara, 2020).

▶ A 'pendulum-like' relationship: the originary linkage never fades away completely, even when corporate R&D become mostly oriented towards private demand and civil purposes → military apparatuses continue to have an active role, affecting the evolutionary trajectory of products and technologies via, for example, military patents (Schmid, 2018)...institutions and procedures working as an 'always-open backdoor' for military apparatuses to monitor and, if needed, affect corporations' strategies are systematically established.

Disentangling the digital-military complex (2)

The 'pendulum-like' relationship

The military apparatus playing a key role for the development of 'general-purpose' knowledge and technology (e.g., DARPA and the Internet)

⟷

'First-movers' becoming key actors to develop incremental innovations, particularly when the latter belong to the 'dual technology' domain (i.e., technology-push and demand-pull dynamics)

The originary linkage never fully fades away:

- **Public R&D is needed to achieve radical breaktroughs**
- **'Backdoors' to encourage convergence of strategies when strategic needs emerge**
- **Military patents**

Disentangling the digital-military complex (3)

★ Knowledge, technology and critical infrastructures:

▶ Platforms monopolize key assets (e.g., cloud, submarine cables), hold the majoritarian share of digital patents (Fanti et al., 2022) and are the loci where most of the formal and tacit knowledge is developed (Rikap et al., 2021)

▶ Military operations involving the creation of a new surveillance system, access to sensitive information, protection from a cyberattack, deployment of a satellite system in remote, high-risk areas can hardly be realised without the cooperation of platforms

▶ Platforms' idiosyncratic competencies are key given their tacit and cumulative nature → as digital infrastructures grow in terms of size and relevance (e.g., increasing the mass of information stored and processed), the efficiency of embedded technologies (e.g., machine learning (ML) algorithms) and the uniqueness ('black-boxishness') of corporation-specific competencies increase too...

Disentangling the digital-military complex (4)

- Pivotal role in both civil and military innovation ecosystems (Jacobides et al., 2024) → governing knowledge co-creation processes and exploiting the modular structure of digital ecosystems, benefiting from the decentralized nature of digital innovation while preserving their economic and technological power.

- Attracting top skills: in frontier fields such as Big Data, AI, or Quantum Computing there is no match between Big Tech, on the one hand, other firms, and the government, on the other → career prospects and incomparable economic levers (e.g., stellar salaries and stock options)

Disentangling the digital-military complex (5)

★ Digital platforms as 'eyes and ears' of governments:

▶ **At home**, platforms are a fundamental 'arm' of their government's security, intelligence and law enforcement → e.g., Microsoft has repeatedly shared threat assessments and reports of cyberattacks with the US government, while Facebook and Twitter have intervened to stop 'disinformation' campaigns by taking down networks of hijacked computer devices

▶ **Abroad**, platforms become 'eyes and ears' of their home state intelligence and military apparatuses: i) by partnering with platforms governments strengthen their grip on economies belonging to their 'sphere of influence' ii) gain advantage over enemies iii) enact what Kwet (2019) calls 'digital colonialism', *"Assimilation into the tech products, models, and ideologies of foreign powers – led by the United States – constitutes a twenty-first century form of colonisation"*
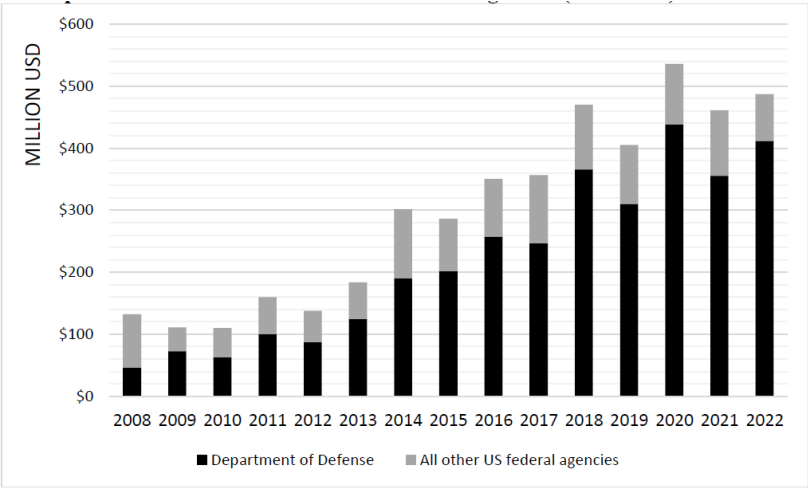
GBARD for Defence (% of total GBARD), selected countries, 1995-2021 - Source: OECD
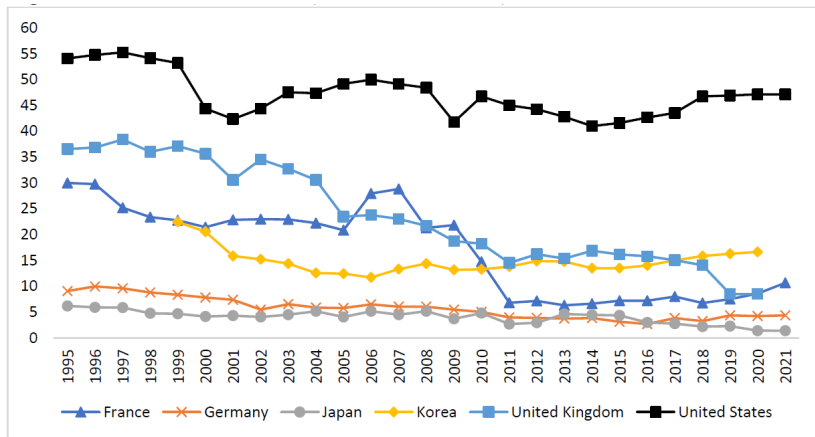
Amazon, Google, Facebook and Microsoft's procurement contracts (US Fed agencies, 2000-2022) - USAspending.gov
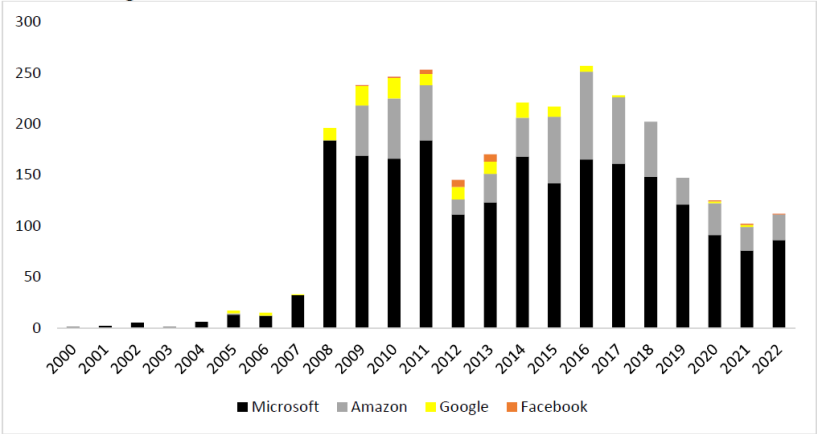
Amazon, Google, Facebook and Microsoft's procurement contracts, value (US Fed agencies, 2008-2022)

Critical technologies, infrastructures and services (1)

Year and Department/Agency	Contractor	Value ($)	Nature of service	Declared aim
2013 – CIA	Amazon	600 million	Cloud	Data management aimed at preventing terrorist attacks
2019 – DoD	Amazon and Microsoft	50 million	Drones	Defence
2020 – CIA	Alphabet, Amazon, Microsoft and Oracle	"Tens of billions" [16]	Cloud	"Commercial Cloud Enterprise" (C2E) project – cloud services centralized for 17 intelligence agencies
2021 – DoD	Microsoft	21.9 billion	Augmented reality visors	'HoloLens augmented reality headset' for military activities in highly complex contexts
2022 – NSA	Amazon	10 billion	Cloud	Cloud infrastructures for NSA ("WildandStormy" project)
2022 – DoD	Amazon	NA	Start-up accelerator	Coordination of cloud-based activities and promotion of start-ups of military relevance
2022 – DoD	Microsoft	NA	Stryker armoured vehicles	Digital devices to be incorporated into armed vehicles
2022 – DoD	Alphabet (Google public sector division)	NA	Google workspace	Provision of Google Workspace to 250,000 DoD employees
2022 – DoD	Alphabet, Amazon, Microsoft and Oracle	9 billion	Cloud	Cloud infrastructure for the Joint Warfighting Cloud Capability (JWCC)

Critical technologies, infrastructures and services (2)

▶ Project Maven: DoD's AI programme in partnership with Alphabet →
  apply Alphabet's TensorFlow AI systems to process full-motion
  images and video from drones for automatically detecting potential
  targets in war scenarios (Gonzales, 2023)

▶ AWS Modular Data Center for US DoD Joint Warfighting Cloud
  Capability: allows the DoD to deploy self-contained data centers with
  built-in AWS infrastructure to locations with limited infrastructure

Critical technologies, infrastructures and services (3)

- ▶ **AWS Snowblade:** provides AWS compute, storage, and other hybrid services in remote locations, including Denied, Disrupted, Intermittent, and Limited (DDIL) environments

- ▶ **AWS Europe Defence accelerator:** providing start-ups 'doing business with defence and national security organizations across Europe' with AWS Cloud technologies to provide energy resilience, secure information sharing, sensing and decision making, quantum, and cyber resilience
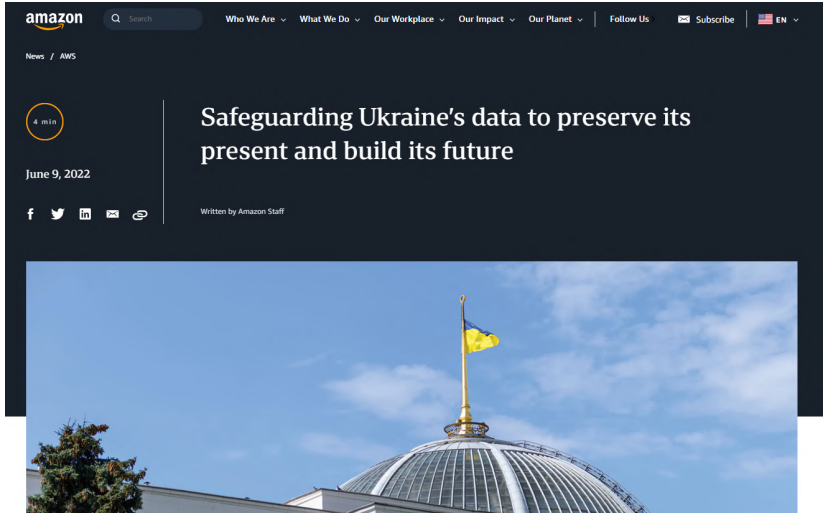
The military-platforms 'revolving doors'

- ▶ **Revolving doors:** i) imperative for governments to leverage knowledge and networks maintained by former executives to advance cutting-edge technologies for military-related initiatives ii) their experience and linkages make former members of the military apparatus key assets for digital corporations

- ▶ **Relevant cases, examples:**

- ✓ Former Apple vice-president (Doug Beck) appointed as the new director of the Defence Innovation Unit (DIU)

- ✓ Former Alphabet CEO (Eric Schmidt) member of the Defense Innovation Advisory (DIA) and the National Security Commission on AI (NSCAI)

- ✓ Former executive director of the Defense Innovation Advisory (DIA) (Josh Marcuse) becoming head of strategy and innovation for Google Public Sector

- ✓ Retired US General Keith Alexander former director of the National Security Agency (NSA) assumed a position on Amazon's Board of Directors

Digital platforms go to war: the Ukrainian battlefield (1)

- **Apple:** took the field by blocking Apple Pay electronic payments and stopping sales of its products in Russia

- **Alphabet:** banned access to advertising and distribution of Russian state media and increased security measures for user access in Ukraine

- **Facebook and Youtube:** block Russian contents and state media channels RT and Sputnik from their platform

- **Amazon:** stopped allowing new sign-ups for AWS in Russia and Belarus; Ukrainian government and PrivatBank (largest Ukrainian private bank) transferred most of their critical public and private data to AWS and are currently operating through this cloud

- **Microsoft:** announced about $100 million in additional technology aid for Ukraine through 2023, bringing its total support for Ukraine to over $400 million since the war began

Digital platforms go to war: the Ukrainian battlefield (2)

Discussion

▶ Unraveling the digital platforms-military mutual dependency allows (re)discovering the economic (and technological) roots of war

▶ Imperialism and Monopoly Capital theories are back to the fore to understand the role of dominant corporations in shaping the evolution of capitalism and that of governments operating as 'internal forces'

▶ Further research is needed to: i) better understand the channels explaining the platforms-governments mutual dependence ii) empirically document the degree of integration between corporations and military apparatuses (following up on Pianta, 1989 and other seminal studies on this matter) iii) investigating the technological and knowledge-related peculiarities that are behind the dependency that we have documented here iv) exploring the linkage between digital platforms and historical military procurers (e.g., Lockheed Martin, Raytheon Technologies) v) what about the Chinese case?