Barun ICT Global News

September 2022

YONSEI UNIVERSITY Barun ICT Research Center

01

The West's Take on the New Semiconductor Race

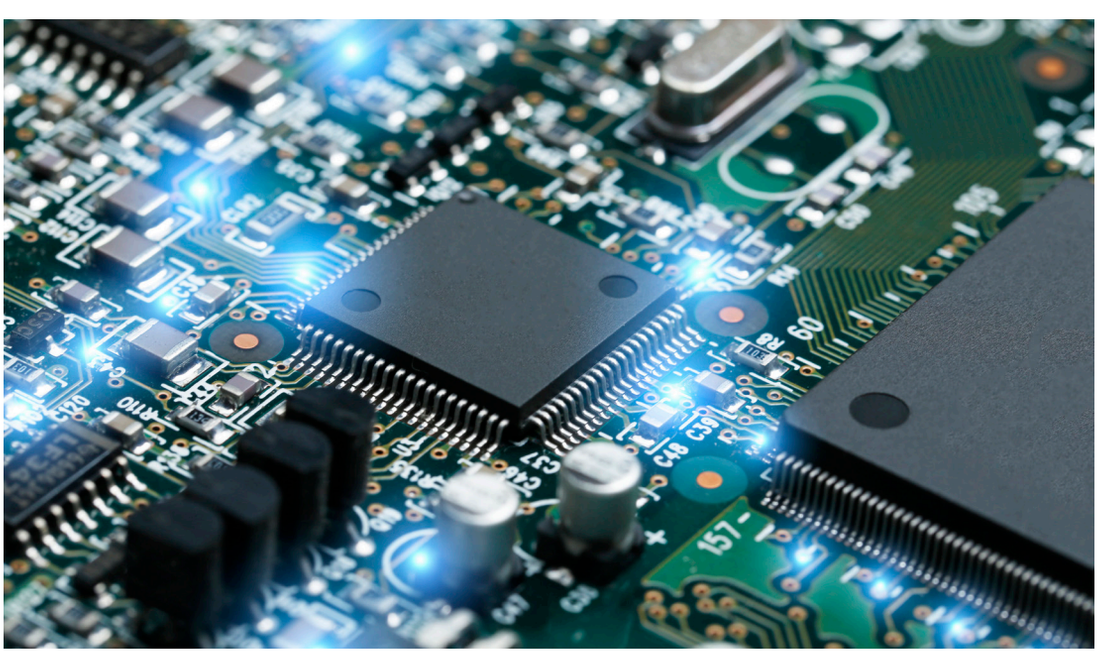
Jiri HAVEL

Department of Economics (MA Candidate), Yonsei University

In late July 2022, the U.S. House of Representatives passed legislation to subsidize the domestic semiconductor industry with USD 280 billion [1]. The unprecedented move, according to President Biden, improves the ability of the U.S. to compete with China in the future and "win in the 21st Century" [2]. The U.S. is not alone: earlier this year the European Commission announced the European Chips Act which is supposed to add EUR 43 billion of investment to the semiconductor industry [3].

Since the COVID-19 crisis, policymakers in the West have expressed their concerns about the semiconductor supply chain and the changing nature of the industry. The ongoing slowdown in industrial production, partly caused by the shortage of chips, has unleashed an old narrative about self-sufficiency and top-down approaches to manufacturing. Increasingly more politicians, including congressman Michael McCaul, even argue that the semiconductor industry is important for national security and deserves more attention and funding [4].

Currently, the world's semiconductor industry is dominated by a few Asian players; TSMC and UMC from Taiwan and Samsung from South Korea. The U.S. firm Intel, which used to be a key player, has now fallen behind - perhaps one of the reasons why 243 members of the House of Representatives voted in favor



of the subsidy in the industry. For the EU, the situation is even more challenging as there is currently no local company that can manufacture the latest chips [5].

Building up a competitive semiconductor manufacturer, however, is not something that can be done overnight. It took TSMC tens of years to perfect chip-making and gain control of a whopping 50% of the market share. Somehow, policymakers in the U.S. and EU think they can mimic this miracle by pumping billions of dollars into their under-performing industries, and the EU hopes to at least double its market share by 2030 [3]. Peter Hanbury, a semiconductor analyst from Bain consultancy, suggested that since other major players in semiconductors such as South Korea, China, and Japan are also boosting their investment, the EU should instead look into how to convince existing market leaders to establish new production facilities in the EU territory [5].

The West seems unhappy about being left out of the semiconductor game and many are alarmed that China is better prepared to lead the technology race in the 21st century. The main question is whether coming financial injections will lead to something productive. For the U.S, since there are already building blocks in terms of assets and expertise - a subsidy may help to push some of their domestic firms to build more advanced manufacturing facilities. On the other hand, in EU states which are further behind, the subsidies might as well end up in the hands of grassroot projects that will hardly surpass the technology of giants like Samsung. At the end of the day if national security is a concern for the West, it would be recommended to instead trust reliant partner democracies like South Korea or Taiwan to lead the way in this industry.

Sources

[1] Shepardson, D., & Zengerle, P. (2022). "U.S. Congress passes long-awaited bill to boost chipmakers, compete with China." Reuters.
https://www.reuters.com/technology/us-congress-poised-pass-long-awaited-bill-boost-chipmakers-compete-with-china-2022-07-28/

[2] The White House. (2022). Remarks by President Biden in Meeting with CEOs and Labor Leaders on the Importance of Passing the CHIPS Act.
https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/07/26/remarks-by-president-biden-in-meeting-with-ceos-and-labor-leaders-on-the-importance-of-passing-the-chips-act/

[3] European Commission. (2022). "European Chips Act" https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-chips-act_en

[4] McCaul, M. (2022). "ICYMI: Pass the CHIPS, Please."
https://mccaul.house.gov/media-center/press-releases/icymi-pass-the-chips-please

[5] Kharpal, A. (2022). "Europe wants to become a leader in chips. But it's going to need help." CNBC.
https://www.cnbc.com/2022/02/11/eu-chips-act-europe-will-need-help-from-us-asia-to-achieve-goals.html

02

The Evolution of Cybercrime and Recovery Responses

Christina LIU

Department of International Business, University of California, San Diego

With such an influx of users into and such overall growth of the digital sphere, it should come as no surprise that with such an extensive network comes with it its own set of crimes. There has not been one set definition of cybercrime as cyberspace itself is still developing [1].

The result of the creation of cyberspace has led to many developments such as the digital convergence that has occurred as result of the increased use of a common set of underlying technology and communication networks [1]. This convergence stems from the migration from PC based technology to non-PC products and has helped not only lower transmission costs for content but in tandem time bring new risks such as the Dark Web [1]. The Internet is a complex place and with nearly 96% of it being the Deep Web, it makes sense as to why criminals would utilize routers like the Onion Router (TOR) and why there is such an immense pressure on security agencies to monitor and trace activities given the anonymous design structure of the network that renders the user untraceable [2]. To combat these crimes and better trace these criminals/users, various techniques have been used to locate these crimes with the most common being through the means of social

media and DARPA and MEMEX which are tools that help locate individuals via a search engine [2].

Regular users will likely never come into contact with the extremity of these Dark Web crimes but as users, cybercrime prevention are things to keep in mind with the evolution of communication from off to online [3]. From the government to the police and other intelligence departments, the initiative to eliminate cybercrime is an uphill battle and it is due to this that education to spread awareness and understanding among not only the higher ups but the general public who may not be aware or literate in these areas is needed [3].

IOT has allowed us to become more connected than ever and in a society filled with smart homes, prevention is a focus to prioritize as we get more and more involved with technology. Methods vary from the simple act of keeping your computer updated to reviewing passwords and sensitive information regularly - anything to help create a barrier between you and a potential attack [4]. These small steps can help prevent the general challenges that one may face depending on their use of ICT and the amount of time and information you have given to cyberspace. One of the biggest key factors of safety is being aware and as our daily lives become more connected, it is important to remember that it is not you that is important but the data itself, so it is up to you the user to protect that data from getting taken. With the turn of the 21st century it is no longer our physical person at risk but what information we have instead [4].

Sources

[1] Malik, J. K., & Choudhury, S. (2019). A Brief review on Cyber Crime-Growth and Evolution. Pramana Research Journal, 9(3), 242.

[2] Nazah, S., Huda, S., Abawajy, J., & Hassan, M. M. (2020). Evolution of dark web threat analysis and detection: A systematic approach. IEEE Access, 8, 171796-171819.

[3] Sonthalia, S. (2021). Evolution of Cyber Bullying and It's Consequences on Teenagers. Issue 3 Int'l JL Mgmt. & Human., 4, 3211.

[4] Brauweiler, H. C. (2020). Cyber-Crime-A strong growing Riskcategory: Prevention, Protection, Defense, Limitation of Loss. In Digitalization and Industry 4.0: Economic and Societal Development (pp. 15-26). Springer Gabler, Wiesbaden.

03

Web3: Hype or Hope

Kostiulin MAKSIM

Department of Economics (PhD Candidate), Yonsei University

We keep hearing about Web3 as being a new Internet that can transform how we interact online and give us control over our own personal data. The concept of web3 is based on blockchain, NFT, cryptocurrencies, defi and other buzz words that dominate ongoing discussion about decentralization among technologists and cryptocurrency enthusiasts. But does it offer all the promised benefits of decentralization and a trustless network - or is it just a marketing campaign for venture capitalists?

In contrast to web3 where users own their data, the current model of the Internet is dominated by a few tech behemoths that not only control the Web but also have full access to users' personal data. For instance, Google controls around 87% of the global search market, while Meta has 3.6 billion unique users [1]. As the third iteration of the World Wide Web, web3 is built on the distributed ledger technology that gives more power to its users: this effectively creates a more egalitarian Web. In web3, everyone owns a piece of the Internet through NFTs that give users property rights over any kind of digital objects like images, texts, and credentials [2].

In addition to data privacy concerns, web3 also solves the problem of vulnerability of the centralized

network that was exposed, for example, by the global outage of Meta's platforms in October that affected 2.89 billion users [3]. According to the CEO of Unstoppable Domains, Matthew Gloud, in the web 3.0 users would not be dependent on Facebook as they would be able to transfer their data and contacts to other servers [3].

However, many critics see web3 as a marketing term designed for crypto traders [4]. The reason behind this skepticism is the fact that web3 is powered by crypto currency. Every contribution to the web will be rewarded by tokens similar to Bitcoin rewards. These tokens can be used as a payment for services but also as voting shares affecting the development of web3 applications and more [4]. It leads us to the next concern – web3 is not as decentralized as it seems. First, projects are dominated by blockchain companies like Alchemy and crypto exchanges like Binance and Tether [5]. Thus, instead of the promised decentralization, the industry supporting web3 is very consolidated which makes it look like it is recentralization in the hands of new tech giants instead of a democratic system where users have all the control.

Whether web3 is an empty promise or the future of the Internet, there are still a lot of challenges to be solved to make it implementable. For now, it heavily relies on the web2 infrastructure and is consolidated around a small number of providers. Only time will tell if it lives up to its potential.

Sources

[1] King, R. (2022, February 1). Web3: The hype and how it can transform the internet. World Economic Forum. https://www.weforum.org/agenda/2022/02/web3-transform-the-internet/

[2] Dixon, C. (2021, October 7). Why Web3 Matters. Future. https://future.com/why-web3-matters/

[3] Kapoor, V. (2021, October 5). Role of Blockchain in Social DApps. Medium. https://medium.com/@kapoorvedansh/role-of-blockchain-in-social-dapps-10d37637dcc4

[4] Kharif, O. (2021, December 10). What You Need to Know About Web3, Crypto's Attempt to Reinvent the Internet. Bloomberg.https://www.bloomberg.com/news/articles/2021-12-10/web3-is-crypto-s-attempt-to-reinvent-the-internet-here-s-what-you-should-know

[5] Nover, S. (2022, January 19). The decentralized web is not decentralized. Quartz. https://qz.com/2112965/web3-is-not-decentralized/

04

Maker Movements: an Opportunity for Digital Literacy and Social Innovation

Santiago Augusto SILVA

Department of Human Environmental Sciences, Yonsei University

Considering the complexity of social problems, research suggests that rather than focusing on traditional innovation policies, societal challenges should be addressed towards strengthening citizens' base of knowledge and education [1]. The maker movement, a phenomenon that has been growing around the world, can be described as a network of groups formed by designers, tinkerers, engineers, hackers, and artists that utilize their skills to create and build products that are both entertaining and helpful to the communities they are part of [2]. With its macro-level sharing, support, and cooperation, maker movements may be seen as a knowledge-building community, spreading social innovation through technology, education, and cooperation [3].

Investing in maker movements is beneficial for governments and organizations since such knowledge-building communities collaborate to create and share new information. This differs from classroom learning, which can become competitive and replicative in acquiring a set of preexisting information and completing it more successfully than one's peers [4]. The maker movement is about emphasizing embodied knowledge and non-competition, which are essential aspects for the development of social innovation.

A great example of this kind of initiative is the Maker Education Lab, a project created by Waag, a Future Lab based in the Netherlands that supports social innovation by developing technological and social design abilities, and reinforcing critical reflection on technology. Waag collaborates with a multidisciplinary team empowering people to create a more open, honest, and inclusive future [5].

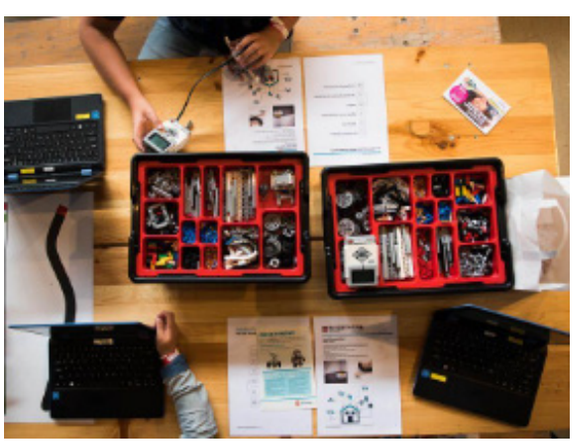


Figure1. Maker Education Lab - Make it Open project (Source: Waab)

Aligning with these values, the Maker Education Lab aspires to build a sustainable open schooling infrastructure in Europe, taking a step toward converting schools into community partnerships where learning responds to the demands of both learners and the community. Approaches to teaching and learning include Maker Education, Citizen Science, and Constructionism Learning. The initiative mainstreams the concept of Open Schooling while also increasing the level of scientific literacy of students and their families in European nations [6]. Schools that agree to be part of the Maker Education Lab are connected to spaces, fab labs, museums, galleries, and all sorts of creative institutions, both on and offline. This connection facilitates communication between these organizations allowing them to build projects together, share ideas, improve projects and expand the learning systems.

Changes in youth culture are not always reflected directly in education. As a result, there's a chance that schools will become more disconnected from different realities. Considering that technology and creativity are important catalyzers of the development of skills including problem-solving and environmental awareness, when placed together with educational efforts, maker movements such as the Maker Education Lab in Europe can offer an innovative alternative for digital literacy of children and adolescents that can use this opportunity to learn and change their own realities.

Sources

[1] Wehn, U., Vallejo, B., Seijger, C., Tlhagale, M., Amorsi, N., Kossi S. S.; Genthe, B., & Onema, J. M. K., (2021). Strengthening the knowledge base to face the impacts of climate change on water resources in Africa: A social innovation perspective . Environmental Science & Policy, (), –. doi:10.1016/j.envsci.2020.09.026

[2] Martin, L. (2015). The Promise of the Maker Movement for Education. Journal of Pre-College Engineering Education Research (J-PEER), 5(1), Article 4. https://doi.org/10.7771/2157-9288.1099

[3] Scardamalia, M., & Bereiter, C. (2006). Knowledge building: Theory, pedagogy, and technology. In K. Sawyer (Ed.), Cambridge Handbook of the Learning Sciences (pp. 97-118). New York: Cambridge University Press.

[4] Martin, L. (2015). The Promise of the Maker Movement for Education. Journal of Pre-College Engineering Education Research (J-PEER), 5(1), Article 4. https://doi.org/10.7771/2157-9288.1099

[5] Waag | Maker Education Lab. (n.d.). Waag; waag.org. Retrieved August 1, 2022, from https://waag.org/en/lab/maker-education-lab

[6] Waag | Make it Open. (n.d.). Waag; waag.org. Retrieved August 1, 2022, from https://waag.org/en/project/make-it-open

Barun ICT Global News

Publisher: Beomsoo KIM
Editor in Chief: Seungyeon WON
Editors: Alexandra STEPHENSON, Yeeun SHIN
Translators: Kyongju YU, Yeeun KIM, Subin BAEK
Designer: Subin LEE

September 2022

** Please note that any external contributions to the Global News do not represent Barun ICT's official views.*

YONSEI UNIVERSITY

Barun ICT Research Center

Barun ICT Research Center, Yonsei University
50 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea
+82-2-2123-6694 | www.barunict.org

https://www.instagram.com/barunict/
https://www.facebook.com/barunict/