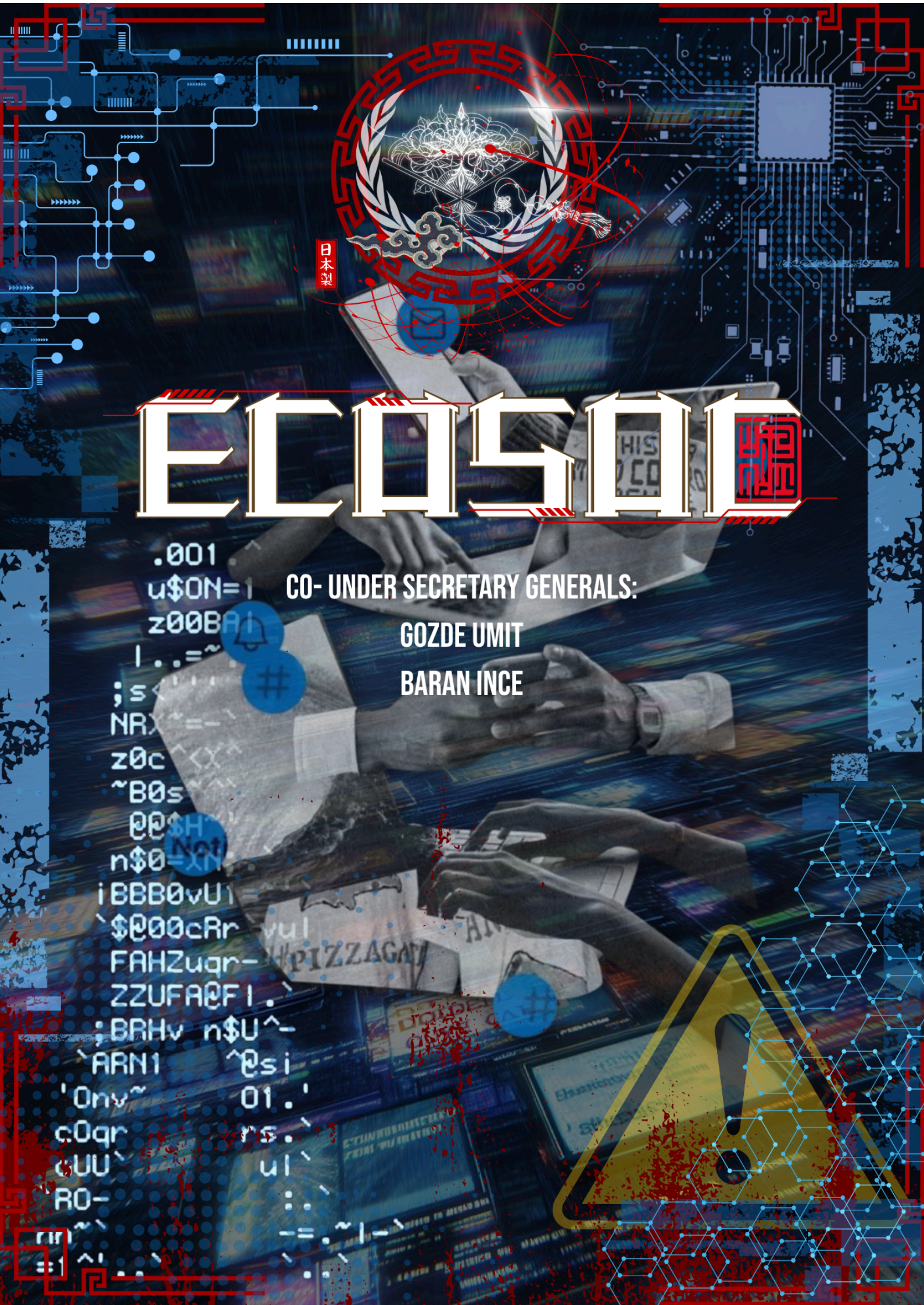

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ECOSOC
CO- UNDER SECRETARY GENERALS:
GOZDE UMIT
BARAN INCE

IONMUN'26

ECOSOC STUDY GUIDE

AGENDA ITEM:

Addressing the Impact of Big Technology Companies' Profit-Oriented Practices on Youth, Digitalization and Global Mental Health Crisis

UNDER-SECRETARIES-GENERAL:

GÖZDE ÜMİT, BARAN İNCE

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1. Letter From Secretariat

Dear Participants,

First of all, it is my utmost pleasure to serve you as the Secretary General for the first edition of ION Model United Nations Conference. I am more than proud for making this conference happen with my colleagues and looking forward to see every attendee.

Essentially MUN's are great opportunities to increase your consultation capabilities, your assertiveness and understand how policy is implemented. I can honestly state that MUN impacted my perspective on life in a positive way. For this reason, it is my mission to transfer the experiences I have gained to the new generation and to ensure that they affect them in the same way.

Lastly as the executive team, in order to put this conference together we really plod away. We really worked hard to burn the soul of IONMUN26. And do not forget ION is the timeless voices for peace.

Sincerely,

Doruk Sapmaz

2. Letter From Under-Secretaries-General

Greetings everyone,

I am Baran İnce and I will be your Under-Secretary-General on 1-3 August, First of all I would like to give my thanks to the Secretariat for giving me the opportunity of making a committee in such a conference like IONMUN'26, next upon I would like to give my special thanks to my fellow friend Gözde Ümit for being with me in this journey,

I believe that the agenda item is addressing something very important for us especially for youth, and because of that I am very excited to hear your opinions upon it,

I highly recommend all of you to read this guide carefully to come prepared to the committee, furtherly if you make your own researches under your delegations' policies' you are going to start this journey one step ahead, I believe that we are going to learn and share a lot in this committee and have lots of fun during these 3 days,

If you have any questions in your minds please feel free to contact with me at any time from:

@baranince88@gmail.com +905522972107

Sincerely,

Baran İNCE, Under-Secretary-General of ECOSOC

Esteemed participants of this committee,

I would like to welcome you all to the committee of ECOSOC in IONMUN'26. I will be serving as your Under-Secretary General during the long awaited three days of this prestigious conference. Thanks to our dear Executive Team's hard work and commitment to this conference, we are able to gather in this committee. I would like to extend my gratitudes to my dearest Co-Under Secretary General and friend, Baran İnce, for his invitation and hard work throughout the preparation of our committee . I am indeed very grateful that I was and will be able to work with him in this committee.

I am hoping from the bottom of my heart that this committee will be an extremely productive, pleasing and a very memorable experience for all of us. Our Agenda Item is "Addressing the Impact of Big Technology Companies' Profit-Oriented Practices on Youth, Digitalization and Global Mental Health Crisis". We are expecting you to create solutions related to the topics you discussed upon, collaborate with your fellow delegates and elaborate your ideas to create an efficient Resolution Paper.

Besides reading this Study Guide, we are expecting you to further research upon our topic and be prepared. Your research may contain information about your country's status, international actions and possible solutions for the issue.

You may contact me with any inquiries via email.

@umitgozde23@gmail.com

Best Regards,

Gözde Ümit, Under Secretary General of ECOSOC

2. Introductions

Introduction to the Committee

The Economic and Social Council (ECOSOC)

Established in 1945 by the UN Charter as one of the six principal organs of the United Nations, recognizes that global socio-economic inequalities constitute a fundamental challenge to human dignity, peace, and sustainable development. ECOSOC organizes international conferences, prepares draft conventions, and oversees commissions and subsidiary bodies that operate under its authority. Although significant progress has been achieved through the Sustainable Development Goals and the implementation of the 2030 Agenda, billions of people still face hardships in areas such as education, income, healthcare, gender equality, and access to basic resources.

These disparities are further aggravated by climate change, technological divides, and uneven economic growth among nations. The Council is the most influential platform for raising debate and innovative thinking among members in order to prevent potential outcomes of major issues.

ECOSOC has been the object of attempts at reform ever since the entry into force of the Charter. There have also been ECOSOC-internal reform efforts directed towards improving its relationship with international financial institutions and other governmental organizations, improving its working methods, expanding the scope of its application, and establishing new subsidiary bodies to focus on emerging issues, especially in developing countries.

Agreement on a comprehensive ECOSOC reform, to elaborate further on UNGA Resolution 61/16 and ECOSOC Decision 2006/206 regarding the adaptation of its working methods, is still pending. However, the mainstreaming of sustainable development in the work of the UN has given these attempts clearer direction. The Council is coordinating much of the organization's action, including the integration of its economic, social, and environmental dimensions. Crucially, the Council's mandate for this work is supported by the international community of States, through the series of world conferences on sustainability.

This institutionalization in turn strengthens the concept of sustainable development, the SDGs, the integration of climate action under the Paris Agreement, and the global priority of moving to a sustainable energy system that will be accessible to all. The Council provides the machinery that underpins the strategic nature of sustainable development, with goals to be achieved within a timeframe, the integration of social, economic, and environmental concerns, and the combination of bottom-up individual State action coupled with top-down review towards the collective objective.

Mandate and Functions of ECOSOC

The Economic and Social Council may make or initiate studies and reports with respect to international economic, social, cultural, educational, health, and related matters and may make recommendations with respect to any such matters to the General Assembly to the Members of the United Nations, and to the specialized agencies concerned.

It may make recommendations for the purpose of promoting respect for, and observance of, human rights and fundamental freedoms for all.

It may prepare draft conventions for submission to the General Assembly, with respect to matters falling within its competence.

It may call, in accordance with the rules prescribed by the United Nations, international conferences on matters falling within its competence.

Introduction to the Agenda Item

Over the past two decades, the digital landscape has undergone a rapid and widespread transformation, fundamentally altering the global socio-economic landscape and transitioning the primary areas of human interaction, education, and economic activity into the digital realm. Transnational technology conglomerates are at the epicentre of this shift, with their platforms handling billions of active users on a daily basis. However, underneath the promise of global connectivity lies an unregulated structural crisis: the systematic capitalisation of human attention.

Driven by profit-oriented business models that value shareholders above consumers, these corporations are engineering hyper-engaging digital ecosystems. By employing sophisticated, data-driven behavioural algorithms, these platforms intentionally exploit the vulnerable neurological and psychological development of children and adolescents to maximise screen time and ad consumption.

This aggressive focus on user retention has contributed to a severe and intensifying global youth mental health crisis. Member states around the globe are reporting significant, simultaneous increases in adolescent anxiety, clinical depression, severe sleep deprivation and body dysmorphia, which is overwhelming national healthcare systems and reducing future human capabilities. The inherent conflict of interest between unregulated corporate financial incentives and international public

health concerns has transformed this issue from a mainly parental concern into a critical worldwide challenge that threatens sustainable development goals.

Operating under its foundational mandate to promote higher standards of living, social progress, and global health solutions, the Economic and Social Council (ECOSOC) is strategically placed to address this systemic threat. The committee is responsible for critically examining the ways in which the commercialisation of digital technologies can negatively influence the well-being of youth, identifying the significant regulatory gaps in international legislation, and establishing a balance between state sovereignty and corporate accountability. To achieve this, the committee must collaborate to design and implement effective, standardized international regulatory frameworks that transition the digital landscape from a model of commercial resource extraction to a concept of "safety-by-design", ensuring a secure, equitable, and human-centric digital future for the global youth population.

3. Background

3.1. Rise of Big Technology Companies

The way the world's countries interact with each other and the global economy has been permanently changed by the fast and ongoing growth of big technology companies that operate worldwide. The tech industry has changed a lot in the last few decades. It went from being focused on Silicon Valley in the late 1900s to becoming dominated by a few huge companies. These companies have the majority of money and power.

They have a lot of influence on the global economy. Digital economies are set up to benefit the companies that can take over and control them. These companies have become the main players in communication, education, and social connection. This allowed them to grow and thrive without worrying about traditional market pressures or government regulations. They were able to buy out new competitors, influence lawmakers, and integrate their technology into the daily.

The huge profits of big tech companies depend on their ability to collect data about people's behavior and sell their attention, which changes the way teenagers think about marketing. By using very advanced, automated systems and algorithms that are designed to increase screen time, even if it causes psychological consequences, these huge companies have created the exact system that now causes global anxiety, sleep deprivation, and depression. For ECOSOC, understanding the rise of Big Tech is not an examination of technological progress. It is an analysis of a global economic shift that has given more importance to corporate profit than to the well-being of the world's youth.

3.2. Digitalization and Youth

The rapid digitalisation of modern life has significantly altered the way adolescents develop, resulting in identity formation, peer socialisation and emotional growth taking place entirely within algorithmically controlled environments. Due to the high neural plasticity of the developing adolescent brain and the immaturity of the prefrontal cortex, young people are biologically vulnerable to the dopamine-driven feedback loops engineered by Big Tech, such as infinite scrolling, push notifications and reward variability.

These profit-driven digital platforms are designed to maximise time spent on the platform rather than user well-being. They exploit young people's heightened sensitivity to social evaluation by converting self-worth into digital metrics such as views and likes. This results in essential health elements such as sleep, physical activity, and face-to-face interaction being displaced, while minors are exposed to algorithmic rabbit holes that amplify body dysmorphia, anxiety, and depression. The challenge for the committee is not to stop digitalisation, but to implement international 'safety-by-design' regulations that prevent commercial platforms from making a profit at the expense of adolescent mental health.

4. Impact on Youth Mental Health

Addiction and Overuse

Copenhagen, 25 September 2024

New data from the WHO Regional Office for Europe reveals a sharp rise in problematic social media use among adolescents, with rates increasing from 7% in 2018 to 11% in 2022. This, coupled with findings that 12% of adolescents are at risk of problematic gaming, raises urgent concerns about the impact of digital technology on the mental health and well-being of young people. These findings come from the Health Behaviour in School-aged Children (HBSC) study, which surveyed almost 280 000 young people aged 11, 13 and 15 across 44 countries and regions in Europe, central Asia and Canada in 2022.

Key findings include:

- More than 1 in 10 adolescents (11%) showed signs of problematic social media behaviour, struggling to control their use and experiencing negative consequences. Girls reported higher levels of problematic social media use than boys (13% vs 9%).
- Over a third (36%) of young people reported constant contact with friends online, with the highest rates among 15-year-old girls (44%).
- A third (34%) of adolescents played digital games daily, with more than 1 in 5 (22%) playing for at least 4 hours on days when they engage in gaming.
- 12% of adolescents are at risk of problematic gaming, with boys more likely than girls to show signs of problematic gaming (16% vs 7%).

The report defines problematic social media use as a pattern of behaviour characterized by addiction-like symptoms. These include an inability to control social media usage, experiencing withdrawal when not using it, neglecting other activities in favour of social media, and facing negative consequences in daily life due to excessive use.

Implications of increased problematic social media use

The rise in problematic social media use among adolescents raises significant concerns about potential impacts on young people. Previous research has found that problematic social media users also reported lower mental and social well-being and higher levels of substance use compared to non-problematic users and non-users. This trend, if continued, could have far-reaching consequences for adolescent development and long-term health outcomes. Moreover, problematic social media use has been associated with less sleep and later bedtimes, potentially impacting adolescents' overall health and academic performance.

“It’s clear that social media can have both positive and negative consequences on the health and well-being of adolescents,” noted Dr Hans Henri P. Kluge, WHO Regional Director for Europe. “That’s why digital literacy education is so important. Yet it remains inadequate in many countries, and where it is available, it often fails to keep pace with young people and rapidly evolving technology. We are seeing the consequences of this gap, with worse likely to come, unless governments, health authorities, teachers and parents recognize the root causes of the current situation and take steps to rectify it. As millions of children across the Region return to school after the summer holidays, some countries are considering restrictions or outright bans on social media for children up to a certain age. It’s clear we need immediate and sustained action to help adolescents turn the tide on potentially damaging social media use, which has been shown to lead to depression, bullying, anxiety and poor academic performance.”

Positive aspects of social media use

While the report highlights the risks, it also underscores the benefits of responsible social media use. Adolescents who are heavy but non-problematic users reported stronger peer support and social connections.

As one 17-year-old boy from Poland shared, “There are many benefits of social media, especially when it is used in moderation. Among the benefits, there is connection and connectedness. Teenagers may meet others who share their passions and interests”.

“This study reveals both the promise and the pitfalls of digital engagement for our young people,” said Dr Natasha Azzopardi-Muscat, Director for Country Health Policies and Systems, WHO Regional Office for Europe. “It’s crucial that we take

steps to protect youth to allow them to navigate the digital landscape safely and equip them to make informed choices about their online activities, maximizing the benefits while minimizing the risks to their mental and social well-being. In short, they should rule social media, and not have social media ruling them."

Gaming trends and their implications

The report also reveals that 34% of adolescents play digital games daily, with 22% playing for at least 4 hours on gaming days. While 68% were classified as non-problematic gamers, 12% were at risk of problematic gaming.

A previous HBSC study examining problematic online gaming behaviour in five countries found associations with lower life satisfaction, more frequent psychological complaints and lower peer support. However, for many adolescents, gaming remains a harmless or even beneficial pastime.

Dr Claudia Marino, one of the report authors at the University of Padova, noted: "The gender differences in gaming patterns are striking. Boys not only show higher rates of daily gaming but are also more likely to develop problematic gaming habits. This highlights the need for targeted interventions that consider gender-specific motivations and risk factors in gaming behaviour".

Targeted interventions

Interventions to address problematic social media use should be age-appropriate, gender-sensitive and culturally tailored. They should focus on helping young people develop digital literacy skills, promote healthy online

behaviours and provide support for those at risk of problematic use.

As one boy from England suggested, “I think it is more important to make social media better and safer, and teach people how to use it safely and to look after themselves”.
This highlights the need for improved digital environments and education that empower young people to navigate online spaces safely.

Roadmap for action

While the findings are sobering, they also offer a roadmap for the way ahead. The WHO Regional Office for Europe – covering Europe and central Asia – calls upon policy-makers, educators and health-care providers to prioritize adolescent digital well-being with the following specific calls to action:

- Invest in a health promoting school environment, in which digital literacy education is embedded. Implement evidence-based programmes in schools covering responsible social media use, online safety, critical thinking skills and healthy gaming habits.
- Enhance mental health services. Ensure access to confidential, non-judgmental and affordable mental health services which can address issues arising from problematic digital technology use.
- Promote open dialogue. Encourage conversations about digital well-being within families, schools and communities to reduce stigma and increase awareness.
- Train educators and health-care providers. Provide specialized training to deliver effective and inclusive digital literacy education and support.

- Enforce platform accountability. Ensure social media platforms enforce age restrictions and create a regulatory framework encouraging responsible design of digital tools for young users.

"Ultimately, what we are seeking to achieve for our children is a solid foundation for life in the digital age, something social media companies and young people alike are beginning to acknowledge and act upon around the world," concluded Dr Kluge. "Digital literacy in the context of child development and well-being, informed by the right knowledge at the right time along with the right health and other support services, are critical. By empowering adolescents to make informed decisions about their online activities, balancing their online and offline worlds, we ultimately help safeguard and improve their overall well-being. This is crucial for ensuring a healthier, more balanced digital future for all communities, societies and countries."

Anxiety and Depression

Depression and anxiety are among the most prevalent mental health conditions affecting children, adolescents, and young people globally, contributing substantially to the overall burden of disease in this population. Early onset of these disorders is associated with a range of adverse outcomes, including impaired social and academic functioning, increased risk of recurrence, and heightened vulnerability to long-term mental health difficulties. Despite the availability of evidence-based psychological treatments, a significant proportion of young people do not receive adequate care. Barriers such as stigma, limited service availability, high costs, and shortages of trained mental health professionals, particularly in low- and middle-income settings, continue to constrain access to timely and appropriate interventions.

In response to these challenges, digital mental health interventions have emerged as a promising and scalable approach to expanding access to care. These interventions encompass a wide range of modalities, including web-based cognitive behavioral therapy (CBT) programs, mobile health (mHealth) applications, tele-mental health services, chatbots, serious games, and text messaging–based interventions. Digital platforms offer several advantages that are particularly relevant for youth populations, including accessibility, flexibility, anonymity, and the potential for large-scale dissemination. Given that young people are among the most active users of digital technologies, such interventions are often considered well aligned with their help-seeking behaviors and communication preferences.

However, the growing enthusiasm surrounding digital mental health has often been accompanied by an implicit assumption of uniform effectiveness. Emerging evidence suggests a more complex reality. Digital interventions vary substantially in their design, level of human support, theoretical orientation, and implementation context, leading to considerable heterogeneity in outcomes. Increasingly, digital mental health is being conceptualized not merely as the digitization of existing therapies, but as a new model of care delivery situated within broader stepped-care and hybrid systems. Within this framework, factors such as user engagement, personalization, and integration with existing services are understood to be central to intervention effectiveness, rather than peripheral considerations.

A rapidly expanding body of research has examined the use of digital interventions for the prevention and treatment of depression and anxiety in youth. Nevertheless, the evidence base remains highly heterogeneous, spanning diverse study designs, populations, intervention modalities, and outcome measures. Some interventions are fully self-guided, whereas others incorporate varying degrees of therapist or peer support. Similarly, some studies focus on prevention in general

populations, while others target clinical or high-risk groups. Engagement and adherence have emerged as critical challenges, yet are inconsistently measured and reported across studies. This heterogeneity complicates efforts to synthesize findings and identify clear patterns of effectiveness.

Given the breadth and diversity of this field, a comprehensive mapping of the existing literature is required to better understand the range, characteristics, and focus of digital mental health interventions for youth. A scoping review is particularly well-suited to this objective, as it enables the systematic identification and characterization of evidence across a wide range of study designs and intervention types, without restricting inclusion to specific methodologies or outcomes.

5. Key Stakeholders

Governments

The responsibility for finding solutions to the problems affecting young people – such as unemployment, low representation in political processes, and social exclusion – lies largely with Governments, according to a United Nations report on youth engagement released today. The World Youth Report on Youth Civic Engagement, compiled by the UN Department of Economic and Social Affairs (DESA), explores young people's participation in economic, political and community life, and is intended to serve as an impetus and tool for policy discussion between youth and government.

On economic engagement, the report notes that unemployment affects more than 73 million young people around the world, with the jobless rate exceeding 50 per cent in some developing countries. In low- and middle-income countries,

underemployment in the informal sector is considered the primary employment challenge among young people. In addition, inadequacies in skills and education, the lack of support for entrepreneurship, and diminishing labour rights have negatively affected youth economic engagement. The report warns that an increasing number of companies and organizations are offering, often full-time and unpaid, internships for recent graduates. In many of such incidents, internship is not necessarily linked to specific educational outcomes, but replaces the work of regular paid workers. “In addition, it is now not uncommon for young people to undertake numerous back-to-back unpaid or low-paid internships as they struggle to gain a foothold on the career ladder,” the report says. “Far from better preparing young people for economic life, unpaid internships have the potential to leave youth in an economically more vulnerable position than they would be in had they never undertaken the internship in the first place.”

As such, many young people are calling for stronger regulations and the development of benchmarks for quality internships to avoid exploitation, the report says. Governments often promote youth entrepreneurship while failing to stimulate wider employment creation through robust strategies, “unfairly” shifting much of the responsibility for job creation from the larger public and the private sector to young people. Political engagement Youth participation and representation in institutional political processes and policy-making around the world is relatively low, according to the report. Voter turnout in elections tends to be significantly lower among youth than among adults, and young people are less likely to become members of political parties. Although youth have played a visible and prominent role in demonstrations and protests and have often been instrumental in bringing about changes in governance, the role of young people following political transition remains largely undefined and, in many cases, they remain excluded, the report notes.

In countries experiencing power vacuums, young people can often be coerced, or otherwise forced out of economic necessity, to join violent groups and extremist elements. The availability of ever-growing numbers of online and social media outlets and other web-based tools has played a huge role in bolstering young people's activism and participation, but the extent to which cyber activism translates into sustained lifetime political engagement is unclear. While young people are gradually moving away from institutionalized structures, such as electoral activities and political parties, they are moving towards cause-oriented activism. Although the extent of their participation has varied, young people around the world have always been active at the community level through volunteerism, peacebuilding efforts and sporting activities.

Community engagement often provides young people with their first experience of active participation in a cause or activity, serving as a gateway to further and broader engagement throughout life as well as opportunities for leadership building. The report draws a conclusion that in all three of the areas, youth engagement in society relies on the active participation and commitment of Governments. While young people need to play a central role in addressing issues that affect them, they cannot tackle the multitude of challenges alone, particularly in the economic and employment area, it says.

Technology Companies

Nearly three-quarters of the most popular apps and online platforms directed at children are likely profiting from user data—even if they claim otherwise, according to Common Sense Media, a nonprofit research and advocacy organization that studies the impact of technology on youth.

Common Sense spent the past year scrutinizing the user agreements for some 200 platforms, including many of the most popular ed tech tools used in K-12 schools and platforms owned by Meta, the parent company of Facebook, Instagram, and Threads. Many of those popular products say that they don't sell user data.

That may be true in the sense that they don't share users' names, locations, birthdays, and similar information wholesale with data brokers or other companies, said Girard Kelly, the director of Common Sense Media's privacy program. But that doesn't mean they aren't making money off information they get from users.

Instead of selling things like names and birthdays, the companies charge third parties for user profiles—essentially information they have gleaned from tracking what a child or their family clicks on and looks at, and for how long. The data can include both activity within the app and sometimes across the broader internet, Kelly explained.That allows the companies to get a "very specific, individualized list of preferences and behaviors" for its users, even if there's no name, phone number, or IP address attached, Kelly said.

That's how it's possible to follow a user from app to app or website to website and continue to encounter "targeted ads or to pop up notifications or persuade them to purchase other things" that might not even be related to the content of the app that sold their data. That means students see targeted ads even when using apps or platforms chosen by their school or district.

"This idea of profiling, of tracking, of target advertising, these are all ways apps make a ton of money," Kelly said. And companies aren't upfront about this, Kelly added. Their user agreements often start with some version of: "We respect your privacy, we would never sell your data. And then on page 50, they get into all the

ways that they monetize your data … That's where the unfair and deceptive trade practices come in.

"Until recently, it was legal for companies selling this type of user information to claim that they don't sell users' personal data. That changed recently, at least in California, which passed the California Consumer Privacy Act earlier this year.

The law makes it illegal for companies operating in the Golden State to track users' online behavior and sell that data for profit, while saying they don't profit off user information because names and other identifiers aren't attached. Most companies have yet to comply with the law, however, Kelly said.

"The laws are changing, and companies are not being transparent," he said. "We can't rely on companies' statements right now that they're not selling [user] data.

" His advice? Educators should instead contact the companies directly and work out a separate user agreement for their school or district that complies with state privacy laws.

International Organizations & NGO's

The role of non-profit organizations is evolving in response to digital transformation, global advocacy networks, and the renewal of grassroots movements. This article explores how NGOs adapt to emerging paradigms such as co-production, commons-based governance, and network collaboration, while balancing professionalism with democratic participation. It analyzes digital mobilization and the rise of platform-based activism, alongside enduring forms of local organizing that sustain legitimacy and community trust.

Drawing on examples from global movements like #MeToo and Fridays for Future, the discussion highlights both the opportunities and vulnerabilities of digital and hybrid civil society models. The article concludes that the future of NGOs depends on their capacity to integrate technological innovation with participatory governance, creating flexible, accountable, and resilient forms of civic engagement in an interconnected world.

6. Legal and Ethical Framework

Societal sustainability

Sustainability is typically viewed as consisting of three forces, economic, social, and ecological, in tension with one another. In this paper, we address the dangers posed to societal sustainability. The concern being addressed is the very survival of societies where the rights of individuals, personal and collective freedoms, an independent judiciary and media, and democ-racy, despite its messiness, are highly valued. We argue that, as a result of various technological innovations, a range of dysfunctional impacts are threatening social and political stability.

For instance, robotics and automation are replacing human labor and decision-making in a range of industries; search engines, monetized through advertising, have access to, and track, our interests and preferences; social media, in connecting us to one another often know more about us than we ourselves do, enabling them to profit in ways which may not coincide with our well-being; online retailers have not only acquired the abil-ity to track and predict our buying choices, but also they can squeeze vendors based on their outsize bargaining power; and, in general, virtual technologies have changed both the way we think and our sense of self. With the rising deployment of the Internet of Things, and developments in machine learning and artificial intelligence, the threats to individual freedoms and

rights, societal cohesion and harmony, employment and economic well-being, and trust in democracy are being ratcheted up.

This paper lauds the benefits and addresses the harm wrought by the high tech giants in Information and Communica-tion Technologies (ICTs). The search for rapidly growing revenues (and shareholder returns and stock prices) drives firms to accelerate product innovation without fully investigating the entire gamut of their impacts. As greater wealth accrues to the leaders of tech firms, inequalities within firms and societies are widening, creating social tensions and political ferment. We explore the ethical nature of the challenge employing a simple utilitarian calculus, complemented by approaches rooted in rights, justice, and the common good. Various options to address the challenges posed by ICTs are considered and evalu-ated. We argue that regulation may do little more than slow down the damage to society, particularly since societal values and political preferences vary internationally.

Firms need to establish ethical standards, imbuing the upholders of these standards with sufficient authority, while creating a culture of morality. User involvement and activism, and shareholders' concerns for the sustainability of societies on whose continued prosperity they depend, are imperative to humanity's ability to decide the future direction of technology.

Innovation in products, processes, marketing, and manage-ment has been central to the success of firms and nations both in manufacturing and service industries. The technol-ogy–market linkage has fueled a growth trajectory that com-panies and countries hope to ride to ever-rising levels of prosperity. There are, to be sure, challenges to be overcome such as ecological and social sustainability. In this paper, we address the dangers posed by the constant drive to innovate (and disrupt) to

another dimension of sustainability, that of our institutions, political systems, and of civil society itself, which we term societal sustainability.

The concern addressed here is the very survival of societies where the rights of individuals, personal and collective freedoms, an independent judiciary and media, and democracy, despite its messiness, are highly valued (Levitsky and Ziblatt 2018; The Economist 2018). Robotics and automation are replacing human labor and decision-making in a range of industries; search engines, monetized through advertising, have access to, and track, our interests and preferences; social media, in connecting us to one another often know more about us than we ourselves do, enabling them to profit in ways which may not coincide with our well-being; online retailers have not only acquired the ability to track and predict our buying choices, but also they can squeeze vendors based on their outsize bargaining power; and, in general, digital technolo-gies have changed both the way we think and our sense of self. This paper acknowledges the benefits offered, and addresses the harm wrought, by the high tech giants ('big tech') in Information and Communication Technologies (ICTs), and related industries. The search for rapidly grow-ing revenues, shareholder returns and stock prices drives firms to accelerate innovation without fully investigating the entire gamut of their impacts. Additionally, greater wealth accrues to the leaders of big tech, and inequalities within firms and societies widen, creating societal tensions and political ferment (Brynjolfsson and McAfee 2014; Bridle 2018). Exploring the ethical nature of the various challenges, and suggesting possible ways in which the threat posed to individuals and institutions might be ameliorated, could be of interest to businesses and educational institutions, particu-larly ones where the virtues of big data are extolled while the ethical challenges that arise are often ignored or glossed over. In light of the increased scrutiny of big tech, the need to look beyond immediate (mainly financial) benefits, and study the long-term impacts on individuals and societies is also of great relevance now, both for businesses and policy makers.

Ethical criteria

The product choices that big tech companies make obvi-ously have great significance to individuals and to society at large, creating ethical issues that need to be confronted. Product-related decisions may have a direct and immediate influence (say, on users in terms of privacy and security) or indirect and future (user data is used to cull information affecting insurance premiums, creditworthiness, and so on). Big tech firms need to consider the impacts on users, particularly the costs to society itself, regardless of the profit potential. The need to adopt this broad perspective, encompassing all stakeholders, was acknowledged recently when over 180 CEOs of major firms signed a declaration to this effect (Gelles and Yaffe-Bellamy 2019). An ethical screen could help evaluate the extent to which individual and collective stakeholder interests are satisfied (Laudon 1995; Varlan and Tomozei 2018). Among the approaches which could help in making ethical decisions, as distilled by Capsim (2018) and the Markkula Center (2019), are those based on rights, justice, common good, virtue, and utilitarianism.

We now briefly develop the principles underlying each of these perspectives with a view to suitably framing the ethical challenges facing big tech.According to the rights approach, people ought to be treated as ends in themselves not as means or instruments to achieve desired results. The dignity of every individual and the freedom to make choices are to be carefully safe-guarded. Ethics as justice calls for treating everyone fairly by applying a common, unbiased standard. In the common good approach, the community is the unit of analysis, and calls for acting in the best interests of society, especially those less able to fend for themselves. The virtue perspec-tive asserts that certain universal values exist such as hon-esty, compassion, not harming others, integrity, and so on.

All actions are evaluated through the prism of these values. Utilitarianism, more specifically act utilitarianism (De Lazari-Radek and Singer 2017), focuses on the con-sequences of decisions, maximizing the good done while keeping the harm inflicted to a minimum. This standard recognizes that few actions have purely beneficial outcomes, but that the latter should outweigh any ill effects which might arise. In the corporate context, utilitarianism offers a convenient way to evaluate the ethicality of deci-sions, in part, due to its greater amenability to measure-ment (Markkula Center 2019). The assessment of benefits and costs is often conducted with a view to creating greater shareholder value, using a monetary metric. The latter is generally easier to measure, which could lead to devalu-ing other stakeholders' (customers, suppliers, local com-munity) interests, and ignoring intangible costs (Kelman 1981; Lowry and Peterson 2011). In this paper, we evalu-ate the ethics of big tech using the utilitarian approach specifically from the stance of users, suppliers, and society itself. In making the ethical assessments, we fold in the common good, justice, and rights approaches, to comple-ment the utilitarian perspective where applicable. The table presents the benefits of developments in the field of big tech, which are divided into two categories: Direct/Present (DP) versus Indirect/Future (IF). For each type of benefit, we identify costs or negative outcomes, which are classified similarly.

Direct/present benefits

We have mentioned some of the benefits such as increased, accelerated, multimedia access to information earlier. Other DP advantages are the instant access to entertainment anywhere through a host of music and visual streaming sites, games which can involve one or more players, taking photographs which can be sent to friends and family at any time, and so on. Social media not only connects individuals (and groups) but also can result in an extended network of like-minded people who

engage with participants in their circle in a variety of ways. One can track down friends and acquaintances from the past, join common-interest groups, buy advertised products, share thoughts and opinions, fol-low and post replies to assertions made by others, alert one's friends to events and recent developments, catch up with the latest news, and so on. In addition, our devices keep us connected to a much larger and, if we wish, ever-expanding virtual range of friends. We have a variety of activities to occupy us, mitigating feelings of boredom and a sense of being alone, even if it be expressed in the form of a "like" (Prado 2017). Sharing thoughts and feelings without face-to-face contact could also reduce stress especially when others empathize and share their own experiences. In a sense, elicit-ing appreciative responses to sharing details of our personal life could also make us feel better about ourselves, enhanc-ing our sense of self-esteem (Kingwell 2017).

In today's "instant" society, not only can we find answers and commu-nicate at the speed of thought, so to speak, but also we can buy anything that catches our fancy online. In addition, the websites themselves suggest items which might appeal to us, based on our previous, and inferred, preferences (Radovan 2013).In the case of services such as search, email, social media, navigation, and other apps, the dollar price is perceived as zero, creating an obvious consumer's surplus. The use of the "free" service becomes a 'no-brainer' to the user. Scholars have pointed out, however, that "free" in this context should be taken to mean liberty or freedom to use rather than being related to price (Agar 2019).

The mammoth profits earned by the likes of Facebook, Google, Amazon, Microsoft, and other big tech firms attest to how successfully these firms serve the needs of their clients ("client surplus"), their adver-tisers. To deliver more value to its clients, big tech needs to gather more and more data about its consumers, enabling it to track and even predict user behavior. The rising efficacy with which ads, news, and

messages are delivered to users leads to an upward spiral of both consumer surplus and cli-ent surplus, while proving to be ever more lucrative to the firms fueling the 'data revolution' (Greene 2018).

Direct/present costs

The problems arising from the availability of user data are well known. Just as social media can connect one to friends and family, they can also use the data to micro-target indi-viduals for commercial and political purposes. Third parties may gain access to an individual's preferences as well as aggregate these preferences to generalize to an entire seg-ment of users (e.g., senior citizens, women under thirty-five, recently naturalized citizens (Stahl etal. 2017; Sumpter 2018). The potential for foreign intervention in elections remains high (Rutenberg 2019), even if firms try to mitigate the threat (Satariano 2019). Search engines' algorithms typi-cally store results of previous searches, which can not only be a convenience, but can also be viewed as an intrusion into one's right to privacy. Users have apparently made a sort of Faustian bargain in which they share their data and identities in order to gain access to providers' services.

As Finnemore (2018) notes, users are the crop harvested by big tech. The reluctance on the part of these mammoth corporations to be transparent or openly share what actions they undertake behind the scenes is what brings the issue of ethics into the picture (Jasanoff 2016). Of late, some of the big tech firms have issued statements assuring users that they are commit-ted to maintaining the privacy of user data. However, critics argue that when it comes to a question of user privacy versus advertising revenues, firms are likely to dilute the privacy criterion (Mack 2014;

Pichai 2019; Tufekci 2019; Waka-bayashi and Chen 2019).Some writers have argued that, as in a production/ser-vice economy, economies of scale and scope are critical in a digital world as well.

The only difference is that, rather than applying to volume and variety of output, the econo-mies now apply to the extraction, analysis, application, and monitoring of data with a view to modifying, predicting and even controlling behavior. If DA is the amount of data needed to provide users with the value needed to retain their attention and loyalty, any additional data (say DB) extracted helps increase producer surplus now and into the future. The "behavioral surplus" DB serves to align user behavior with big tech and their clients' needs (Zuboff 2019a). Innovation in the digital economy contributes to rising (perceived) con-sumer surplus, greater client surplus (effectiveness of adver-tisements), and, above all, scale economies in data extraction and use. Leveraging data among a firm's various products (present and potential) generates scope economies [e.g., using the same data to deliver targeted ads and to determine creditworthiness for a loan (Zuboff 2019b)].

Impact on cognition and attention; children as targets

While much of the concern over the accelerating use and influence of the "gig economy" has been directed to issues such as data privacy and security (and rightly so, as noted earlier), there are other, potentially harmful, consequences which merit a closer look. Take, for instance, the extent to which many people have become dependent on digital sources for information, social interaction, lifestyle choices (where to live, whom to date, how to care for an infant), and so on. Such an abiding trust in, and reliance on, digital tech-nology verges on addiction and could significantly alter our cognitive processes, our social skills, and even our emotional wellbeing (Kingwell 2017; McFarlane 2017).

Sagan (1974), Harari (2011, 2018), and other scholars have theorized that homo sapiens, while in the hunter-gatherer stage, developed differently from other species by cultivating the ability to observe, reason, and remember, and to share information about food sources, weather patterns, geographic features, and so on. This "cognitive revolution", it has been argued, was the point at which humankind diverged developmentally from all other species. As Carr (2008) observes, we may be surrendering one of the defining characteristics which makes us human for the convenience of having technology (our cre-ations and tools) assumes an increasing part of the process of cognition. There are early indications that attention spans are shortening, information is increasingly being sought for vicarious ends (e.g., following celebrity lifestyles, pornog-raphy, etc.), and we are losing the ability to treat technology as an extension of ourselves, and are becoming dependent on our creations (Prensky 2001; Kingwell 2017). Milner (2016) provides several instances of the latter in regard to the use of GPS. He cites numerous instances of people blindly fol-lowing instructions provided by their GPS app even when they knew it was leading them astray, sometimes with fatal consequences.

The author argues we are undoing the neu-ral connections that enabled our ancestors to reason along spatial and temporal dimensions. In a sense, human society is fast developing into a "technopoly" (Postman 1993)—a society whose culture is shaped by technology rather than values. One technological development leads to another in a seemingly inexorable progression of new services to which most of us are drawn since they offer ever more convenience and gratification at little or no cost (Walsh 2018).An even more serious threat to society is that children are being targeted apparently as part of a plan to create a loyal base for the websites concerned for extended periods. While some children's programming may indeed inform and educate, the purpose of the underlying algorithms is to hold the user for as long a

stretch of time as possible (Lafrance 2017). Apple, after soliciting apps to limit time spent on a device, has now taken over the task itself, no doubt realiz-ing the lucrative and data-rich nature of the task. The com-pany is also under fire for allegedly favoring its own apps over those of outside developers (de Looper 2019; Nicas 2019).

You-tube operates a highly lucrative children's site but stands accused of creating techniques to foster addictive viewing and even of installing inadequate safeguards against switching over to adult programming (Bridle 2018). Fears have been expressed about the effect that long-term use of the internet, social media, digital assistants, and other accou-trements of digital technology might have on children's and adolescents' behavior. The observed behaviors and effects include cyberbullying, depression, and sleep deprivation (Child Mind Institute 2017).

Social influence

The social impacts of ICTs are almost as deep and worri-some as the effects on cognition (Ross 2011). It is difficult to deny that social media (Facebook, Twitter, You-tube, and others) have, beside connecting us with others and enabling us to express our opinions, created a high degree of self-absorption and a craving for recognition (Rosen 2007). The resulting focus on oneself borders on narcissism, and has affected the ability of many people to interact in a healthy way with others at school, work, home, as well as in reli-gious and civic organizations. In fact, the amount of time spent online not only means we have less time to spend with others, but also it could be changing the ways in which our brains are wired. In addition, linguistic abilities, the pow-ers of reflection and introspection, and attentiveness to the task at hand may be adversely affected.

Other, more obvi-ous, problems include the ease with which hate speech and harmful content can be spread, and the extent to which bullying and divisiveness have entered common discourse (Ives 2019). Sites such as Facebook and You-tube are try-ing to monitor and control the posting of harmful content but it may be an uphill task given the need to track an ever-increasing number of participants who follow recommenda-tions, pay for premium services, and buy sponsored prod-ucts (Alba et al. 2019). In addition, the fact that "platforms" cannot, by law, be held responsible for content uploaded to their sites works in big tech's favor (Wakabayashi and Chen 2019). While pro-democracy movements such as the Arab Spring were partly fueled by social media, the latter have also enabled the spread of misinformation, rumors, and dangerous ideas.

In Myanmar, Sri Lanka, New Zealand, and other countries, Facebook, Twitter, and Google were seen as spreading extremist and violent content (Wilson 2019; Mozur 2018). Big tech is also routinely used by governments to disseminate information aimed at stifling dissent (King-sley 2019; Rezaian 2019). It is, indeed, chilling to read that India's democracy is being subverted using modern tech-nology, in part, by shutting down access to the internet or cell phone communication more frequently than any other nation (Human Rights Watch 2016). Clearly, while many of big tech's innovations have been beneficial, they have also been subject to 'weaponization' (Swisher 2019) by states, corporations, and other actors.Social services, such as administering the food stamp program, are already being outsourced to big tech, with the express purpose of making them more efficient which typi-cally results in reducing or denying services (Eubanks 2019).

Policing and crime reduction through the use of facial rec-ognition software are also well advanced and, despite their flaws, biases, and obvious threats to privacy, are being exten-sively implemented—and not just in authoritarian societies (Metz and

Singer 2019; Newman 2019). Clearly, the rights of individuals are being jeopardized, often and ironically, under the guise of protecting free speech. It is also obvious that the common good is being sacrificed on the altar of effi-ciency, profits, and shareholder wealth (Chakhoyan 2018).

Technology, power, and government

As a result of their ability to tackle the provision of all sorts of services often at little or no obvious cost to customers, tech firms are viewed by many as being uniquely capable of accomplishing any task they undertake. Though few leaders of big tech would argue that governments are superfluous, their actions are directed to exercising greater influence over governments. For instance, lobbying and efforts to influence legislation have expanded over the past 10 years, rivalling those of more "traditional" industries such as energy and finance (Dellinger 2019). The fact that the U.S. federal government has little investment in the development of AI further increases its dependence on big tech (Webb 2019).

With an increasing part of the population, in many coun-tries, getting their news from search engines and social media, the role of print, television, and other journalism has declined precipitously. This "squeezing out" of jour-nalism has also meant that the ethics of the field are being loosened. No longer do sources have to be vetted and cor-roboration sought, or opinion separated from fact, which can harm individuals' rights and imperil the common good. Indeed, the Fifth Estate, as Greene (2018) terms big tech, by displacing traditional media, is undermining civil society. It appears that the influence of, and potential for, misinformation and the sowing of chaos in politics, are likely to keep rising (Rutenberg 2019). For instance, Facebook

appears to have thrown in the towel where curating of user uploaded news is concerned (Boyle 2019).

It is clear that big tech firms view themselves collectively as laying a legitimate claim to being good for society by efficiently serving a variety of users' needs in an expanding range of industries. At this point, it appears that big tech is not only too big to fail but also too big to regulate. The heads of the largest tech companies have been referred to as tech oligarchs (Greene 2018), whose ambition is not merely to disrupt one industry after another but to change the world to accord with their mental models. It is paradoxical that technologies such as the internet, personal computer, and smart phone, which ostensibly enable greater decentralization, have now resulted in a higher concentration of power especially where mammoth firms like Google, Facebook, Amazon, Microsoft, and Apple are concerned, or in the hands of authoritarian governments.

Centralization of power has meant that we may be players in a new kind of economy, one that some authors have termed surveillance capitalism (Zuboff 2019; Webb 2019) or a surveillance state (Pinker 2019). The sense of omnipotence that pervades the digital giants is such that they are now engaged in grandiose pur-suits such as settling on other planets (where, presumably, they would make up the rules, not live by someone else's), extending life indefinitely and perhaps achieving immortal-ity, eliminating poverty, and so on. In the tech oligarch's world, technology can solve any problem (Greene 2018).Technology is, by its very nature, a political and cultural phenomenon (Winner 1986; Jasanoff 2016). For instance, the construction of certain highways with low overhead clearances in Long Island was meant to prevent low income individuals from living in those neighborhoods.

The pro-liferation of multi-storied apartments and offices in cities creates a divide between urban residents and nature, the dif-fusion of the automobile resulted in a migration to the suburbs, television and the computer have tended to curb social interaction, and so on. With the passage of time and the increased emphasis on predictive data analytics combined with machine learning, real power has been rapidly accrued by big tech (Nicas etal. 2019), while apparent power still resides with the individual.While on the subject of individual rights, one cannot ignore the issue of employment. In the tech industries them-selves, firms try to minimize the head count of permanent employees to the extent feasible. About half of Google's work force consists of contractors, vendors, and temps ("CVTs"), Uber treats its drivers as contract workers, and Facebook and You-tube have hired thousands of temps to review and screen uploads, thus taking us back almost to pre-union times when employees at lower income levels had little to no rights (Sheng 2018; Wong 2019).

In their aggressive, male-dominated working environments, high tech firms have tended to devalue women, particularly at firms' higher echelons, much in the way that financial services firms have (Rangarajan 2018; Business Insider 2019). The relative lack of diversity stems from educational systems and corporate practices which give rise to 'tribes' (Webb 2019), possessing a homogeneity in cognition and values.

Future benefits

We have thus far reviewed some of the more immediate positive and negative outcomes (left half of Table1) from the deployment and widespread diffusion of digital tech-nologies. Our attention now turns to the more enduring benefits and costs, some of which have already begun to manifest themselves, associated with high tech (shown on the upper right half of Table1). Brynjolfsson and McAfee (2014)

observe that Information and Communication Tech-nologies (ICTs) are so-called general purpose technologies (GPTs) which serve as a base or platform for the develop-ment or advancement of other technologies. Nearly every product or service we use has some form of ICT embedded in it. With the advent of the internet of things (IoTs), such smart devices have become ubiquitous (Husain 2017; The Economist 2019).

Cars, homes and home appliances, stores, airplanes, luggage, electric grids, and much more, have been fitted with sensors to increase our ability to control them to our ends. This can be achieved by touch, voice, with a ges-ture, or, potentially, even with the blink of an eye. The use of ICTs in industry has helped increase efficiencies in produc-tion and service firms alike (Kvochko 2013), making goods (customized, if needed) available at competitive prices, and enhanced convenience at work and in leisure activities (Deb 2014). The automation of routine and low/middle-skill tasks is another dimension of AI which is likely to help in mitigat-ing the boredom and tedium associated with many manufac-turing and service jobs in particular.Perhaps, the most prominent development in the field is that of artificial intelligence (AI).

Though the field of AI has developed in spurts, tending to ebb and flow over time (Lee 2018), it seems to have gathered a head of steam recently, and is likely to play a prominent part in our lives (Lee 2018; Webb 2019).Based on increasingly deep neural networks which introduce layers of data analysis capabili-ties, AI could be of the supervised or reinforcement varie-ties (Walsh 2018; Anderson 2019; Ramakrishnan 2019). In the former, the starting point is an algorithm to sort data and guide the analysis, with refinements being made in the process based on comparing predictions against actual outcomes. For instance, in predicting stock prices or the occur-rence of a medical condition, if, based on a data set of tens of thousands of observations, predictions vary from real-ity, corrections are made autonomously, and

applied to the next batch of data, and so on, until a close enough match between reality and predictions is achieved.

In the case of reinforcement learning, no initial algorithm guides the ana-lytic process, which depends on machine learning from reams of past data and outcomes to predict outcomes from present data sets, and improving predictive capability in an evolutionary manner (Webb 2019). This kind of artificial narrow intelligence (ANI) is being used in stock selection, facial recognition, neighborhood surveillance to anticipate criminal activity, supporting medical diagnosis, identify-ing candidates for gene therapy, and so on (Adams 2017).

Robots, which have been programmed to carry out specified tasks based on voice commands, are now being equipped with machine learning capabilities, so they can respond, based on reinforcement learning (their own as well of others in their cohort) to unanticipated requests. Self-driven cars are another ANI development which may be on the verge of introduction on an experimental scale. Ride-sharing is expected to increase, resulting in fewer cars on the road, and sharply reduced carbon emissions. The number of elec-tric car models under development by the major automobile companies is an indicator of the likelihood of autonomous vehicles hitting the market, since electric cars are more amenable to being self-driven than traditional fossil-fuel-powered ones (Gardner 2016; Edwards 2019).

Potential negative outcomes

One of the likely immediate outcomes of automation, as with the development of efficiency-enhancing techniques in the past, is the possibility of rising unemployment. While this has been an ongoing feature of technological change historically, one can now envision as part of the "age of accelerations" (Friedman

2016) that up to 40% of existing low- and medium-skill jobs in manufacturing and service occupations will, by 2030, be performed by machines with minimal human intervention.

Not only does this bode ill for present-day types of jobs, as a McKinsey (McKinsey Global Institute 2017) study notes, but it could mean that the jobs likely to be created in the coming years (which would normally be performed by humans) will also be taken over by sentient machines. Actions such as job-retraining under-taken by governments, fostering of entrepreneurship, and an increase in the supply of highly skilled workers may have minimal impact (Arogyaswamy and Hunter 2019). It has been noted by some experts that new technologies often result in the elimination of certain types of occupations, while creating a variety of new ones (White 2011; Gordon 2016).

There is considerable evidence, however, that the new jobs created in the robotics/automation/AI revolution may be of the low-skilled, poorly paid kind, creating extensive underemployment. Current and emerging ICTs, are poised to transform societies in ways we have not hitherto experienced (Hirst 2014; Stettner 2018). The process might unwind over a few decades, but the writing is on the wall. If the tech oligarchs do not act in a manner respectful of social values and norms (e.g., paying their share of taxes, investing in worker retraining, accepting that they are not supra-societal enti-ties), social and political instability could be the outcome. Civil society and democracy may prove to be unsustainable (Collier 2015; Ma 2018; Lanchester 2019).

While the impact on employment could well be economi-cally damaging, AI built on 5G networks could change other aspects of life for the worse in the United States, China, and other countries to which this technology is transferred. There are

serious concerns about the efficacy and reliability of machine learning. One of the pitfalls is that many prob-lems are more complex than can be addressed by statistical analysis (Pearl 2019). Not only are the numbers of vari-ables extracted from the data likely to be dauntingly large, it might also be difficult to attach a conceptual meaning to each of the variables identified. Even more relevant, if the list of variables changes over time, the predictive power of machine learning could become even less effective. An equally valid criticism is that systems would remain opaque in regard to the process by which predictions are made.

A total dependence on statistical machine learning would make it impossible to explain why decisions are made and, even more serious, for human actors to exercise rational or moral discretion. Agar (2019) observes that following this path would create a new feudalism with users of Google and Facebook constituting the peasant farmers in an emerg-ing cyberland. Ethically, the increase in the number and scope of interactive technologies raises the issue of how we should deal with distributed moralities (Floridi 2013). For instance, in attacking military targets with possible civilian casualties or in denying social services to certain individuals, the human–machine interaction could result in machines making decisions involving moral choices, even if it is done unwittingly.

Similar moral choices might confront physicians whose diagnoses differ from those of machines, and, in fact, in any area where empathy, compassion, and morality are involved. That is, in a machine-learning world, human actors may not be the only ones involved in making ethical decisions.Combining the added heightened threats to employment, privacy, security, decentralization of power, the exercise of individual and group cognitive capabilities, and the potential sidelining of human rationality and morality, it would appear that, unless action is undertaken in the immediate future, societies worldwide will face transformative, destabilizing change.

"Self-regulation"

As the number of uploads to social media and search web-sites proliferates, and new products are introduced at an accelerated pace, keeping pace with the millions of new items appearing every day could become an insuperable task (Satariano 2019). The use of AI to monitor content may not lead to much improvement either, given how minor varia-tions in input could throw an AI system off track (Condliffe 2019 Employees of firms such as Google, Microsoft, and Amazon have occasionally attempted to influence corporate strategy (Dubal 2019), but not always effectively. Given the big tech culture of rapid and disruptive product introduc-tion regardless of likely consequences, the belief in their own infallibility, and the lack of diverse, possibly dissent-ing voices from within, (which Heisler (2018) views as one of the biggest risks to the continued success of big tech), organic moderation may be a chimera.).

Self-regulation, therefore, can have initial and limited effectiveness, but can quickly be overcome by the sheer magnitude of screening required, the demands of shareholders for growth and profits, acquiescent corporate cultures, and sheer hubris. To deal more effectively with the top challenges confront-ing big tech such as balancing the risks and rewards of AI, data governance and security/privacy, and a decrease in pub-lic trust (Forbes Technical Council 2018), some companies are taking long-overdue steps such as the appointment of a Chief Ethics Officer (Swisher 2018), adopting a code of ethics (West 2018), and teaching high tech ethics (Singer 2018). The fact that over 30% of executives out of 1400 surveyed ranked ethics as one of their top concerns regard-ing AI (Forbes Insights 2019) speaks to the concerns arising from the expanding reach of big tech.

When confronted with evidence of the harm wrought by their innovations, big tech firms often respond that the consequences were 'unintended'. As (Jasanoff 2016) notes, firms typically evaluate the gains primarily to shareholders and secondarily to other stakeholders. The possible negative ramifications of their decisions are generally not inves-tigated, given short shrift, or, worse viewed as beneficial to the firm even if the outcomes are likely to be harmful to specific constituents or society as a whole. Some researchers posit that, as technology becomes an increasingly dominant part of culture, the line between intended and unintended consequences tends to get blurred (Webb 2019). Conse-quences, even if unintended, are not necessarily unforesee-able. Firms focused on desirable and profitable outcomes alone, while failing to anticipate or ignoring undesirable, less profitable ones, are ill-equipped to regulate themselves (Vogelberg 2018).

Regulation

One of the policy proposals which has gained ground recently both in the EU and the US is regulation of big tech. For instance, the General Data Protection Regulation, or GDPR (2018), adopted by the European Union (EU) is an attempt to ensure privacy of user data. Though its interpre-tation and enforcement could create complex challenges, it might be a precursor of more regulations to follow in the EU as well as in the United States. It needs to be noted, however, that numerous hurdles exist to regulating tech businesses which are constantly mutating. Foremost among these is the issue of how to regulate products which do not yet exist, and whose revenue-earning method cannot be anticipated. An often-mooted suggestion is that the bigger tech firms should be broken up as were oil and railroad firms at the turn of the twentieth century, and AT&T in the 1970s (Lohr 2019a).

While the concept might be an appealing one from the anti-trust perspective, the difference here is that the tech giants have diversified considerably and the principle adopted to split them up could create even more problems (Morozov 2019). For instance, separating Google Search from You-tube, and both from Android could render each of these entities far less effective in meeting users' needs. Given Google's adoption of "free" services (advertising being the prime source of revenue), the costs to users could well rise, particularly since the synergies from sharing resources and information across platforms could be diminished. The interconnections among many of these firms' products make it difficult to decide where one product (e.g., Messenger) ends and another (e.g. WhatsApp) begins (Stahl etal. 2017). Legal battles are likely to ensue if a breakup were proposed (Isaac 2019).

Also, since Chinese firms, with the backing of their government, are engaged in a concerted effort to stake out a leadership position in the technologies of the future, it might not be seen as prudent to hobble big tech in the US and EU relative to foreign rivals, while possibly also reducing the level of service to users in these countries. In fact, American big tech firms often cite the national interest in arguing that they should not be tightly regulated (Roose 2019).

However, perhaps due to the rising dismay over the per-ceived indifference of big tech to the social, political, eco-nomic, and technological forces it has unleashed, the Justice Department, some state governments, and Congress have embarked on investigations, and lawsuits have also been filed (Smith 2019). The charges against major ICT firms center around their dominance in digital advertising and whether this violates anti-trust legislation. Though limited in scope (privacy, security, and social and political impacts are not specifically included), the very fact that regulation is under consideration in the U.S. [even if the efficacy of the process is in some doubt

(McCabe 2019)], has cast a shadow over the immediate future of the largest ICT businesses (Levy 2019).

While some CEOs of tech giants have welcomed regulation, partly due to the likelihood of barriers to entry being raised, and also because users typically sign off on any new conditions added to terms of service, the uncertainty over the direction of pending inquiries is a source of mount-ing concern (Wharton 2019). By building bridges to, and partnering with, governments worldwide, while anticipating and guarding against potential problems, big tech could (as Microsoft appears to have done) conform to societal norms and enhance shareholder value (Lohr (2019b); Ratnesar 2019).From around the early 1970s, maximizing shareholder value has been the single most important force driving corporate strategies for publicly owned businesses, and digital technology firms have focused predominantly on this criterion of performance. Big tech stock prices and market values have soared since the early 2000s, and have contributed significantly to a long-running bull market, before the outbreak of the Covid-19 pandemic.

It appears that the apparently irresistible rise in the values of big tech shares has declined somewhat (Kramer 2019). Increased monitoring by governments and activists, critical media coverage, concerns over accelerating automation, threats to privacy and security, the long-term impact of screen addiction on children, and so forth, might well be playing a part in investors' uncertainty over the future of major tech firms (Wursthorn 2019). Adding to shareholder anxi-ety concerning the prospects for firms like Apple, Google, Amazon, and Facebook, is the appointment by the E.U. of a "Digital Czar" who has vowed to expand investigations to include data appropriation and misuse, influence in elections, destabilization of society, and a whole panoply of other practices (Stevis-Gridneff 2019). Shareholders' concerns over

the threats facing big tech might well con-vince these firms to review the ethical problems associated with their actions.

User involvement and activism

The satisfaction of users' needs while guaranteeing that their rights are not violated is best done by users them-selves. Granted, users are fragmented in their expectations and often unclear about their rights. However, if the bulk of the user population remains indifferent to the kind of slippery slope individuals and societies are on now, no amount of regulation or "self-regulation" can be effective. Whether it is achieved through activism, concerted action by NGOs, or through consumer boycotts, or adverse publicity, users need to ensure that the aggregated, hid-den, and lasting harm done to individuals and to society is mitigated to the extent possible.

As behavioral econom-ics suggests, we might be willing to accept and discount future losses, however heavy they might be, to experience immediate gratification (Hardisty etal. 2012). Awareness of the perils of technologies which not only have multiple impacts but also are hydra-headed has to start from the toddler stage which is when many parents introduce their offspring to electronic entertainment and communication. For those who have become addicted to high tech services, weaning them off such behavior is far more challenging.

Digital addiction afflicts millions of people and may require treatment as a psychological condition, requiring the type of attention given to alcoholism or drug addiction (Glatter 2018; Gregory 2018). Privacy violations, security breaches, and posting of false and harmful information also need user (bottom-up) action to complement volun-tary corporate and regulatory efforts. The role played by activists such as Lady Kidron in galvanizing public opin-ion (Singer 2019) to restrain the

power of social media particularly where children are concerned is an instance of the type of action needed. To achieve any traction in the effort to restrain the overweening ambitions of, and the looming risks associated with, big tech, activism of this sort has to snowball, first, to create awareness, and then, to mobilize for action.

Conclusion

The ability to store, analyze, and act based on immense quantities of data combined with the advances in machine learning, presents us with unprecedented opportunities to strive for the betterment of humanity in many ways. Artifi-cial intelligence (AI) based on ever-deeper neural networks has the capability to transform medical care, revolutionize transportation, enhance security using sensory recognition, provide customized education, and so on.

Its impact on the world economy alone could amount to an astounding $17 billion or more. While initially dependent on human inputs and algorithms, deep learning could lead to machines which teach themselves based on the data which they are fed. As the scale and scope of artificial narrow intelligence proliferate apace, we may, in a few decades reach the Singularity of Artificial General Intelligence, and Superintelligence—a stage at which we may have little control over goals or decision-making, and even if we did, would hesitate to sec-ond guess our creations. We may, however, be nearing a' pre-singularity', the point at which decisions on how much control to cede and what moral limits need to be in place, are taken out of our hands. As IoTs and AI become inte-gral to our everyday lives, our powerlessness relative to big tech and authoritarian governments may become irrevers-ible.

It is imperative we reflect fully on the extent to which we are vesting our technologies with power over our lives both now (addiction, impacts on cognition, the

welfare of children, etc.) and into the future. The immediate benefits should not blind us to the extent to which individual rights, social justice, and the common good are likely to be harmed. Complicating the assessment of the societal ramifications of technology in the long run is that the AI/5G race between the big tech firms in the United States and China is one in which neither side is likely to pause lest the other gain an immediate advantage. The fact that China's big tech firms (Baidu, Alibaba, and Tencent are the most prominent) are viewed as arms of the state, adds a tinge of nationalism to the urgency with which AI is being developed.

The impact on the world of the 5G/AI revolution could well be as significant as the start of the nuclear age. In addition to regulation, the use of an ethical calculus, and safeguarding users' and other stakeholders' interests, corporate and national leaders need to negotiate and set boundaries for how AI will be used (Scharre 2019), rather than engaging in a race to gain the most financially, militarily, and politically.

7. Major Challenges

The international community and sovereign states are facing a number of basic structural problems that make it difficult to align Big Tech's commercial interests and genuine corporate responsibility. Under the existing corporate law and market governance system, the board members and corporate executives have a strict fiduciary duty to maximise the financial returns and shareholder value . The attention economy is all about profit being directly linked to screen time, ad impressions, and algorithmic engagement.

Thus, meaningful "Safety-by-Design" interventions such as disabling autoplay, removing infinite scroll, or replacing engagement-driven feeds with chronological timelines inherently reduce user retention and ad views. This creates a structural

problem where executives who willingly prioritise youth well-being are actively putting themselves at risk of cannibalising revenue, depressing stock valuations, and getting sued or kicked out by institutional investors for breaching legal duties.

Moreover, Corporate Social Responsibility (CSR) activities of Big Tech are often used as a defensive strategy to avoid binding legislation. Conglomerates invest huge resources into public CSR campaigns, mental health awareness pledges, voluntary safety tools such as optional, buried screen-time reminders. These self-regulatory mechanisms, however, are not legally binding and are structurally separate from the core algorithms that generate corporate revenues. Industry studies suggest that companies use CSR as a sort of "ethics-washing" to the effect of creating an image of self-governance that convinces international organisations and legislators that state intervention, such as mandatory safety audits or antitrust measures, is not needed.

The decline of global youth mental health is, from a classical economic point of view, a massive uncompensated negative externality. Big Tech companies privatise multibillion-dollar commercial gains from engagement-maximizing platform designs but shift serious downstream financial and social costs (e.g., increased psychiatric hospitalisations, school dropouts, crisis interventions, and lost future economic productivity) onto public healthcare systems, national budgets, and families. Since these public health costs do not impose direct financial or legal liability on corporations, there is no built-in incentive from market forces to alter the predatory business models.

Finally, one of the most profound challenges in enforcing corporate responsibility is the extreme opacity of corporate data and systemic information asymmetry. Tech companies are talking to lots of people and groups at UN meetings.

They are on panels that talk about being a good company. But at the time they are not letting people see the information they have about the people who use their products, they are not sharing the details about how their products work and they are not sharing what they know about keeping people safe. Some people who used to work for these companies are telling us that they have documents that show the companies know their products can cause problems for teenagers like making them feel bad about their bodies, getting them hooked and even making them think about killing themselves.. The companies are not telling the people who are supposed to help keep us healthy about these problems. Because of this the people who are supposed to be watching these companies cannot do their job and make sure the companies are being responsible and make the people in charge answer for the things that are happening.

8. Questions to be Addressed

1-To what extent should Big Tech companies be held accountable for the negative mental health impacts of their profit-driven algorithms on youth?

2-Should there be binding international regulations on addictive digital design, or should this remain under national control?

3-Is it ethical to monetize user attention when it leads to addiction, anxiety, and depression among adolescents?

4-How can "safety-by-design" principles be implemented without harming innovation and economic growth?

5-Should minors have special digital protections, such as restricted algorithm exposure or platform limitations?

6-How can global cooperation prevent regulatory gaps and the exploitation of youth in less regulated regions?

7-Are current healthcare systems capable of addressing digitally induced mental health issues?

8-Should Big Tech companies contribute financially to mental health solutions and interventions?

9-Is self-regulation by technology companies sufficient, or is external enforcement necessary?

10-What would a realistic human-centric digital ecosystem look like, and how can it be enforced globally?

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