IGF Internet Governance Forum

Dynamic Coalition on Internet & Jobs

RESPONSIBLE INTERNET USAGE

2022

Message

The Internet is now an integral part of our daily routine, and for those reading this, our lives revolve around the Internet and mobile devices. As we say, there is a digital footprint in all we do on the Internet; there is also an equivalent carbon footprint of the digital footprint, be it sending an SMS, WhatsApp, an email, browsing, or conducting a conference. No wonder the climate crisis is aggravating beyond our comprehension, and internet usage could also be a contributor to the degradation, so it is time to reflect and take steps to check our digital footprint and the consequent carbon footprint.

This is the first report from the Dynamic Coalition on Internet & Jobs (DC-Jobs) on this crucial topic of 'Responsible Internet Usage.' It serves as a primer for debate and further studies to create awareness and sensitization so that we become responsible in our actions to leverage the Internet. Responsible Internet Usage is a multi-dimensional topic and directly impacts the environment, economy, and society.

I look forward to your views on building this further and taking to every internet user through the world's most impactful forum on the issues concerning the Internet; The Internet Governance Forum.

Kind regards,
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Responsible Internet Usage

Four inventions—fire, wheel, electricity, and the Internet—have revolutionized and fast-tracked economic growth. The Internet has transformed the world and become indispensable to our daily routines. Although it has shrunk the geographies and drastically impacted all domains/sectors, its real impact is yet to be realized, as we are still in the early years of Internet technology and have a long way to go. Nevertheless, we have indeed already experienced many advancements; however, these were so fast and swiftly ingrained in our daily lives that they went unnoticed and we could not foresee the incoming positive and negative impacts. While we are trying to switch to digital economies and digital democracies, we must take a step back and examine the carbon footprint of these developments so that we become responsible species and use the Internet to positively impact humanity and the planet. It is high time we move from focusing merely on economic growth to aiming for holistic techno-socio-economic development. Overall, the three words—"technology," "society," and "economy"—will majorly cover critical aspects of what we call "Responsible Internet Usage."

Internet Infrastructure

The Internet is an overarching term that covers hard and soft infrastructure, including the items listed in the following sub-sections.

Internet of Things (IoT) and Cloud Storage

With the invention of the IoT, connected devices (laptops, smartphones, etc.) tagged with sensors and software have become an integral part of our lives. Earlier, we stored data on desktop hard disks, but since datasets got complex, off-premises storage and web-based software, such as cloud-based storage, became more popular. The transition from physical CD-ROMs to software-enabled enterprises provides real-time software upgrades, remote access, and centralized data storage. *Today, data access is not restricted by physical location. If data are stored online, a carbon footprint is left every time we access them while we are on the move.*

Network

The introduction of 3G network into the market spawned a new age of communication and connectivity. Subsequently, a further enhanced "new age" version was brought about by 4G network, which facilitated abandoning of computers and allowed users to stream videos, make purchases on an e-commerce website, and use social media. Next, when the use of social media shifted to smartphones, it evolved to real-time broadcast of events. These platforms were not limited to individuals: businesses, organizations, and governments started leveraging them. The number of social media users globally grew from 970 million in 2010 to 2.9 billion in 2020 (StarInvestor). Further, the recent introduction of 5G network is not aimed merely to cater to the consumer demand for faster Internet speed; rather, it is expected to help handle connected devices (IoT devices) in homes, enterprises, and cities, along with helping people involved in agriculture, automobile sector, and health care. *With 5G and emerging technologies, the virtual world will become more energy intensive than the physical world.*

Metaverse

Over the past few years, we have witnessed extraordinary innovations, from shifting to smartphones to a rise in data, including the expansion of artificial intelligence (AI) and social media. In the decade ahead, additional fundamental changes may occur as data latency declines and AI algorithms advance. As the world has progressed tremendously in the last few years, much-hyped Metaverse could be the future of the Internet. Nobody knows what it will bring to the virtual world, but one thing is certain: *Metaverse will consume enormous bandwidth and generate enormous data.*

Factors Affecting Internet Usage

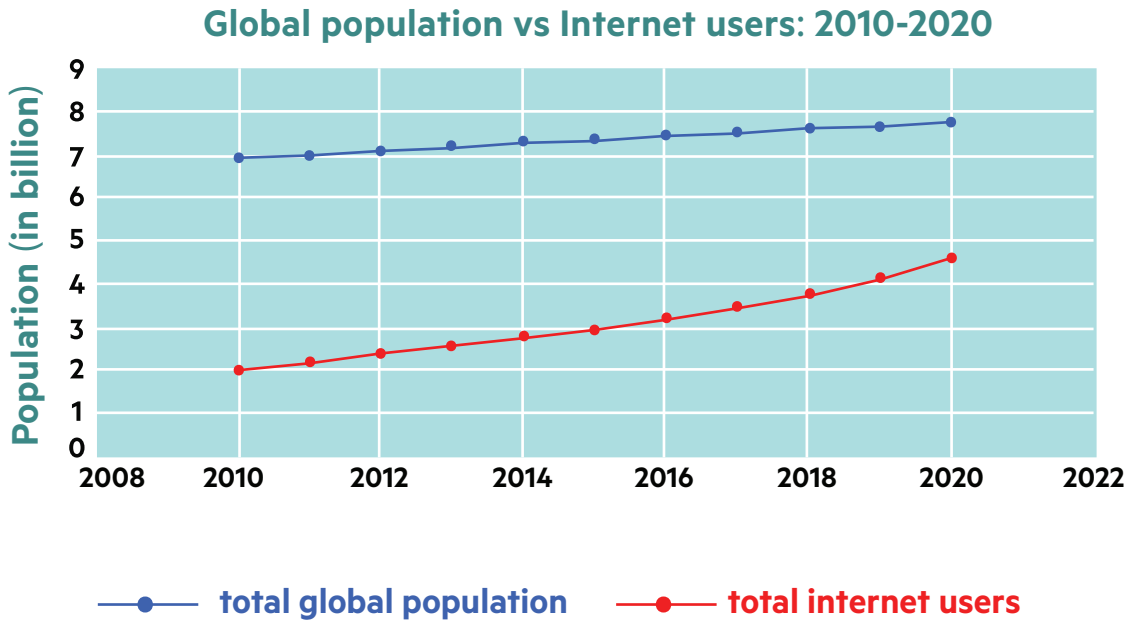
COVID-19

The pandemic hit the world in 2020. Workplaces were shut down, flights were grounded, and people had to shift to online mode. Moreover, technology became a lifeline for many; however, at the same time, the digital carbon footprints increased. In 2020, Internet traffic increased by more than 40% globally due to social networking, video conferencing, video streaming, and online gaming (Kamiya, 2021). Wheares, in 2021, 63% of the world's population i.e. around 4.3 billion people, used the internet (International Telecommmunication Union).

GIG Economy—Tasks

Although the Internet witnessed some positive outcomes that made our lives easier, such as generating employment in tech, enabling real-time connectivity, and easing information accessibility, each of our clicks generated carbon emissions that we either forgot or neglected. With all this involvement of the Internet in our professional and personal lives, we forget how our habits damage the environment at the back end. Online payments, app usage, web searches, and social media generate gigabytes of data. Every minute spent on web surfing, social media scrolling, or video streaming adds to the global digital carbon footprint.

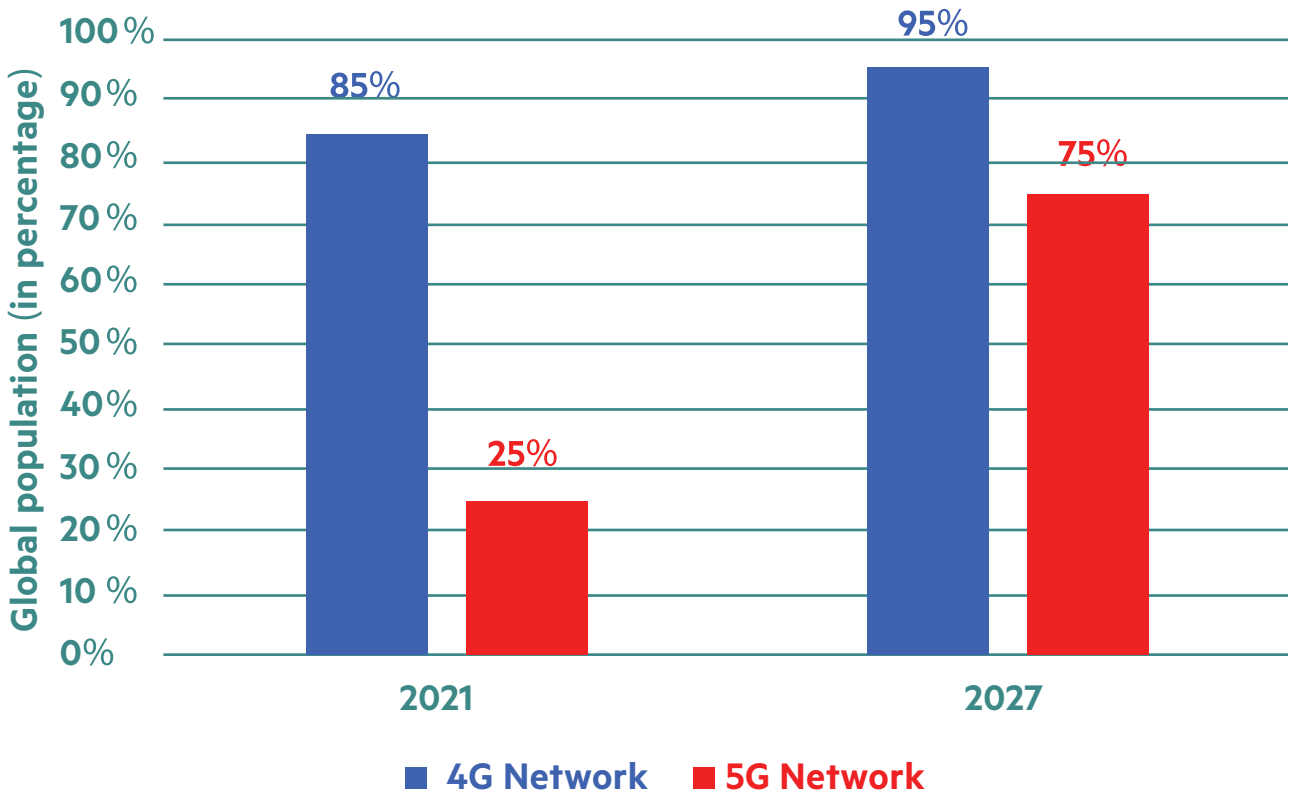
Figure 1:



Source: Statista: Total population (Statista, 2022) and number of internet users worldwide (Statista, 2022)

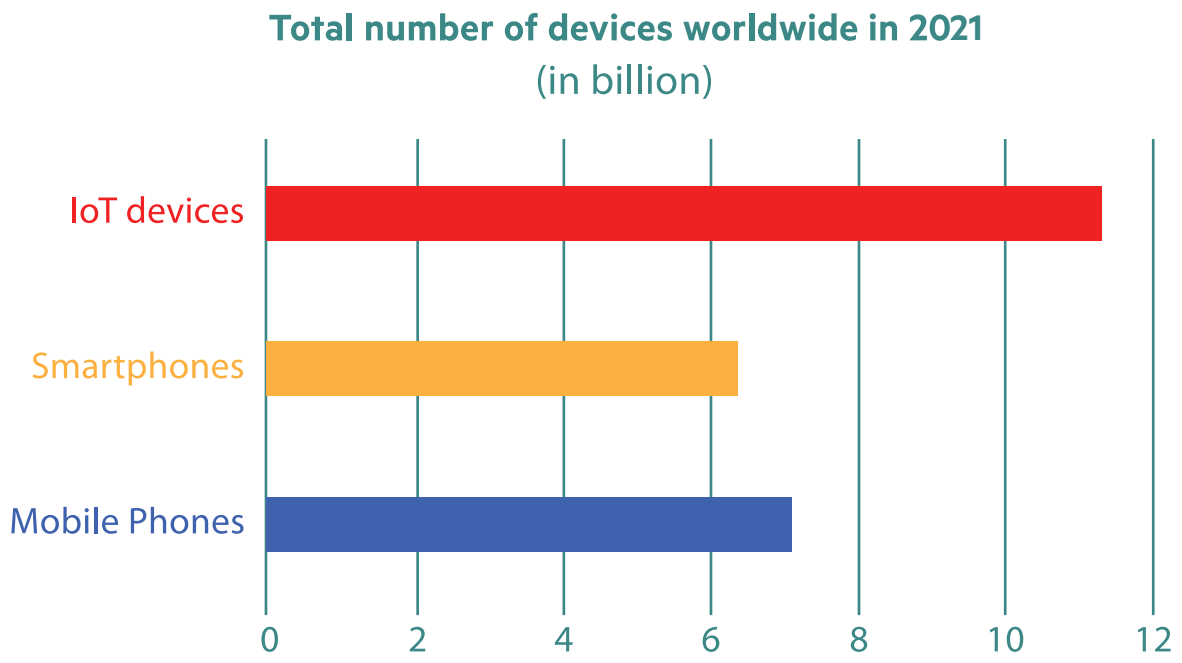
With the gradual increase in availability of the Internet and affordable access to it in many parts of the world, the gap between the global population and global Internet users will decline, as the trends after 2017 show. (Figure 1)

Figure 2:



As the reach of the Internet improves and the cost comes down, the onus of using the Internet responsibly will increase. In 2021, 4G network coverage reached around 85% of the world's population, and is predicted to reach approximately 95% of the global population by 2027. Notably, 5G population coverage reached at about 25% of the global population in 2021, 18 months sooner than the time taken by 4G to reach the same share of the population; further, it is predicted to reach around 75% of the global population by 2027 (Ericsson, n.d.). (Figure 2)

Figure 3:



Source: Statista, BankMyCell (Vailshery, 2022) (Statista, 2022) (bankmycell, 2022)

With rise in the number of devices, we begin to rely increasingly on them for our daily tasks. The 5G network, operating faster than its 4G counterpart, will play a critical role in fulfilling those demands. *Increased coverage, the growing number of IoT devices, tech-enabled solutions, network traffic, and data transfer speed will lead to exponential growth in carbon emissions generated per capita.*

Data Centers

Currently, there are 7.2 million data centers worldwide. The maximum number of data centers is in the United States (2,670), followed by the United Kingdom, Germany, China, the Netherlands, Australia, Canada, France, and Japan. In 2020, these data centers consumed 200–250 terawatt of energy: more than the energy consumption in countries such as Nigeria, Colombia, Argentina, Egypt, and South Africa (Rooks, 2022).

E-waste

In 2019, 53.6 million metric tonnes (Mt) of e-waste was generated globally (International Telecommunication Union, 2020). E-waste is hazardous to human health and the environment if not managed sustainably. *As our life is becoming increasingly dependent on tech, resultant e-waste will soon become a massive challenge.*

Despite campaigns aimed at creating awareness about switching off appliance, light, fan, and AC when not in use, we need to be careful and take personal responsibility for how they adversely impact the environment. However, with the advancement of technology, little did we realize our influence on the environment and climate change. We must now consider various crucial factors when determining how we use resources, including the amount of data we use and the number of devices we own.

The digital economy constitutes 15.5% of the global gross domestic product (GDP), increasing at a rate of two-and-a-half times faster than the global GDP over the last 15 years. We live in a time when online video usage accounts for 60% of global data flows and emits more than 300 million tons of CO_2 annually (The Shift Project, 2019). Nevertheless, we can still rescue our planet from global warming by adopting a responsible use of digital devices, the Internet, and data handling. *The Internet will become the most significant contributor to climate crisis if we do not understand the issue and not take individual, organizational, and governmental actions.*

Carbon Emissions

Mentioned below are some indicative references on the impact of our digital actions on degrading the planet we live on (Berners-Lee, 2020):

7 tonnes CO_2e world average, by a person	10g CO_2e per hour on average-efficient laptop	0.3g CO_2e short email sent from laptop to laptop
	0.8g CO_2e single text message	
	5.6g CO_2e, 5 minutes of web browsing from a smartphone	
	68 million tonnes CO_2e by all cryptocurrencies in 2019	
	0.2g CO_2e from single tweet	
63 kg CO_2e a year, use of phone one hour a day	160 million tonnes CO_2e in 2020 from the Cloud and the World's data centers	68g CO_2e per hour on gaming PC with screen

Carbon Emission	Worldwide Trend (Per Day)	Total Carbon Emission (Per Year)
Phone usage of 1 hour/day: 63 kg CO_2e/year	*3 hours and 15 mins of phone usage by a single person*	*74.733 tonnes per person*
Single text message: 0.8 g CO_2e	*23 billion texts*	*6.716 million tonnes*
A straightforward search: 0.5 g CO_2e	*8.5 billion searches*	*1,551,250 tonnes (approx. 1.5 million tonnes)*
An email: 0.3 g–26 g CO_2e	*306.4 billion emails sent and received*	*8,300.1–719,342 g per person*
A Zoom call: 2–50 g CO_2e	*55 billion hours*	*110 billion–2.75 trillion g*
Single tweet: 0.2 g CO_2e	*500 million tweets*	*36,500 tonnes*

Responsible Internet Usage—The Way Forward

Digital Carbon Footprint and Best Practices to Minimize It

The online ecosystem is growing fast, but the environment is paying a heavy price for this expansion. On the one hand, the world is talking about using AI to fight climate change; on the other, we are using the Internet irresponsibly. Digital technologies generate 4% of total greenhouse gas emissions. The spread of the Internet is limitless. The Internet has transformed our lives in such a way that today even cars can be driven through the Internet. One thing has become clear: the worldwide efforts to combat global warming have started gaining momentum. Yet, to encourage a broader public participation, we need more realistic, practical, and simple solutions. We all can begin using technology in sustainable ways to lessen our collective digital carbon footprints. *We must live consciously with a low-carbon lifestyle, if not a carbon-neutral one.*

As Internet users, we can significantly increase the environmental friendliness of our digital lifestyle by integrating the following activities into our lives:

Observing Self-Discipline

Ownership- Reduce the number of digital devices owned. By owning multiple digital devices, we might be unnecessarily living on the Internet. A device's existence itself has an enormous impact on the environment. In other words, a device does not generate carbon emissions only while in use; one must consider the ecological rucksack: the raw materials extracted from nature, the energy produced (grey energy), and carbon emissions resulting from the manufacture of that product and the e-waste it generates. *We need to adopt a minimalist approach to owning digital devices.*

Usage- Minimize number of hours on the Internet. There are many side effects—from physical to psychological—of using gadgets excessively. It is advised to

- Mute unnecessary notifications.
- Set daily usage time for social media.
- Check phones at intervals: practice digital fasting or intermittent digital fasting.

Engagement - Reduce number of responses:

- Avoid unnecessary and back-and-forth responses/ messages/ emails/ forwarding.

- Whenever possible, prefer group conversation/conferences to avoid extra communication.

Opting for Green Internet Habits

- When Wi-Fi/GPS/Bluetooth is not in use, turn it off. When you are not using devices, unplug or turn them off. In case of a PC, put it on hibernate/sleep mode if you are not using the device for a few minutes, but for more than 30 minutes, shut it down.

- The size of the screen you browse or watch on should be only as large as necessary. Whenever possible, watch videos on smaller screens, preferably with low brightness, as larger screens and higher brightness consume more electricity.

- Change your app settings to turn off apps running in the background. Even when a device is not in use, carbon emissions are generated due to running of apps.

Choosing Wi-Fi Over Mobile Networks

Internet connection with Wi-Fi is more energy efficient than with 3G/4G networks. Shut off the Wi-Fi at home and office when not in use/at night.

Going for Environment-Friendly Web Search

- Look up for environment-friendly search engines.

- Prefer a phone call over video calls whenever possible.

- Save your important tabs as favorites instead of searching repeatedly.

- Avoid sending unnecessary or too many emails or messages.

- Sort your emails and messages.

- Share a download link from your cloud instead of sending large files. As the files only need to be uploaded and downloaded once, this conserves energy, storage, space, and processing power.

- Delete all inactive accounts on social media if they are no longer in use.

- Prefer downloading the content you watch often instead of steaming it online every time.

Selecting Eco-Friendly Phone Settings

- Switch your settings from HD to a lower resolution when it is not necessary to take a quality picture.
- Turn off automatic downloads (for apps, downloads), including cloud backups that are not required.
- Turn to “power saving” or “eco” mode.

Ensuring Responsible Content Usage

- Limit and filter out your content, as the regularly watched content sets the algorithm of the particular social media platform accordingly. More content consumption leads to more Internet usage.
- Fact-check before putting any content on social media or before starting any conversation on any platform.
- Beware of false narratives and avoid indulging in meaningless conversations that can add to carbon footprints unnecessarily besides creating a societal divide or/and unrest.
- Refrain from commenting unnecessarily on social media platforms.
- Practice responsible usage of the content on any platform.

**Do not underestimate the impact of your Internet usage on the environment.
Let your responsible Internet usage drive development and
not degrade Mother Earth.**

References

bankmycell. (2022, September). *How many smartphone are in the world*. Retrieved from bankmycell: https://www.bankmycell.com/blog/how-many-phones-are-in-the-world

Berners-Lee, M. (2020). *How Bad Are Bananas*? : *The Carbon Footprint of Everything*. Profile Books Ltd.

Ericsson. (n.d.). *Network Coverage Outlook* . Retrieved from ericsson: https://www.ericsson.com/en/reports-and-papers/mobility-report/dataforecasts/network-coverage#:~:text=Global%204G%20population%20coverage%20was,networks%20deployed%20across%20the%20world.

International Telecommunication Union. (2020). *Global E-waste Monitor 2020*. Retrieved from itu.int: https://www.itu.int/en/ITU-D/Environment/Pages/Spotlight/Global-Ewaste-Monitor-2020.aspx#:~:text=A%20record%2053.6%20million%20metric,Mt%E2%80%8B%20in%20five%20years.

International Telecommunication Union. (n.d.). *Statistics*. Retrieved from itu.int: https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Kamiya, G. (2021). *Data Centres and Data Transmission Networks*. International Energy Agency.

Rooks, T. (2022, January 24). Big data centers are power-hungry, but increasingly efficient.Retrieved from dw: https://www.dw.com/en/data-centers-energy-consumption-steady-despite-big-growth-because-of-increasing-efficiency/a-60444548

StarInvestor. (n.d.). *Number of global social media users 2010-2021*. Retrieved from starinvestor: https://statinvestor.com/data/22389/number-of-social-media-users-worldwide/

Statista. (2022, July 27). *Number of internet users worldwide from 2005 to 2021*. Retrieved from statista: https://www.statista.com/statistics/273018/number-of-internet-users-worldwide/

Statista. (2022). *Number of smartphone subscriptions worldwide from 2016 to 2021, with forecasts from 2022 to 2027*. Retrieved from statista: https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

Statista. (2022, February 23). *World*: *Total population from 2010 to 2020*. Retrieved from statista: https://www.statista.com/statistics/805044/total-population-worldwide/

The Shift Project. (2019, July 11). Climate Crisis: *The Unsustainable Use of Online Video* . Retrieved from theshiftproject: https://theshiftproject.org/en/article/unsustainable-use-online-video/

Vailshery, L. S. (2022, August 22). *Number of Internet of Things (IoT) connected devices worldwide from 2019 to 2021, with forecasts from 2022 to 2030*. Retrieved from statista: https://www.statista.com/statistics/1183457/iot-connected-devices-worldwide/#:~:text=The%20number%20of%20Internet%20of,billion%20IoT%20devices%20in%202030.

Project: **Responsible Internet Usage**

(draft for public consultation)

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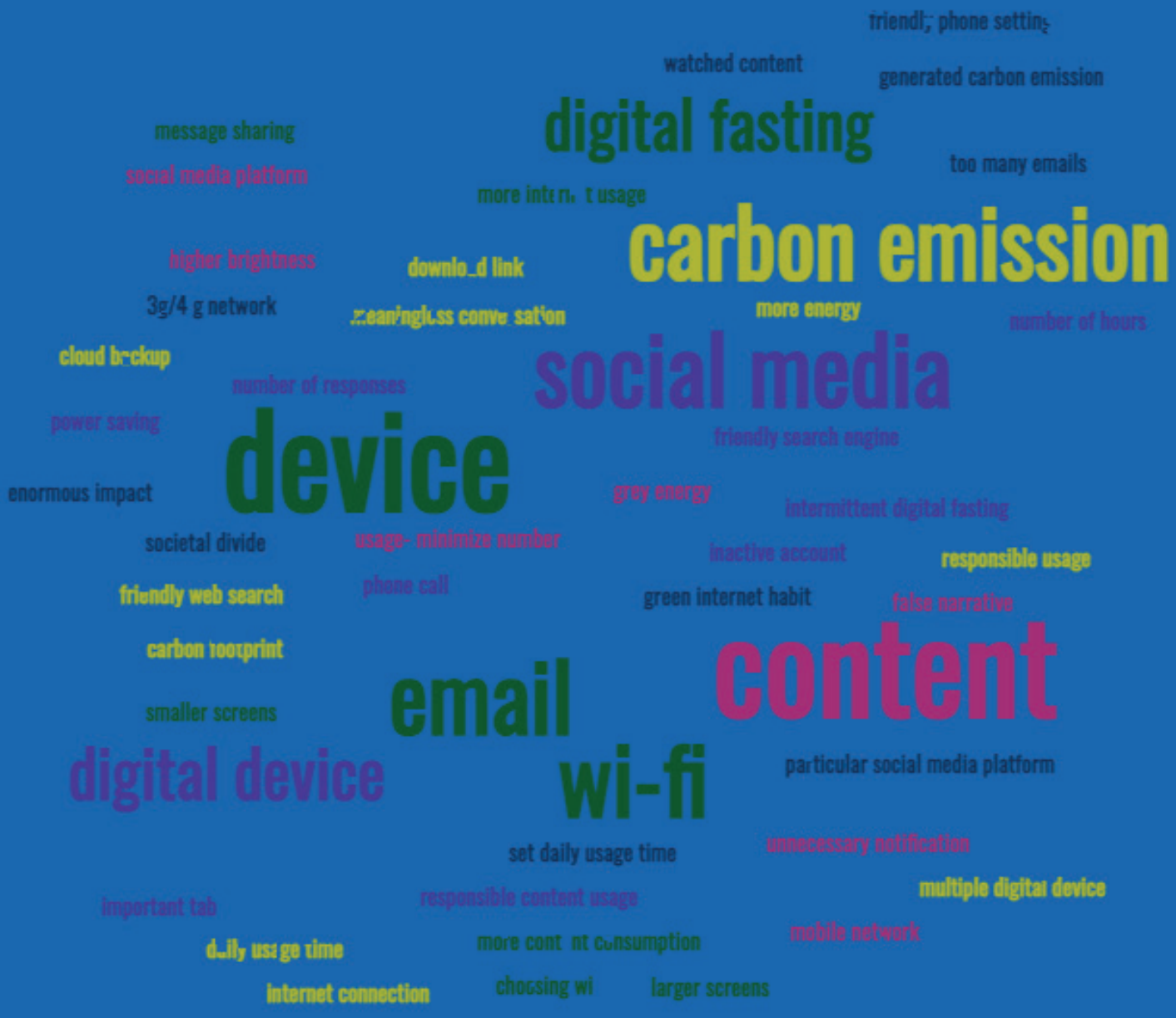
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power saving
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grey energy
intermittent digital fasting
societal divide
usage- minimize number
inactive account
responsible usage
friendly web search
phone call
green internet habit
false narrative
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important tab
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