United Nations | United Nations Economist Network

NEW ECONOMICS FOR SUSTAINABLE DEVELOPMENT

ATTENTION ECONOMY

INTRODUCTION

The concept of attention economy[1] was first coined in the late 1960s by Herbert A. Simon, characterizing the problem of information overload as an economic one. However, the concept has become increasingly popular with the rise of the internet making content (supply) increasingly abundant and immediately available, and attention becoming the limiting factor in the consumption of information. See Annex 2[1]. While the supply of accessible information has continued to grow rapidly - digital data roughly doubles every two years - the demand for information is limited by the scarce attention we can give to it. Indeed, the total available attention is limited by the number of people with access to information[2] and the fixed number of hours in a day and conflicting demands on our time and attention. Davenport and Beck (2001) first define the "economics of attention" as an approach to the management of information that treats human attention as a scarce commodity and applies economic theory to solve various information management problems[3]. We are increasingly living in an "attention economy" rather than an "information economy".

By the 2000s, so much information was being generated worldwide that only a small fraction (0.5% in 2015) of the digital data generated was being analyzed at all. This made information relatively cheap, while the "price of attention" has risen much faster since the advent of the internet in the 1990s. The response by the industry was the introduction of new technologies to automate online data collection and analyze user interactions and processes, popularized as "big data", which has driven much of online traffic since the 2010s. Adding artificial intelligence (AI) to automate the internet - equivalent to adding hundreds of millions of workers in the form of online robots - increasingly overcame the constraints to process data. These content management technologies have added much value to data allowing entirely new data-focused business models, but have also led to an information overload on systems and individuals.

MAXIMIZING ENGAGEMENT TO ADDRESS LIMITED ATTENTION

To address the scarcity of people's attention, these technologies have been increasingly aimed at strategic capture of private attention aided by systematic collection and analysis of personal data, which has become a very profitable business model. Digital platforms started gathering very large numbers of data points about their users to sell to external users (particularly advertisers) for profit. Business models capturing and monetizing people's attention and data, mostly without users knowing, were made possible by the lack of regulation to protect users as described in Prof Zuboff's several writings on Surveillance capitalism. Advertisers pay as a function of viewers (attention) which is maximized by engagement in content (e.g. videos on YouTube, feeds on Facebook).

This data turbo-charged economy — for all its pervasiveness — is hard to measure. Individuals do not explicitly pay a price to use the platform, yet their data, content, and attention is sold on opaque digital markets preventing individuals to know the true value of their attention and data. Digital services are usually provided for "free" by platform so no explicit market value is revealed. However, by any measure, the size of the global attention economy is on the order of trillions of US dollars. For the USA alone, Evans estimated it at US$7.1 trillion and 437 billion hours in 2016, whereas Brynjolfsson and Oh estimated the consumer surplus from TV at 10.2% of GDP and from the Internet at 5.8% GDP or combined at US$3 trillion (average for 2007-2011). For comparison, the revenues of the five big tech companies (Facebook/Meta, Google/Alphabet, Apple, Amazon and Microsoft) were about $1.4 trillion in 2021 and their profits increased by 55% in that year alone. According to the industrial Internet report of GE, this economy could add US$10 to 15 trillion to the global GDP over the next few decades.

This brief on the yellow economy aims to address these risks posed by the extraction and monetization of attention through a shift of the current attention economy to Yellow Economy.

A more conscious and intentional attention economy would lead to:

- A more regenerative economic model where all stakeholders benefit, and inequalities are minimized to the benefit of society and nature;
- Relying on technology design and a business model that is people-centered and intention-based, not attention-based;
- Acknowledging human nature, social engagement and the exchange grounded in the truth of wholeness rather than fractured aspects of the human experience and people's activities in the world; and
- Minimizing the addictive nature designed in the current extractive based approach in favor of maximizing transparency and awareness of how best to interact with digital ecosystems to promote individual well-being.

ECONOMIC, SOCIAL, AND POLITICAL IMPACT

Huge levels of data are owned by large digital platforms with significant societal and economic impact. This has allowed these big tech companies - now the most capitalized companies in the world[4] - to acquire unprecedented power in the functioning of national and global economy. Equipped with big data and artificial intelligence, they can also detect and eliminate nascent competitive threats, further consolidating their power and delaying innovation and individual welfare. But also, the power to intermediate civic engagement and influence political discourse as the recent debate over Elon Musk acquiring Twitter demonstrated.

With their asymmetric bargaining power, digital platforms tend to underpay content developers requiring intervention of the State as the Australian-Facebook fight over how much content providers are compensated demonstrated.

On the social side, the erosion of individuals' control of their own personal data has a profound effect on the human psyche, influencing people's beliefs, how they relate to the physical world and creating a sense of information overload. The way data are currently valued in these markets create a race to grab individuals' attention at the lowest possible cost. This degrades the experience leading to maximizing the time users spend on a platform at the expense of an individual's well-being and even affecting individuals' intentions. Indeed, to maximize profits, algorithms are programmed to increase engagement by maximizing virality of the content, which often promotes highly "incendiary, controversial, or polarizing" content to drive interactions. This increases exposure to unhealthy content often based on mis- or false information, significantly impairing conscious decision-making and risks creating addiction, desensitization and radicalization.

On the ethical side, with the consolidation of descriptive, behavioral, and predictive data, a detailed digital profile of each of us can be built that duplicates us as accurately as possible, and therefore acts as a "human digital twin"[5]. To a large degree, these human digital twins already exist allowing for "commodifying and selling our behavior patterns like futures contracts". The lack of consent required to use these twins combined with emerging understanding that data are an integral part of individual identity creates ethical issues. Indeed, in his address to the UN General Assembly in 2021, UN Secretary-General Antonio Guterres identified the growing reach of digital platforms and the use and abuse of data as one of the greatest perils that humanity faces[6]. Intention is being impaired and eroded as most users of digital platforms are unaware of the algorithms working in the background that increasingly disempower them to act in their own best interest.

On the political side, with access to tremendous amounts of personal data, governments and malignant groups can manipulate people's behavior, violating human rights. Also, normalization of hate speech and radicalization of individuals over time lead to polarization and social unrest and undermining democracies[7]. In addition, traditional news media businesses have struggled to compete with the digital platforms that are monopolistic in nature - the more people are on a platform the more people and businesses will go to that platform. This makes the cost of entry for later comers - often local platforms in developing countries - insurmountable. The domination of a few large digital platforms is also increasingly luring advertising revenues away from local media, displacing locally relevant news and sources of information in addition to diverse points of view.

EXISTING GLOBAL AND/OR REGIONAL GOVERNANCE FRAMEWORK OR AGREEMENT

The UN Member States recognize the importance of people's right to privacy in the digital age and adopted a General Assembly resolution 68/167 on 18 December 2013, underscoring the right to privacy is a human right and affirming, for the first time, that the same rights people have offline must also be protected online. And in the General Assembly resolution 75/176 of 28 December 2020, Member States reaffirmed the importance of the right to privacy in the digital age, expressing concerns that individuals often "do not and/or cannot provide their free, explicit and informed consent to the sale or multiple resales of their personal data." The resolution also includes language on concerns regarding artificial intelligence's requirement of large amounts of data, often relating to personal data, which can pose great risks to the enjoyment of the right to privacy.

A better approach to measure the yellow economy is needed, in line with the call of the UN Secretary-General Antonio Guterres' in "Our Common Agenda" — supported by Member States during the President of the General Assembly's consultation — to review GDP as a measure of progress to ensure it measures what people care about. The UN is exploring how to support Member States in measures of progress beyond GDP including environmental issues and non-paid work, but also "free" digital services, and economic, social, political and human rights impacts of digitalization. The Secretary General has also tasked the UN Tech Envoy in developing, in consultation with member State, a Global Digital Compact. This creates opportunities to promote responsible governance of data and digital platforms, to limit information overload that obscures individual intent, and to mitigate risks of the extraction and exploitation of behavioral data and knowledge by digital platforms and other actors, and the current and potential impacts on public welfare and individual rights.

Member States have also already adopted the United Nations Educational, Scientific and Cultural Organization (UNESCO) Recommendation on the Ethics of Artificial Intelligence that "recognizes the profound and dynamic positive and negative impacts of artificial intelligence (AI) on societies, environment, ecosystems and human lives, including the human mind, in part because of the new ways in which its use influences human thinking, interaction and decision-making and affects education, human, social and natural sciences, culture, and communication and information" in 2021. It represents the very first global standard-setting instrument to protect and promote human rights and dignity. It further recognizes that AI technologies have the potential to be beneficial to the environment and ecosystems, but that achieving them can also amplify tension around innovation, asymmetric access to knowledge and technologies, including the digital and civic literacy deficit that limits the public's ability to engage in topics related to AI, as well as barriers to access to information and gaps in capacity, human and institutional capacities, barriers to access to technological innovation, and a lack of adequate physical and digital infrastructure and regulatory frameworks, including those related to data, all of which need to be addressed.

UNCTAD has a mandate to increase the use of the 2015 United Nations guidelines for consumer protection | UNCTAD updated to include online consumer protection, as well as to look into competition policies related to the sector.

RELATIONSHIP WITH OTHER NESD CONCEPTS

The current attention economy, an offshoot of the digitalization of the economy, has global reach and is embedded in our daily life. As a direct-to-individual or direct-to-business marketing platform, there are very low barriers for engagement in the attention economy. If the monopolistic nature of platforms and the lack of consent in the use of our data is addressed, the proposed Yellow economy could be seen as a democratic economic system that gives equal access to individuals, MSMEs and large corporations. Current business extractive and manipulative models are so by-design and could thus be redesigned/programmed to be regenerative, becoming a powerful force that puts the world on a sustainable development path.

It could support entrepreneurs in the Green, Blue, Orange, and circular economies networking them among themselves and with consumers. It could facilitate financing, if individuals regain control over their attention and data they could allocate their attention, time and money to social causes and platforms aligned with their values. It could support the exchange and sharing of services and goods for the social and solidarity economy (SSE). It could also support the objectives of these economies, by "nudging" consumers towards environmentally and socially responsible behavior. Additionally, it can help speed up the Frugal Economy whereby users would choose to "give" their attention, data, and intellectual property to solve particular problems to co-create solutions with others online. This is significant as only a combination of technologies, institutions, economic incentives and behavioral change will allow us to effectively achieve the SDGS.

However, to make beneficial use of data-intensive online technologies, including a range of AI technologies, their significant energy use would also have to be addressed. In 2019 the Financial Times reported that global digital activities contribute to around 4% of global greenhouse gas emissions, 37% higher than in 2010, and could reach as high as 21% in 2030. It would take the planting of over 1.6 billion trees to offset the pollution of email spam alone[8]. At the moment, the world is headed in the wrong direction where attention is being extracted from people with insufficient concern given to the impact it has on their well-being and social cohesion. Large social media platforms negatively impact the Orange Economy by not adequately rewarding the independent creators who originally generated the attention, data, content, and/or ideas. The extractive model also leads to greater funding of illicit activities and misinformation as cultural values and minimum principles are not being upheld.

Sustainability is ultimately about "meeting the needs of the present without compromising the ability of future generations to meet their own needs"[9]. This could also serve as an overall guiding principle for assessing policy action and

regulations of the Yellow Economy by asking to what extent the current, super-connected, attention seeking digitalized economy supports our ability to consciously advance the SDGs or not. This would be akin to the UNESCO's recommendation that member States conduct ethical impact assessment, to identify and assess benefits, concerns and risks of AI systems.

IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT AGENDA AND LINKAGES TO SPECIFIC SDGS

IMPACT ON PEACE, JUSTICE AND STRONG INSTITUTIONS

The current model of the attention economy is detrimental to peace, justice and strong institutions, or SDG16[10]. It thrives on unlimited online interactions and information overload, often employing citizen's digital twins without their knowledge and with the aim to affecting their intention. In addition, in countries that do not regulate data use, individuals are often left with little to non-existent power over the entities which manage their digital lives and potentially exploit their attention.

Failure to protect individuals' information and privacy means the information can fall into the hands of bad actors or be exploited by governments for political reasons. This can lead to increasing authoritarian and surveillance regimes, with the ability to greatly influence collective human behavior by controlling the flow of information and exploiting human vulnerabilities[11]. The risk is even higher when, as we saw above, large social media platforms have siphoned off profits from high-quality journalism and media companies, leaving population without reliable sources of information.

The current business model is based on maximizing engagement, often based on disinformation, with no incentives to curb outrageous or false content, on the contrary, outrage creates more engagement. In turn, incendiary and hate speech has been associated with radicalization of users, polarization, and social unrest. The impact on democracy is illustrated by the January 6 Capitol riots in the United States fueled by misinformation about the 2020 election or the January 8th, 2023 riots in Brazil similarly fueled by misinformation around the 2022 election.

Thus, rules must be in place to control outrage and harmful behaviors online to address well-being and human right of individuals as well as waning trust in institutions, governments, journalism, and media around the world. Guiding the attention economy towards truthfulness, quality of information, and quality of time spent for better citizens and communities' decisions could therefore help to advance SDG16.

IMPACT ON SOCIAL NORMS AND BEHAVIORS THAT DETERMINE SDG PROGRESS

Moreover, digital platforms can be used to encourage social norms and behaviors that are consistent with gender equality, sustainable consumption, climate actions and environmental conservation (SDG5, 12, 13, 14 and 15). They can help empower individuals and companies to meet their own SDGs, advance public goods, allow artists to derive a decent living wage from their arts, and allow the social and solidarity economy to thrive through sharing of tools and services on platforms within cooperatives or between corporations, for instance.

IMPACT ON MENTAL HEALTH AND PRODUCTIVITY

Reforming the current extractive attention economy model that focuses on luring individuals to spend maximum time on platforms and bombarding them with highly addictive and incendiary content would also help support achievement of:

- SDG4 that covers mental health and wellbeing[12].
- SDG8 by reducing time on digital platforms can help to improve productivity of workers.

A renewed Yellow Economy could also support SDGs in indirect ways. Appropriate taxation of the digital economy, supported by accurate assessment of how much, and where, economic gains are created, would generate new financing for sustainable development efforts, especially in fiscally constrained developing countries. Properly measuring attention economy's impacts on society based on values will lead to greater incentives for corporations to invest resources in innovations that align with ethics and avoid leading to addictive or other counterproductive behaviors. With greater tools to express their intentions and values, individuals will be better incentivized to increase the quality and accuracy of their personal data, which will in turn lead to higher functioning and more accurate platforms and services.

IMPACT ON DECISION-MAKING AT BUSINESS AND SOCIETAL LEVELS

A higher consciousness, people-centered, technically sound and ethically designed model will also serve to enhance the value of the Yellow Economy to businesses and organizations. Integrating proper design/technical implementation standards will help provide a workable and readily available framework for programmers, who design the backbone of the digital economy. The cost, volume, and expertise needed to manage the gargantuan troves of data generated within the growing digital universe has led to vast data inaccuracies with one *Deloitte report* highlighting that over 50% of 3rd party data used in advertising was less than 50% accurate. Thus businesses are more likely to receive inaccurate data from 3rd party data providers for advertising. As more and

more decisions are made based on this inaccurate data, the impact on society becomes frightening as corporations or other decision makers are investing vast sums of their financial resources to support a dysfunctional system which they have a false sense of accuracy into. Reducing the inaccuracies of this data through empowering individuals to own, manage, and benefit from the Yellow Economy will in turn benefit businesses through greater transparency of the value of what they are transacting off.

Empirical findings on the dynamics of "collective attention", through aggregate supply and demand for information points to an accelerated shortening of the *collective attention span* to issues of concern. For example, attention at the societal level spikes as new content receives lots of traffic/attention at first, leading to higher demand for information, driving its supply up, and in turn further increasing attention. But, evidence suggests narrowing peaks of collective attention over time (not just at the individual level) indicating a "*social acceleration*" with wider and poorly understood societal and political implications. Data on this social acceleration are scarce but seems to be in line or co-evolves with similar acceleration in technology change. Just to give one example, in only three years from 2013 to 2016, the time a hashtag stayed in the global daily top-50 on Twitter contracted from 17.5 to 11.9 hours. Compared to any other known social trends, this is an incredible speed of change not boding well for global problem solving.

INTERACTION OF THE ECONOMICS OF ATTENTION AND MAINSTREAM ECONOMICS

The current attention economy model treats human attention as just another factor of production — a resource to exploit. As a result, we see the same extractive and exploitative tendencies to capture profit as we see with 'environmental externalities', putting economic gain over human well-being and flourishing of the public good.

When factoring in the concept of human digital twins, it becomes easier to visualize the labor associated with their active use by advertisers and thus the need for adequate considerations and protections. Even treating human attention like other factors of production may not be justified from a mainstream economic perspective, as it remains unclear if attention should be considered labor, commodity or a new type of factor of production altogether. On one hand, attention can be perceived as labor — activities done on digital platforms generate a surplus that is monetized by the platforms. On the other hand, from the perspective that attention is captured and monetized through being converted into personal data, there is an argument for treating attention as a new type of factor of production — one with economic properties that distinguish itself from labor, capital and technology and therefore requiring updated analytical tools. This brief presents ideas and principles factoring in attention as its own type of resource, integral to the value of a system and contributing to well-being.

Technology, algorithms, shopping and media platforms are the engine of the attention economy. Direct contributions to the GDP have been calculated in the trillions, but we have not yet estimated the harm it creates. The growing economic potential of this economy is reflected in the significant rise of the cost of capturing attention in the last two decades and the multi-billion-dollar valuations of companies with business models based on exploiting that data. The UN workstream on measures of progress beyond GDP must include the negative externalities/impact of this extractive model.

Moreover, insufficient attention has been given to the people responsible to implement the technology - programmers. A reshaping of the attention economy needs to involve them so that they become a part of the proposed solutions. It is important to understand that technologists at large, and programmers, are to be regarded as the next generation of rights defenders. The current lack of technical guidance in the shape of, for instance, taxonomies or readily available libraries, is a main impediment to their involvement.

We need to develop theory around the economic interests of "users" distinguished from the *de facto* conditions of experiential dispossession, datafication, control, and commodification introduced in the attention economy, and enforced by its unique and ever-widening power. The new Yellow Economy model must support new forms of collective action to solve local and global problems[13].

ADVANCING A SUSTAINABLE ATTENTION ECONOMY: POLICY DISCUSSIONS

The attention economy is globally ubiquitous, and many have called data the new currency. Given all individuals use their attention every day, and their data should be seen as a digital representation of their physical selves and therefore an extension of their being, how the attention economy evolves will have an enormous impact on people's well-being. Research and pilot projects into the development of "human digital twins" provides a glimpse of the not-too-distant future.

Policies need to be introduced to eliminate persuasive techniques used by advertising, and social media that manipulate subconscious human behavior by exploiting biological imperatives linked to survival instincts. The economic growth model linked to quarterly earnings that incentivize consumption fuel the use of these methods. We need a governance structure of that incentivize well-being and mutual benefit for all stakeholders rather than the current model that incentivize exploitation of individuals turning them into 'objects of consumption' instead of recognizing individuals' human

rights. Principles to guide these policies and the transitions are provided in Annex 1.

Making the attention economy compatible with sustainable development requires addressing the fundamental issue of digital platform governance. Global efforts are needed for government regulations of these platforms to be truly effective for the benefits of everyone and to better maintain important online spaces and data as public goods. Updated competition policies can help address excessive market power concentration of platforms that can exacerbate inequalities and injustice,[14] and to make the platforms more amenable to changes that are in public interest, especially as Web 3.0+ advancements that empower personal ownership come to fruition. Adoption and implementation of updated consumer protection policies and attention literacy are also crucial so online rights are protected. Additionally, addressing how the attention economy evolves around the spatial web, or the mixed-reality universe, will also be a paramount concern given the increasing blending of our physical and digital worlds.

Data governance must go hand in hand with digital platform governance. There needs to be more concerted effort worldwide to improve data protection, proving intent and consent, improving transparency about data collection and use, and clarifying data ownership. Legislations should allow individuals to "provide" their attention with respect, acknowledging their right to choose and freedom from exploitation, and supporting health and well-being. We need to develop a new model, including of how algorithms are designed, that gives users the capacity to control their personal and behavioral data, shifting the current online paradigm so that brands would need to subscribe to individuals, or the chosen representors of those individuals obligated to act on their behalf (digital self), and ensure individuals have control on how much or little they want to be exposed to advertisers or any other client of their data. We should also consider when individuals could be paid for their data.

This would require a shift in underlying business model that acknowledges mutual benefit or reciprocity for all stakeholders and move from an extractive towards a regenerative model encouraging sustainable consumption and production and wise use of resources[15].

The EU General Data Protection Regulation (GDPR) is currently the most stringent privacy and security law in the world. It was drafted and passed by the European Union but imposes obligations onto organizations across the globe (as long as they target or collect data related to people in the EU — citizens or residents). Israel, Japan, New Zealand, Argentina, Turkey, Uruguay, and Canada have legislation deemed adequate for EU data export. Kenya, Uganda, Mauritius have legislation similar or inspired by the GDPR. Qatar, Bahrain, South Africa, Nigeria, South Korea, Brazil, also have legislation. The US and China are also developing their own legislation that may not all be coherent with the EU model. Because these models have spillover effects in other jurisdictions, they should be developed in an universal environment, such as at the United Nations, to ensure all affected countries and parties have a voice and legislations are coherent among themselves.

THE GDPR RECOGNIZES EIGHT RIGHTS OF THE DATA SUBJECT

The GDPR recognizes eight rights of the Data Subject: The right to be *informed*

1. The right to be *informed*
2. Right of *access*
3. Right to *rectification*
4. Right to *erasure*
5. Right to *restriction of processing*
6. Right to *data portability*
7. Right to *object to processing of personal data*
8. Right not to be *subjected to automated decision, including profiling*

Given that individuals and the generators of economic resources like attention, data, and content are often exploited without awareness of the resulting negative externalities associated with their consumption and production in the current attention economy system, we need to increase awareness and protections of those individuals. Without individuals having greater ownership and transparency over their attention resources, vast liberties can be taken by external actors against an individual's best interests, with profound harm done to that individual and societal well-being.

In order to raise awareness, we could, for instance, develop easy-to-understand interfaces that communicate to users how their data is being collected and used, engaging them in their right to choose, and clarifying ownership and value in the exchange. This would require advertisers to actually address personal needs, supporting their values and respecting their privacy preferences.

We also need to raise awareness of programmers, improving attention literacy, and transparency in the "behind the scene" design guided by general principles. Annex two lists some proposed principles that could guide this transition.

We also need more ethical and value-based AI, which — if adopted — will create more value for businesses as it will lead to more sustainable practices that are adaptive to cultural changes and more accurately reflect the health and quality of markets. Currently, AI algorithms and content moderation are often employed to manipulate attention. For example, people falsely believe they are getting objective data when using search engines, while in fact algorithms have been applied to create filter bubbles to select information a user would like to see based on information about the user, such as location, past click-behavior and search history. Therefore, another important question to ask is whether it is appropriate to use technology to influence user behavior for commercial gain. More discussions among stakeholders are urgently needed to deliberate on this issue. In the meantime, countries and companies should be encouraged to implement the UNESCO's recommendations on the Ethics of AI and the UN guidelines for consumer protection. Law professors Ryan Calo and colleagues also proposes going beyond ethical standards to include policy and binding rules to enforce it to ensure beneficial use of AI, including the future of healthcare, work, criminal justice, and ethics[16].

Policy formulation must be commensurate with the scale of the attention economy and its impact. We need to find ways to measure the negative externalities generated by the current attention economy model such as the costs of information/misinformation overload, addictive engagement, and prevalence of online child pornography on inequality and labor market outcomes. We also need to estimate the value created from individuals' attention so that we could estimate fair remuneration and include it in measures of "Beyond GDP" as called for by the 2030 Agenda.

Much more investments are needed in research to close the knowledge gaps on global collective behavior arising from the attention economy. Without better understanding of the complex system, there may be ever more serious challenges to addressing social issues, safeguarding a functioning democracy and competently identifying and implementing high-impact actions to address global crises. For instance, should robots be taxed to provide universal basic income for employees they displaced? Ultimately, scientific progress as such might be challenged itself. Against such a background, Bak-Coleman and colleagues argue "that the study of collective behavior must rise to a 'crisis discipline' just as medicine, conservation, and climate science have, with a focus on providing actionable insight to policymakers and regulators for the stewardship of social systems.

There are at least 6 areas where more research is needed to advance a regenerative model of the attention economy or the Yellow Economy:

A. Ethics, which covers issues such as the appropriateness of commodifying attention, the addictive nature of current digital platforms, the extent to which digital platforms are allowed to influence people's behavior with or without their explicit knowledge; and the legality vs democratic right of authorities accessing our data for "national security" reasons.

B. Economic mechanics in the attention economy, which covers topics such as how to leverage the attention economy to promote sustainable consumption and production, and what is the ideal market structure and pricing model in the attention economy to be a driver to achieve the SDGs;

C. Regulatory mechanisms to update existing regulations and analytical tools in view of the changing dynamics in the attention economy;

D. Attention literacy, which covers how to improve people's understanding of the ways their attention can be manipulated and be exploited for profit;

E. Better data governance, including what data should remain in the public domain, and impact on cross-border relationships and the potential rise of digital colonialism;

F. Impact on marketing and advertising business models; and

G. How to address the fact that algorithm cannot reflect human values such as fairness, accountability and transparency.

Annex 1: CONSCIOUS ATTENTION ECONOMY PRINCIPLES

Principle 1. INDIVIDUAL SOVEREIGNTY

- **Attention Sovereignty.** Individuals should retain self-determination, ownership, access and control of self-generated attention economy data and content captured based on human interaction behavior, with the ability to revoke access for any reason.
- **Right to Reward.** Individuals should have the reasonable capability to understand, earn or allocate a significant portion of the rewards generated from the value of their attention and data.
- **Globalism – Digital Colonialism.** All individuals, regardless of where they reside, should be treated with equity, entitled to adequate access, protections, and remuneration through means that are culturally relevant and abide by international law.
- **Fiduciary Responsibility of Delegated Data Managers.** An individual should be able to safely delegate their data and content management to a 3rd party with expertise who is responsible for attention economy resource management. Third parties should have the binding responsibility to act in accordance with the individual's expressed intentions in alignment with the principles of well-being, reciprocity, and harmlessness.

Principle 2. HARMLESSNESS

- **Respectful of Dignity.** Content should not violate human or digital rights, exploit individuals, or expose them to extremism or extreme violence, promote extreme fear, anger and hatred, or promote harmful behaviors to vulnerable groups.
- **Respectful of Time.** All stakeholders should ensure the amount of time an individual is encouraged to spend in an attention-based system is proportionate to providing high quality well-being to that individual. All stakeholders should ensure there is rigorous analysis supported by unbiased 3rd parties proving the time spent by an individual in an attention-based system is being minimized or eliminated whenever that impact is negative.
- **Intentional by Design.** To prove intent, no decision-making actions should be taken without proving alignment with the original individual's and stakeholder's intentions, and any new decision or action must gain additional transparent consent regardless of prior transparent consent has been given.
- **Purposeful by Design.** All attention economy stakeholders should be able to always define and express their purpose behind the use of an attention economy resource and should be required to present the purpose to any other stakeholder upon request.

Principle 3. PRIVACY & DATA PROTECTION

- **Data Minimization.** Collection of personal and behavioral data by stakeholders should be minimized, even if not legally required, to prevent exploitation of vulnerabilities.
- **Inherent Privacy.** All attention-based technology and decisions should be based on ensuring individual privacy and well-being.
- **Portability.** User choice requires portability for identity, data, payments, and any other services. Individuals should be able to interoperate across providers without losing their identity information, social graph or content.
- **Protection from Artificial Intelligence.** The design of AI systems should ensure that individual attention economy resources are protected throughout the life cycle of the system and representation is accurately reflected in datasets with a minimum level of bias. AI systems must not exploit people, their digital twins, social data, or content and should be regularly checked by unbiased human sources to ensure adherence to humane values.

Principle 4. TRANSPARENCY

- **Transparency of Access.** Attention data shared between stakeholders must be accessible and comprehensible at a reasonable level of understanding and technical expertise to ensure all stakeholders can choose to act in accordance with their own values.
- **Transparency of Risk.** Individuals should be fully notified with meaningful explanatory information that empowers them to explicitly include or revoke access before their attention data influences background decision-making by human or AI processes.
- **Transparency of Economic & Social Value.** Individuals should have the right and capability to request economic and social impact information from any stakeholder which manages or monetizes their attention economy resources in a manner that is easy to comprehend.
- **Trustful by Design.** Stakeholders should build trust into their products

and services by exposing assumptions and allowing users to adjust their experience to satisfy their personal values.

Principle 5. ACCOUNTABILITY

- **Governance.**
  Appropriate audits, impact assessments, and due diligence mechanisms, including whistle-blowers' protection and 3rd party analysis of bad behavior, should be developed to ensure accountability for all attention economy resources and processes.

- **Supporting Civil Discourse.**
  All stakeholders should ensure their efforts and operations actively support high-quality civil discourse based on quality information and develop laws that are proactive in respecting human attention, personal sovereignty, and diverse perspectives.

- **Standard Metrics.**
  Establish new attention-based economic metrics that showcase positive impact, improved well-being, social and cultural awareness, and reciprocity as a measure for success and in alignment with UN Agenda 2030 and its 17 SDGs based on scientific accuracy with long term goals set for longer timelines.

- **Shared Standards.**
  Establish stringent yet open standards, interoperability, and taxonomies to facilitate collaboration across attention economy stakeholders. The standards should be regularly evaluated for flaws and consistently updated by multiple human sources to reflect needed changes to address those flaws.

Principle 6. FAIRNESS & INCLUSIVITY

- **Common Infrastructure.**
  Tools for public conversation should exist outside of private companies as common infrastructure, like the Internet itself, certain tools, such as, Identity Management should be established as common infrastructure usable by all stakeholders.

- **Social Fairness of Benefits.**
  Stakeholders should promote equal access, social justice, safeguard fairness and promote non-discrimination ensuring that the benefits of the attention economy are available and accessible to all. Stakeholders should also prevent the replication of inequities in the digital world that reflect inequities in the physical world.

- **Supporting Quality Journalism & Information.**
  Attention economy stakeholders should ensure local, national, and international journalism and content are adequately funded, supported with attention economy resources, and given the freedom to act independently in order to promote fairness and inclusivity in societies.

- **Equitable Access to Quality Journalism.**
  Access to quality journalism should not be contingent on ability to pay for services and people's attention economy resources should be equally respected in free spaces as paid services.

Principle 7. FREEDOM FROM EXPLOITATION

- **Avoiding Psychological Manipulation.**
  Attention based systems are at risk of trapping individuals in psychologically harmful behaviors through feedback loops that exploit the human desire for stimulus and can be addictive. All stakeholders should ensure they promote psychologically sustainable ideas and behaviors. Similarly, stakeholders should avoid promoting behaviors that devalue self-worth and use attention to achieve goals not aligned with an individual's personal values or that manipulate them into behaviors they would otherwise choose to avoid.

- **Exploitation Awareness & Prevention.**
  All attention economy stakeholders agree to prevent exploitation for any reason, at all times, and in all spaces whether physical or digital, even if those platforms or systems were not intended for those individuals as the primary audience. Additionally, there should be special considerations and protections for children and the elderly in all attention-based systems.

- **Fraud Awareness.**
  All attention economy stakeholders should ensure the prevention of relevant types of fraud such as ad-fraud, identity fraud, technology fraud, bot-traffic, and content-fraud, and only acquire resources from trustworthy and audited sources.

- **Balanced.**
  Stakeholders, from professional or User-Generated Content (UGC) sources, should endeavor to meet a high standard of quality and accuracy of information and promote quality journalism from diverse sources to support credible narratives.

Principle 8. HARMONY WITH NATURE

- **Generative Systems.**
  All attention economy platforms and systems should embody mutual respect, mutual benefit, ac-

cessibility, do no harm, and be an instrument for the common good.

- **Environmental Impact.**
  All attention economy stakeholders should promote, embody, and embed practices that improve the health of our environment by reducing wherever possible the environmental impact of data processing, business operations, and human behaviors that stem from the attention economy including media promotions, greenwashing, and the downstream impact advertisements and content have on promoting unsustainable behaviors. Stakeholders should understand the emissions tied to their attention economy operations and the impact those operations have on supporting healthy wild ecosystems.

- **Environmentally Responsible Media Production.**
  All media and content generated by or for an attention economy stakeholder should be produced in an environmentally responsible manner and ensure human, animal, and natural rights + values are respected throughout the production process. How nature and wild ecosystems are depicted in media is important, and media professionals should ensure diverse wild ecosystems are well represented, promoted, and protected.

- **Nature & Wildlife as a Stakeholder.**
  Wildlife imagery should only be used when the wildlife benefit in some way as they are entitled to reasonable compensation in exchange for value. Attention economy stakeholders should make attention economy resources available to wildlife protection groups.

Principle 9. ATTENTION LITERACY

- **Explainable**.
  Attention Economy decision-making should be intelligible to its intended audience so that all individuals and stakeholders can understand the impact of their interactions and realize their intentions.

- **Public Awareness.**
  Education should be available for individuals to gain greater agency over their own attention to ensure individual control and decision-making power for effective public participation. In this way all members of society can make informed decisions about their use of attention economy resources and be protected from undue influence.

- **Professional Awareness.**
  Education for professionals in the attention economy should include training and access to tools and information to help professionals understand conscious attention economy principles and the impact of make ethical decisions to meet conscious attention economy-based and UN SDG aligned business goals.

- **Mis-information Literacy.**
  Stakeholders agree to expose and educate the public about disinformation content, to limit the ability for technology and bad actors to spread false or misleading content.

Principle 10. ADAPTIVE SYSTEMS

- **Cultural & Technological Preparedness.**
  Attention economy stakeholders agree to take precaution by developing efficient and effective methods that respect individual rights and conscious attention economy values, with capacity to adjust as cultural values evolve regarding human and digital rights, shifts in technologies, cultural changes, vulnerabilities, and new regulatory burdens.

- **Re-imagining Attention Based Business Models.**
  In order to meet the goals of the UN SDGs, current attention-based business models must evolve to better align profit goals with human values and ecological needs to support a regenerative economy. Financial return on investment must better coincide with the return on impact to society of the investment and reward those who build trust between buyers and sellers and leverage attention to enhance healthy communication over those who exploit attention to extract value from people and nature.

- **Resource Sharing.**
  Attention economy stakeholders should make a reasonable effort to share innovations with other stakeholders that would benefit society and nature at large. Large-scale stakeholders should share resources with smaller stakeholders in areas that promote sustainability, inclusivity, ethics, and well-being to ensure barriers to ethical decision making are not determined by monetary constraints.

- **Future Proofing Education & Learning.**
  All stakeholders must educate their respective ecosystems on new technologies, methods, and systems entering their sector or domain with equal weight given to the positive and adverse effects they may have to the economy, regulatory landscape, environment, and culture within communities. Organizations and governments should continuously interface with professionals who can focus on the long-term implications of technologies and processes with the capacity to disseminate the knowledge to their peers and communities.

ANNEX 2: CONSCIOUS ATTENTION ECONOMY DEFINITIONS

- Attention Capital - Financial investments and/or financial returns based on capturing value from attention data.
- Attention Data - The combination of personal and behavioral data collected while individuals are engaged online.
- Biomimicry - The design and production of materials, structures, and systems that are modelled on biological entities and processes.
- Content - The flow of information produced to garner attention in order to achieve a goal and any production costs or gains associated with it
- Data Algorithms + Tools & Artificial Intelligence - The technical processes and technologies used in capturing, analyzing, and acting on data inputs.
- Digital Attention Infrastructure - Interactable content or infrastructure within digital ecosystems designed to capture attention data and influence behavior.
- Digital Ecosystem - An electronically connected space in which individuals and enterprises can directly interact with no intermediary.
- Data Inputs - The raw data generated by a stakeholder and/or initial data included in a process. The data captured through online engagement by individuals. This could be both identifying data or behavioral data such as time spent browsing a particular site.
- Data Outputs - The processed data developed from refining the data inputs. Data produced by processing and analyzing raw data inputs.
- Data Sovereignty - The ability for an individual or entity that produces an original dataset to be identified as the rightful owner-of that data with the ability to steward and monetize the data they have cultivated with maximum autonomy.
- Digital Twins - The digital representation of an individual or physical entity inclusive of all representations of that person or physical entity in a digital medium.
- Ethical Research, Templates, Language, and Frameworks - Guidelines for algorithms, content and technical design that are oriented towards individual attention safety and well-being.
- Generative - Having the power or function of generating, originating, producing, or reproducing.
- Harmlessness - The quality of being unable or unlikely to cause damage, offend or harm someone.
- Human Experience - The totality of attention by an individual or group of individuals interacting with a space and/or entity and its returned impact.
- Human Labor - Work performed by people in the process of developing and supporting the attention economy.
- Individual Attention - The immediate time spent with mental perception of an occurring phenomena (can be conscious or subconscious).
- Intention - In relation to the attention economy refers to the expressed interests, desires, and actions of an individual or stakeholder that contributes attention economy resources to a system.
- Metaverse - A virtual-reality space in which users can interact with a computer-generated environment and other users.
- Metric & Accountability Systems - How success is measured in relation to attention, data processes, and well-being.
- New Attention-Based Legal Frameworks - Government policy that establishes and protects individual rights, prevents exploitation of all stakeholders and establishes the legal means to ensure reciprocal benefit for all stakeholders.
- Overweb - Refers to the decentralized public space above the webpage. More specifically, the portion of this meta-layer above the web page where people can meet and interact directly through content.
- Patents & Proprietary Acknowledgements - Ownership of attention economy resources by a stakeholder which is in alignment with conscious attention economy principles.
- Physical Attention Infrastructure - Physical technology, physical ecosystems and/or physical tools utilized to support the attention economy and/or capture attention (ex. newspapers, phones, headsets, billboards, etc.).
- Portability - The ability to move between platforms that perform the same services without losing any personally- generated data.
- Psychologically sustainable ideas and behaviors - Mental well-being manifested by healthy behaviors and feelings of fulfilment and happiness such as awe,

connectedness, self-expression, love, hope, stress-reduction, and knowledge.

- Purpose - In relation to the attention economy refers to the reason why an individual or entity expressed an intention.
- Reciprocity - A situation in which two people, organizations or countries provide the same help or advantages to mutually benefit each other
- Regenerative - Relating to the improvement of a place or system, especially by making it more active or successful, or to making a person feel happier and more positive.
- Social Networks - Social systems with multiple stakeholders where individual attention is utilized as a currency for community engagement (does not need to have monetary value).
- Spatial Web - Refers to a computing atmosphere that exists in a 3D space. It is a pairing of real and virtual realities and accessed through the interface of Virtual and Augmented Reality.
- Web 2 - Also known as the social web, this layer of the Internet refers to websites that emphasize user- generated content, ease of use, participatory culture and limited interoperability (i.e., compatibility with other products, systems, and devices) for end users.
- Web 3 - A layer above Web 2 that supports user transition into becoming individual stakeholders with self-sovereign rights over their intentional content and attention alongside greater interoperability.
- Well-being - The overall quality of the human experience as being healthy and positive.

Endnotes:

1. We chose the yellow color because it is believed to stimulates the left side of the brain, which promotes logical thinking. It encourages us to home in and make informed decisions. When we feel our grip on reality slipping, yellow reminds us that our perceptions are warped. The yellow chakra is believed to be related to personal power and self-esteem. When this chakra is balanced, a person exhibits confidence, reliability, responsibility, purposefulness, and motivation. Yellow, in the Spiral Dynamics also represents 'systemic-thinking, multi-perspectival stage. https://en.wikipedia.org/wiki/Spiral_Dynamics.
2. Attention economy. https://en.wikipedia.org/wiki/Attention_economy#cite_note-3
3. Two thirds of the world population is online today.
4. Ibid, Attention economy.
5. Seven largest in terms of market capitalization are: Microsoft, Amazon, Alphabet, Alibaba, Facebook, and Tencent. Source: UNCTAD Digital Economy Report 2021. https://unctad.org/system/files/official-document/der2021_en.pdf
6. Human digital twins are complete data representations of the real human counterpart which continuously controls, monitors and optimizes its physical twin status.
7. SG António Guterres. 21 September 2021. "Secretary-General's address to the 76th Session of the UN General Assembly". https://www.un.org/sg/en/content/sg/speeches/2021-09-21/address-the-76th-session-of-general-assembly
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12. Global Witness. 23 June, 2021. "Algorithm of harm: Facebook amplified Myanmar military propaganda following coup". https://www.globalwitness.org/en/campaigns/digital-threats/algorithm-harm-facebook-amplified-myanmar-military-propaganda-following-coup/
13. Also, some jobs in the attention economy have been deemed as high risk as individuals have to spend their days watching horrific videos to determine whether they meet the platform guidelines as the AI is still learning and are woefully inadequate at preventing human and digital rights abuses.

[14] Ibid, Shoshana Zuboff.

[15] Internet search market is controlled 90% by Google, while Facebook controls 66% of the global social media market. Source: UNCTAD Digital Economy Report 2021. https://unctad.org/system/files/official-document/der2021_en.pdf

[16] As this is a relatively new concept, please see list of definitions/concepts in Annex One.

[17] Ryan Calo, Lane Powell and D. Wayne Gittinger. 2017. Artificial Intelligence Policy: A Primer and Roadmap., University of California, Davis. Vol 51: 399-435. https://lawreview.law.ucdavis.edu/issues/51/2/Symposium/51-2_Calo.pdf

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