International Journal of Sustainable Development Goals

www.ijsdg.org
eISSN: 3080-5023

Digital Ethics as a Preventive Framework for Combating Digital Drug Addiction ''An Analytical Study within the Cyberspace Environment''

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ARTICLE INFO

Article history:
Received 14 October 2025
Received in revised form 10 December 2025
Accepted 15 December 2025
Available online 27 December 2025

Keywords:

Digital Ethics, Psychoactive Substances, Digital Drugs, Digital Addiction, Cybercrime.

ABSTRACT

In today's digital age marked by rapid technological change and the remarkable growth of Artificial Intelligence, digital technologies have become deeply integrated into people's daily lives across different societies. Although these technologies were initially created to improve human well-being and advance social progress, their misuse by certain groups has resulted in negative and ethically troubling outcomes. One of the most concerning examples of such misuse is the emergence of digital drugs—auditory or visual stimuli that produce psycho-physiological effects similar to those of traditional narcotics. Even though they are intangible, digital drugs carry risks comparable to those of physical substances, especially when there is a lack of moral discipline, digital responsibility, and social accountability. In this context, the current study aims to explore how digital ethics can serve as a preventive framework to reduce the dangers of digital drug addiction and encourage responsible digital conduct within the larger social and behavioral landscape sciences.

1. problem statement

The digital era has been characterized by an unprecedented advancement and sophistication of digital technologies, driven by the continuous evolution of the human intellect. Consequently, contemporary and future generations have become deeply dependent on digital systems, to the extent that life without them is almost unimaginable. These technologies have provided powerful tools capable of facilitating transformation across various domains of life, creating vast opportunities to enhance human welfare and well-being.

Among the most influential of these technologies are smartphones, personal computers, laptops, and the Internet, which collectively constitute a global network for collecting, storing,

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DOI: https://doi.org/10.59543/ijsdg.v1i.16167

sharing, and retrieving information in digital form characterized by flexibility, accessibility, and efficiency. Social media platforms, as an extension of these technologies, enable users to upload, edit, and distribute diverse forms of digital content, such as audio recordings, images, and videos, thus transforming communication into an interactive and participatory process [19, 34]. The Technological Revolution has further enhanced the evolution of the World Wide Web, particularly through the emergence of Web 2.5 applications, which introduced interactive and participatory services that allowed users to engage collaboratively in the creation and exchange of content. As a result, social networking sites have evolved into virtual public spheres that attract citizens to exercise digital forms of civic participation and social engagement.

The seminal work of Marshall McLuhan notably The Mechanical Bride (1951) and The Gutenberg Galaxy (1962) anticipated that technological and informational revolutions would transform the world into a "global village," where geographical and political boundaries would no longer hinder human communication. However, McLuhan also recognized that this "village" would not be ethically ideal, a concern he elaborated upon in War and Peace in the Global Village (1969), where he warned of the potential dangers of technological dominance. Similarly, Alvin Toffler, in his renowned work Future Shock, emphasized the necessity of "taming technology" to prevent its harmful psychological and social consequences [35].

Despite the undeniable benefits of digital connectivity, the virtual public sphere has also become a breeding ground for cybercrimes and unethical digital practices, largely due to the erosion of social responsibility and moral self-discipline among users. Online dialogue and discussion have frequently degenerated into sectarian, regional, and extremist discourses characterized by hate speech, incitement, and moral degradation. In some cases, digital interactions have escalated into glorification of terrorism, deviant behaviors, and violations of ethical and legal norms, thereby threatening citizens' emotional security and the social and political stability of entire communities [35]. Empirical evidence also supports these ethical concerns. The study by Royakkers, Timmer, Kool, & van Est [38] confirmed that digitalization significantly impacts fundamental social values such as privacy, justice, and human dignity. The authors argue that protecting these values requires embedding ethical considerations into everyday digital practices across sectors, warning against the risks of technological dominance ungoverned by moral frameworks.

Among the most alarming manifestations of the unethical use of digital technology is the phenomenon of digital drugs, an emerging and highly controversial concept within cyberspace. This phenomenon blurs the boundary between the virtual and the real worlds by transforming psychoactive substances from their traditional physical, liquid, or gaseous forms into digital formats such as audio or frequency-based files. Each digital file functions as a virtual "dose," designed to induce altered states of consciousness similar to those produced by conventional narcotics. Empirical research suggests that the neurological effects of these digital doses may parallel those of real drugs, and in many cases, may even lead to cross-addiction, whereby users of digital drugs subsequently seek similar sensations through physical drug consumption.

Digital drug addiction poses multifaceted risks, affecting individuals psychologically, socially, economically, and legally, before extending its impact to families and communities. Scientific evidence indicates that digital drugs can cause memory impairment, neural convulsions, loss of consciousness, depression, and cognitive decline, often accompanied by severe neurological

dysfunctions [43]. Similarly, Morsi (2016) examined digital drug addiction among Arab youth and found that the primary consequences were health-related, followed by social, educational, personal, and psychological effects. These findings align with those of Etman [18], who investigated the risks associated with teenage girls' addiction to electronic drugs and identified key correlates, including limited family relations, mood instability, feelings of inferiority, loss of emotional control, aggression, weak concentration, and physical fatigue.

It has become evident that legal frameworks, often characterized by rigidity and slow adaptability, are no longer sufficient to address the complex and rapidly evolving nature of digital crime. Even with state-level surveillance and regulation, the sheer pace of technological advancement continues to outstrip legal control mechanisms. The persistent rise in cybercrime rates, even in technologically advanced nations, illustrates the limitations of traditional legal responses.

Consequently, there is an urgent need for a preventive and preemptive approach to digital crime, grounded in the principles of digital ethics. Ethics, as a self-regulatory framework of moral conduct, functions as an internalized mechanism that guides digital behavior and restrains individuals from harming others complementing legal systems much like cultural morality sustains law within societies. With the globalization of digital communication and the erosion of geographical, political, and cultural boundaries, professional codes of digital ethics have emerged across multiple disciplines.

Based on the preceding discussion, the current study raises the following central research question:

To what extent can digital ethics serve as a preventive mechanism against digital drug addiction?

To answer this question, the study employs the descriptive-analytical method, aiming to explore the dynamics of digital ethics as a moral safeguard and to highlight their potential role in mitigating the psychological and social consequences of digital addiction.

2. Significance of the Study

- The widespread expansion of digital technology and the Internet worldwide, as the number of users has reached approximately 6.5 billion people, representing 64.4% of the global population. This growing digital presence highlights the profound social and behavioral implications of technology use in contemporary societies.
- The critical importance of the demographic group targeted by digital drug dealers — youth, who represent the driving force of development and the future of nations. This makes them a particularly vulnerable and influential group in shaping the digital culture of tomorrow.
- The necessity of strengthening and institutionalizing digital ethics, along with raising awareness of its importance among users of digital technologies, as an essential component of responsible digital citizenship and social accountability.
- The urgent need to limit the spread of digital drugs and to raise awareness of their dangers, especially since these substances are often promoted and deceptively marketed as legal, beneficial, and harmless, thereby misleading individuals and increasing the risks of psychological and behavioral harm.

3. Study Objectives

The present study seeks to achieve the following main objective:
To identify the extent to which digital ethics contribute as a preventive mechanism against addiction to digital drugs. Analyze the impact of stigma on the self-concept of formerly incarcerated individuals.

4. Significance of the Study

On an academic level, this study contributes to deepening the sociological understanding of social stigma as a symbolic mechanism that reproduces the exclusion of formerly incarcerated individuals. It employs Goffman's theoretical framework to analyze the nuanced interactions between the "spoiled self" and social context, enriching literature on identity reconstruction and the symbolic dynamics of internalized shame.
On a societal level, the study focuses on the complex and interrelated structural challenges faced by individuals after release, clarifying the role of social actors in either reinforcing or undermining the stereotypes associated with them. From this standpoint, the study provides a framework for understanding the non-legal barriers that limit reintegration opportunities, potentially contributing to the formulation of more inclusive and humane policies toward this group.

5. Research Questions

The present study seeks to answer the following main research question:

To what extent do digital ethics contribute as a preventive mechanism against addiction to digital drugs?

6. Study Concepts

The study relies on several central concepts forming its theoretical framework:

- **Digital Ethics:** Digital ethics are defined as the set of rules and regulations that ensure the optimal and appropriate use of technology by its users [17].
  They are also defined as a system of standards and guiding principles for the design, implementation, and use of digital technologies, encompassing responsibility in professional practice, accuracy, accessibility, personal integrity and honesty, confidentiality of information, intellectual property rights, public health and safety, and overall well-being (van den Hoven, 2008, p. 49).
- **Digital Drugs:** it referred to in English as digital drugs and in French as les drogues numerous are MP3 audio files stored in a special playback format developed by a commercial website using open-source technologies (GPL – Open Source). They are marketed under the name digital drugs as audio tracks ranging from 30 to 40 minutes in length. These files can be downloaded and played through a special application designed for operating systems such as iOS and Android, allowing users to listen via smartphones, tablets, or personal computers. Digital drugs are engineered audio files designed to deceive the brain by emitting slightly different sound frequencies into each ear. Because these auditory frequencies are unfamiliar, the brain attempts to harmonize them to achieve auditory balance. This process converts the difference in frequencies into a perceptual sound gap, which in turn destabilizes the brain's electrical system.

The brain's electrical properties vary according to the type of frequency difference, leading to sensations that mimic the effects of certain natural narcotics [10].

7. Research Methodology

The researcher employed the descriptive-analytical method as the most suitable approach for exploring and interpreting phenomena related to digital drug addiction and digital ethical frameworks within the cyberspace environment. The descriptive aspect allows for a systematic and detailed account of digital behaviors ethical challenges and current preventive practices, providing a clear depiction of the present reality. Meanwhile, the analytical dimension examines the relationships between the components of digital ethical frameworks and their effectiveness in mitigating digital addiction by analyzing underlying causes, patterns, and impacts of unbalanced technology use. This combination of description and analysis enables the researcher to derive precise conclusions and offer evidence-based recommendations for enhancing the application of digital ethics as an effective preventive measure in cyberspace.

8. Section 1: Digital Ethics

8.1 Historical Overview

Since the earliest Eastern civilizations and ancient Greek philosophy, the study of ethics has been primarily a theoretical and philosophical discipline, concerned with formulating general moral principles and determining the nature of good and evil, or defining the ethical values that should guide human behavior/ More recently, the field has expanded to encompass "new media ethics," a modern and evolving branch that remains in a state of constant transformation due to the rapid pace of technological change [7]. Technology in all its forms and applications was originally developed to facilitate and enhance human life and promote social well-being. Yet, contemporary realities reveal that many individuals either ignore or misunderstand the fundamental purposes behind technological innovation and lack awareness of ethical digital conduct.

Numerous examples illustrate this misuse, including privacy violations, data espionage, identity theft, and intellectual property infringements. Unethical behaviors also include plagiarism and intellectual theft, software piracy, data corruption or destruction, cyber sabotage, and online defamation and harassment. These risks also stem from interpersonal interactions through chat platforms and the misuse of mobile phones, such as harassment, invasion of privacy, or sharing inappropriate photos and videos through smartphone cameras in unethical ways.

It is worth noting that unethical use of technology is not a recent phenomenon. The first recorded digital crime occurred in 1966, when a computer programmer deceived a bank by continuing to withdraw and cash checks despite having no balance. The fraud persisted until the bank's computer system malfunctioned, forcing a return to manual processing. At that time, no explicit laws existed to criminalize such behavior, and the act was merely classified as the input of false data into bank records [37].

8.2 Digital Technology Globally and in the Arab World

a. Digital Technology Worldwide

In contemporary society, children and adolescents increasingly interact with strangers through digital platforms, which exposes them to a range of potential risks. Controlling the use of technology within this digitally networked society has thus become a major challenge.

Recent studies and statistical reports indicate a steady and substantial rise in global Internet users. As of November 15, 2022, the world's population surpassed 8 billion, reaching 8.01 billion at the beginning of 2023. According to the report titled "Digital 2023: Global Overview" published by DataReportal, there has been a significant expansion in digital behaviors and Internet engagement worldwide over the past year. Moreover, more than 5.16 billion people are now connected to the Internet globally, representing 64.4% of the world's population. The total number of Internet users increased by 1.9% during the past year, and although reporting delays may have slightly affected this figure, the actual growth rate is likely higher. (Source: www.https://datareportal.com, 2023)

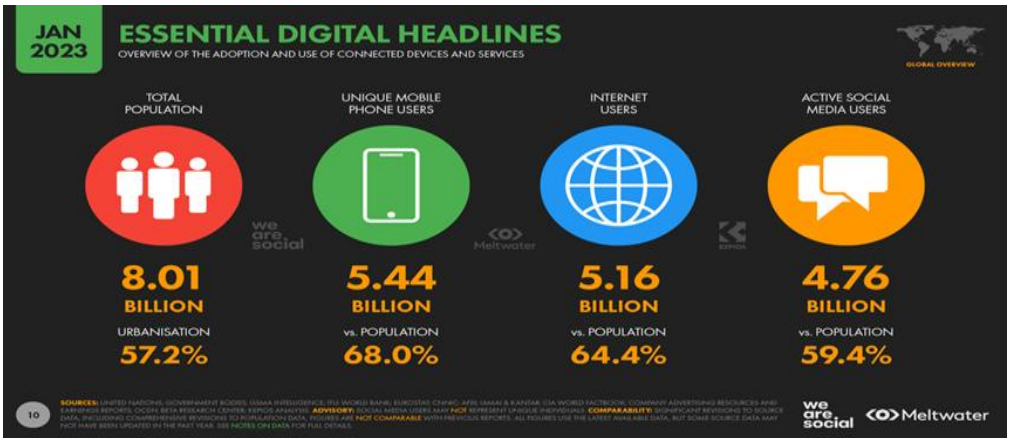

Fig. 1. illustrates the number of Internet and social media users worldwide in 2023.

Regarding the average monthly time spent on social media platforms, the statistics are as follows:

23 hours on YouTube, 19 hours on Facebook, 17 hours on WhatsApp, 12 hours on Instagram, 23 hours on TikTok, 3 hours on Messenger, 3 hours on Telegram, 5 hours on X (formerly Twitter), and 10 hours on Snapchat.

2. Digital Technology in the Arab World

steady and continuous rise in the use of digital technology, social media platforms, and smartphones. This increase became particularly significant during the COVID-19 pandemic, which accelerated digital adoption across all sectors, and the upward trend has continued even after the pandemic subsided.

According to the most recent global digital reports, Libya, for example, has a population of approximately 6 million people, with 12 million mobile connections, indicating that many individuals use more than one mobile device. The number of Internet users in Libya has reached 3 million, representing 45% of the population, while the number of social media users stands at 5 million.

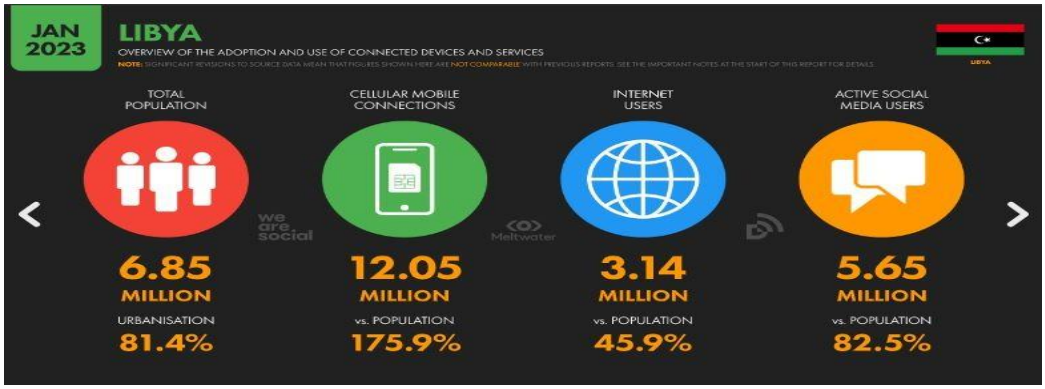

Fig. 2. illustrates the number of Internet and social media users in Libya in 2023.

In Egypt, the population has reached approximately 111 million people. Among them, around 105 million individuals use mobile phones, while 80 million are Internet users, representing 72% of the total population. Additionally, the number of social media users in Egypt has reached 46 million.

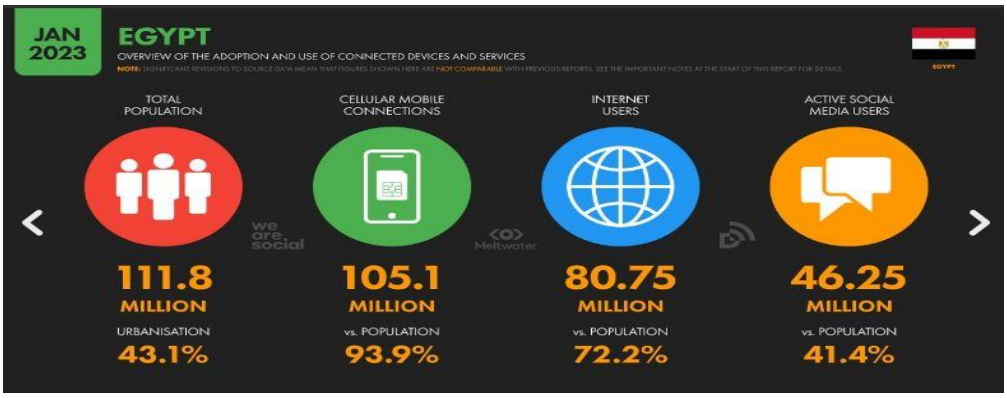

Fig. 3. illustrates the number of Internet and social media users in Egypt in 2023.

Other Arab countries also demonstrate significant engagement with digital technology, as illustrated in the following table:

Table 1

Number of Digital Technology Users in Arab Countries, Source: *https://datareportal.com*

No.	Country	Population	Social Media Users	Mobile Phone Users	Internet Users
1	Algeria	45 million	24 million	48 million	32 million (70%)
2	Iraq	45 million	25 million	45 million	33 million (74%)
3	Jordan	11 million	6 million	8 million	9 million (88%)
4	Kuwait	4 million	3 million	7 million	4 million (99%)
5	Lebanon	5 million	4 million	4 million	4 million (86%)
6	Morocco	37 million	21 million	50 million	33 million (88%)
7	Oman	4 million	4 million	6 million	4 million (96%)
8	Palestine	5 million	3 million	4 million	4 million (74%)
9	Qatar	5 million	2.6 million	4 million	2.6 million (99%)
10	Saudi Arabia	36 million	29 million	42 million	36 million (99%)
11	Sudan	47 million	N/A	32 million	13 million (28%)

12	Syria	22 million	N/A	15 million	8 million (35%)
13	Tunisia	12 million	7 million	16 million	9 million (80%)
14	United Arab Emirates	9 million	10 million	19 million	9 million (99%)
15	Yemen	34 million	3 million	19 million	9 million (26%)

8.3 The Importance of Digital Ethics

Digital ethics play a fundamental role in the age of digitization and artificial intelligence. Their significance is reflected in several aspects that contribute to both individual and societal development, as follows:

A. They help individuals achieve self-realization and develop their ability to grow, evolve, and flourish in terms of potential capabilities, interests, characteristics, skills, future vision, and life aspirations.

B. They provide opportunities to enhance and strengthen the capacities of individuals and society as a whole.

C. They contribute to problem-solving through a more sustainable approach to resource consumption, which in turn improves the quality of human life [22].

D. They enable institutions to benefit from the social value created by digital technologies through identifying and investing in new socially acceptable opportunities.

E. They assist in seizing opportunities and making the best possible use of them.

F. They help predict and prevent errors or reduce them, thereby protecting workflows from socially negative or unacceptable practices.

G. Digital ethics serve as an early warning system against potential risks that may threaten local and international institutions and organizations [21].

H. They help translate fundamental ethical principles such as human dignity, freedom, autonomy, and social justice into actionable guidelines applicable to the design and use of digital technologies [33].

I. Digital ethics contribute to digital governance and innovation by providing ethical evaluation of what is considered right or good, thereby shaping and directing digital development [20].

8.4 Sources of Digital Ethics

Ethics take several forms that can be manifested in the following sources:

A. Personal Ethics:

Each individual possesses a set of personal beliefs, principles, and values that they transfer to the organization in which they work or to the wider community. These values and beliefs are translated into ethical behaviors.

B. Administrative Organization:

Administrative organization influences ethics through various elements such as recruitment systems, employee training programs, and the formal organizational structure all of which contribute to shaping ethical conduct.

C. Government Laws, Regulations, and Legislation:

The law defines and establishes acceptable standards in the field of business, which in turn guide the behavior of workers and managers. The existence of such laws serves as a barrier against unethical or unacceptable behaviors.

D. Organizational Culture:

It represents a set of values, norms, traditions, and aspirations that form a framework governing the

behavior of employees at all levels. Organizations with strong and deep-rooted cultures possess firm values that act as a shared language among all members. The influence of such culture is clearly reflected in employees' behavior and decision-making processes. In some organizations, pride in their distinctive organizational culture reaches a level where it becomes a key reference and source of identity within the institution [2].

8.5 Principles of Digital Ethics

Digital ethics are grounded in a set of fundamental principles, which can be summarized as follows:

A. Autonomy:
Individuals possess intrinsic value and have the right to make decisions concerning their own lives, free from external interference.
B. Integrity:
It involves communicating the truth to individuals, as they have the right to be fully informed.
C. Loyalty:
This principle encompasses honesty, keeping promises, maintaining public trust, and striving for excellence in the quality of one's work.
D. Human Dignity:
The lives and inherent worth of all human beings must be respected and protected.
E. Justice:
All individuals should be treated equally and fairly, without any form of discrimination.
F. Humanity:
Our actions should be directed toward fair and meaningful practices that contribute positively to the well-being of society.
G. The Common Good:
Actions should be guided by the principle of achieving the greatest good for the greatest number of people. The UNESCO Global Ethics Observatory was established to assist nations in developing their capacities in the fields of applied ethics.

8.6 Ethical Constants Related to the Use of Digital Technology

A. Avoid using computers or digital systems to cause harm to others.
B. Avoid disseminating false or misleading information through digital platforms.
C. Avoid interfering with other users' activities on computer networks or deliberately creating obstacles that disrupt their work.
D. Refrain from using stolen or pirated software and applications.

8.7 The Role of Socialization Institutions in Shaping Digital Ethics

Moral education and digital awareness among digital citizens can be gradually acquired through the following institutions:

A. The Family:
Traditionally, the family has played a central role in shaping the moral and cultural values of individuals and preparing them socially and psychologically to face life's challenges. However, in recent years, this role has declined due to several factors such as women's participation in the

workforce, the rise of daycare institutions, and most notably the widespread use of modern information and communication technologies such as the Internet, smartphones, and electronic games. These technologies have captured the attention of individuals, particularly adolescents and youth, leading to a decline in family relationships in favor of virtual relationships through social media platforms. Such platforms have redefined family dynamics and now pose serious ethical risks to youth, as reflected in the proliferation of immoral content across these platforms.

B. Educational Institutions:
Integrating educational modules on digital literacy and technological ethics into school curricula is essential to equip students with technological awareness and digital vigilance when engaging with modern information and communication technologies. Such education fosters their ability to recognize potential risks and avoid unsafe or unethical online environments.

C. Media and Communication Outlets:
Mass media play a crucial role in encouraging citizens particularly those hesitant or fearful of modern technologies to embrace the digital transformation as an inevitable necessity. The power of media lies in its persuasive capacity: radio, television, and newspapers can effectively inform and warn the public about unethical digital behaviors that are punishable by law, such as online fraud, identity theft, extortion, defamation, and invasion of privacy. Therefore, media organizations must themselves adapt to the digital revolution and serve as professional models of ethical and responsible digital spaces that meet the expectations of the virtual public [35].

D. Religious Institutions (Mosques and Churches):
Places of worship such as mosques and churches play a vital role in shaping both moral and digital awareness, given that religious discourse enjoys the trust and respect of large segments of society. Religious leaders can thus contribute to fostering digital and technological vigilance by clarifying the Islamic and Christian ethical positions regarding the use of information and communication technologies. To achieve this, religious figures should receive regular training on modern technologies, particularly social media platforms, which attract massive audiences. This would allow them to reach and educate individuals who do not attend religious institutions, ensuring ethical and responsible digital engagement.

E. Laws and Legislation:
The modern digital environment requires states to adapt their legal and legislative frameworks to current technological realities. This adaptation enhances information security and protects citizens and institutions from cybercrimes while closing legal loopholes that might be exploited by domestic or international cybercriminals. Cybercriminals may range from amateur hackers to professional crackers, and the threat intensifies with transnational cybercrime, which is harder to trace and often involves organized criminal networks targeting governments and institutions to create internal crises. Social media platforms, in particular, play a role in accelerating crises and shaping public discourse by enabling the rapid exchange of information. This characteristic, though powerful, can also be exploited to exacerbate instability or fabricate crises. Therefore, digital citizens must exercise a high degree of caution and critical awareness when engaging with online content, especially that which originates from unverified sources [35].

8.8. Areas of Digital Ethics:

The fields of digital ethics are varied and diverse. Among the most important are the following:

A- Intellectual Property (Copyright Protection):

The importance of protecting intellectual property has significantly increased in the context of the rapid and continuous development of the digital age. This growing emphasis stems from the need to address the challenges arising from technological advancement, which require strengthening the mechanisms of intellectual property protection. Individuals must also develop greater awareness of this issue and apply appropriate practices to ensure effective safeguarding of intellectual property rights.

Intellectual property refers to the intangible ownership rights of individuals, including inventions, literary and artistic works, names, symbols, designs, musical compositions, paintings, sculptures, computer software and applications, sound recordings, trademarks, new plant varieties, and trade secrets [28].

It also refers to creations of the mind encompassing everything from literary and artistic works to inventions, computer programs, and trademarks.

(World Intellectual Property Organization

B- Privacy:

In the digital era characterized by advanced communication technologies, there is an increasing need to protect the confidentiality of personal information and prevent its unauthorized sharing. Meeting this challenge requires freedom from informational intrusion and respect for personal privacy to ensure safety, security, and trust within the digital environment.

Privacy is a right inherent to every individual, allowing each person to decide which personal information to disclose while requiring others to respect that right. However, this right has become increasingly threatened in the context of institutions that provide digital services, where accessing users' data without consent has become easier. Privacy can be protected through technical measures such as data encryption. A notable example of privacy violation was the case of "Gratis Internet," which sold the personal data of millions of users despite promising not to do so. This act resulted in a flood of unsolicited advertising emails and demonstrated the urgent need for stricter privacy protection laws and penalties for companies that violate user trust [8].

C- Accuracy:

The digital age is marked by the vast availability of data and the ease of publishing and sharing information. Therefore, it is crucial to ensure the accuracy of information before dissemination.

Accuracy means authenticity in the use of information, which requires exercising caution when exchanging or sharing data via digital platforms due to the widespread presence of misinformation and fake news. It is necessary to verify facts, correct mistakes, and take responsibility for any harm caused by inaccurate information [27].

D- Safety:

The use of digital technologies may expose individuals and societies to various threats; hence, promoting digital safety is a vital value to protect users from potential risks.

Digital safety refers to protection from technological threats that could lead to severe losses in society. Spam emails and computer viruses are among the most common violations of digital safety, as they can damage or disable entire systems [1].

Unauthorized access to the internet or the creation and distribution of harmful software are also examples of safety violations. Therefore, developers must always consider the ethical and practical consequences of any digital application they design or distribute to others [16].

8.9 Digital Ethics at the International Level

Digital ethics has emerged on the international scene as a result of the global nature of technology and the expanding influence of digital crime, which has transcended national borders. Nations now face similar ethical challenges arising from the misuse of the Internet and digital media. These challenges have created a strong motivation for international cooperation and collaboration among professional organizations to confront them by establishing shared ethical standards.

These common standards are designed to complement and reinforce national laws, aiming to promote ethical digital behavior and to protect universally recognized human rights, such as the rights to privacy, freedom of expression and media, and the protection of human dignity.

The United Nations attaches particular importance to ethics. It has established ethics committees within its various agencies and entrusted the International Telecommunication Union (ITU) with the task of formulating digital ethics. The numerous international forums organized by this agency have culminated in the issuance of global reference documents that regulate and promote ethical digital conduct. This began with the Geneva 2003, Tunis 2005 World Summit on the Information Society, which produced the "Declaration of Principles" entitled "Building the Information Society: A Global Challenge in the New Millennium." It continued through to the Virtual WSIS Forum 2020, which further developed discussions on global digital ethics.

In addition, several initiatives have emerged from international experts and regional organizations to formulate Internet codes of ethics, such as the African Declaration on Internet Rights and Freedoms, the Global Network Initiative on Internet Rights and Privacy (launched by a group of investors, corporations, and researchers), and the IFLA–UNESCO Statement on Ethics of Internet Use in Libraries, among others [32].

9. Section 2: Digital Drugs

9.1 Historical Overview

The use of music and sound effects in psychotherapy dates back historically to the ancient Egyptian physician Imhotep in 2850 B.C., who was the first to employ music as a therapeutic tool. He established the world's first medical institute dedicated to treatment through musical vibrations. Modern research has shown that musical vibrations directly affect the nervous system, where each frequency or combination of frequencies can influence a specific part of the brain connected to a particular nerve. This leads to a form of neural anesthesia that allows the individual to relax and focus on overcoming the sources of pain. Consequently, the body activates its natural antibodies and internal secretions, which assist the immune system and other bodily systems in combating pain [40].

The impact of sound waves on humans' dates back to very ancient times, as the human heartbeat itself is influenced by rhythmic patterns. This relationship manifests in humans' responses to external auditory stimuli. Such effects were observed in primitive cultural practices for instance, rain dances among Africans and Zar drumming rituals among Arabs which induced altered states of consciousness and emotional expression.

Digital drugs originated from a technique known as "binaural beats", discovered by the German scientist Heinrich Wilhelm Dove in 1835. This technique was first applied in 1970 for the treatment of certain psychological conditions, particularly among patients with mild depression who

refused behavioral therapy. The treatment used electromagnetic oscillations to stimulate the release of mood-enhancing neurotransmitters such as dopamine and beta-endorphins [13]. Research demonstrated improvements in learning ability, sleep cycles, pain reduction, and the induction of feelings of relaxation and recovery.

During the 1970s, this technique was used in American psychiatric and mental health hospitals to stimulate the brain to release hormones of happiness, relaxation, and psychological pleasure, such as oxytocin and dopamine. It is noteworthy that while injection-based depression treatments can cost thousands of dollars, sessions using this technique typically cost only 3 to 10 dollars per session, with no more than two sessions per week [11].

9.2 Mechanism of Digital Drugs

Digital drugs operate through a specific mechanism designed to produce effects similar to those of traditional narcotics and in some cases, may even lead to a state of addiction. This is achieved by inducing the brain into an illusory state, resulting in sensations of euphoria and altered consciousness.

Digital drugs consist primarily of audio files, sometimes accompanied by visual stimuli such as moving patterns or colors, which are carefully designed to deceive the brain. These audio files are engineered using sound waves of different frequencies transmitted separately to each ear.

Since the brain is unfamiliar with these asymmetric auditory frequencies, it attempts to synchronize the two frequencies to create a unified perception. This process produces electrical instability in the brain, leading the listener to perceive the presence of a third (illusory) tone, in addition to the two original sounds a phenomenon known as auditory illusion (binaural beats).

For example, if a listener receives a 325 Hz tone in the right ear and a 315 Hz tone in the left ear, the brain perceives an illusory third sound resulting from the difference between the two frequencies. This illusory tone triggers physiological effects, such as an increase in heart rate and a general sense of imbalance within the body.

Some researchers refer to this illusory third tone as an auditory deception, since when the listener alternates the source of the sound between the two ears, it becomes evident that there are no actual beats, but rather a perceptual illusion created by the brain [5].

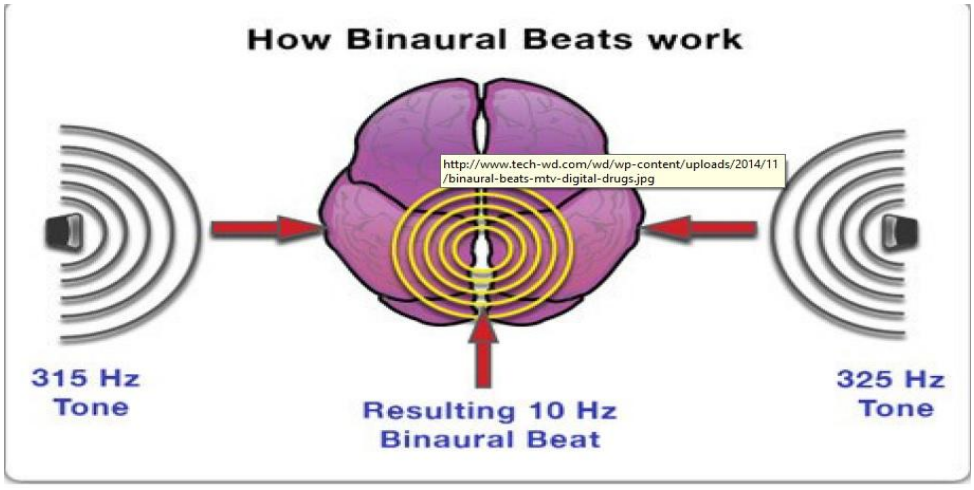

Fig. 5. illustrates the difference between sound vibrations on the ears and their effect on the brain [23]

The differences between the waves are divided into four categories according to their effects on the listener's brain, as follows:

- Delta (0.5–4 Hz): induces a state of deep sleep.
- Theta (4–8 Hz): induces a state of drowsiness or the onset of sleep.
- Alpha (8–14 Hz): induces a state of relaxation while maintaining alertness.
- Beta (14–30 Hz): induces a state of heightened alertness and intense concentration.

* Hertz (Hz) refers to the number of repetitions or cycles of a periodic phenomenon occurring in one second Sound travels in the form of longitudinal waves, which are oscillations in the pressure of the transmitting medium.

Humans perceive the frequency of sound waves according to the strength of these vibrations, and each musical note corresponds to a specific frequency of sound waves.

This frequency is measured in units of Hertz (Hz). (Source: https://ar.wikipedia.org/wiki)

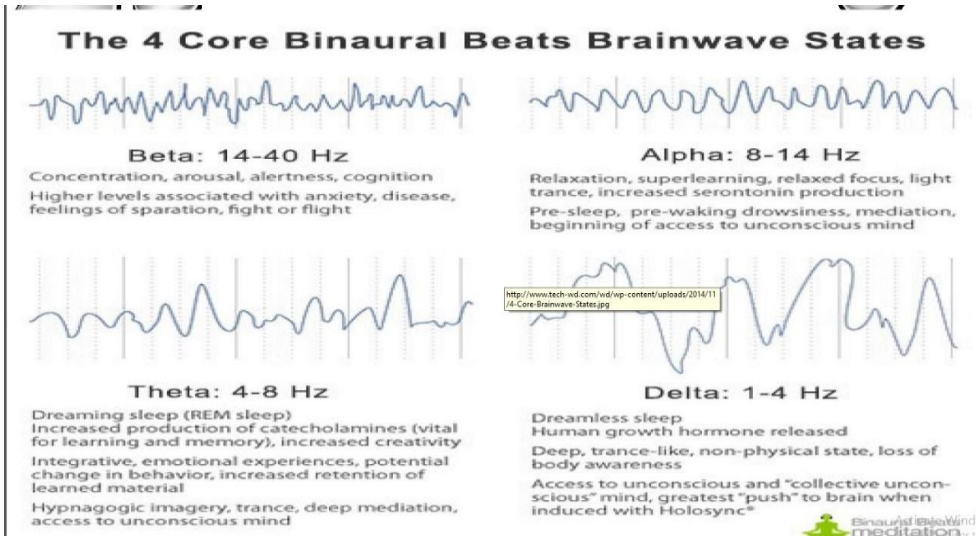

Fig. 6. An image illustrating the difference between brainwave patterns according to their effects on the brain [23]

For optimal alertness and activity states, it is recommended to listen to tones with frequencies of 130 Hz and 150 Hz. For achieving complete relaxation, listening to tones with frequencies of 140 Hz and 145 Hz is preferred.

Note: When individuals consume these tones through external speakers, the difference between the two frequencies disappears, and the brain processes them as a single frequency. Therefore, it is essential to listen to these tones exclusively through headphones to ensure proper distribution to each ear, allowing the frequency difference to be clearly perceived within the brain [23].

9.3 Types of Digital Drugs

A. Crystal Myth Category: This category consists of calming tones that induce relaxation, hallucinations, and tranquility, creating a sense of euphoria through the recall of painful memories. These motivational yet soothing tones stimulate daydreaming in individuals and generate feelings of joy.

B. High Wave Frequencies: This category comprises stimulating tones that activate all body and mind cells, significantly enhancing mental stimulation and remarkably increasing individual activity levels.
C. Alcohol-Like Waves: These waves aim to produce calming and relaxing effects similar to those experienced with alcohol consumption.
D. Opiate-Like Waves: These waves stimulate feelings of euphoria, happiness, and drowsiness in consumers, mimicking the actual effects of opiate drugs.
E. Cannabis-Like Waves: These waves function to calm body functions and provide consumers with sensations of tranquility and euphoria, similar to the effects of smoking cannabis and entering a state of bliss.
Most Dangerous Digital Drug Categories for Human Health:
F. Cocaine-Like Waves: These waves contain stimulating tones for the nervous system, producing effects similar to cocaine consumption, including increased energy, vitality, and activity.
G. Sexual Stimulation Waves: These waves provide consumers with sexual euphoria similar to the experience of sexual activity and reaching climax.
H. Recreational Waves: These waves create feelings of entertainment and happiness in consumers, as if they are experiencing comfort and pleasure.

9.4 Methods of Digital Drug Consumption

Digital drug consumption follows specific guidelines outlined in a 40-page PDF reference manual available for download from the internet. This manual contains detailed instructions regarding dosage consumption, with prices ranging from $3 to $30 in the market. While consumption rituals have varied and multiplied, the most frequently mentioned rituals among the majority who have written about, consumed, or promoted these drugs can be summarized as follows:
The consumer creates an ideal relaxation environment, such as sitting in a dimly lit and quiet place.
The consumer wears loose and comfortable clothing.

- The individual places an eye mask over their eyes and focuses on the musical piece for thirty minutes to enhance the drug effects, with this period potentially extended to forty-five minutes to intensify the effects on the consumer.
- The consumer locks their room door to ensure privacy.
- The consumer uses high-quality equipment such as stereo headphones (MP3).
- Ensuring that consumption sessions are not exposed to any external interventions or interruptions.

Fig. 7. Illustrates the appearance of a user during listening sessions.

9.5 Marketing and Distribution Mechanisms of Digital Drugs

With the widespread proliferation of the Internet, the emergence of social media, and the rise of new media channels that escape effective oversight, correction, or fact-checking, some individuals have exploited these platforms to commercially promote unregulated digital drugs. They often market these products using attractive, euphemistic labels such as “Live the Vibe,” “Fly in the Sky,” “Musical Bliss,” or “Migrating Birds” to facilitate social acceptance and to entice adolescents and thrill-seekers across age groups and social strata to try and buy them.

Promotion strategies on social media typically rely on persuading young people that these substances are harmless, for example by circulating fabricated testimonials of individuals who purportedly experienced improvements in their lives after use. These narratives are reinforced by offering the audio products at low prices, thereby increasing accessibility and attracting the target audience while obscuring the potential negative effects. (www.Janoubia.com)

Digital drugs are marketed through multiple websites that present them as safe and legitimate, arguing that there exists no law criminalizing the listening to musical tracks in any country. These sites distribute content across a range of platforms, from mobile applications to desktop programs for Windows and macOS, and across various music tracks.

If an existing catalogue of available “doses” does not satisfy a customer, some vendors even offer to design a customized dose for a fee reportedly around USD 100 promising to produce the specific subjective effect described by the buyer.

These marketing sites commonly employ several persuasive claims some containing kernels of truth to recruit and mislead potential users, including:

- The assertion that these products contain no chemical substances.
- Claims that they exert no physiological impact on the body.
- Statements that they have positive effects, such as inducing relaxation or, conversely, excessive motor activity and heightened stimulation.
- The argument that their products are not legally punishable and are authorized for use.

Fig. 8. illustrates the online marketing of digital drugs.

In the first image, indicated by the arrow, the website deliberately highlights that the products it offers are “legal”, giving the impression of legitimacy and safety.
On the other side, marked by the parentheses, the website classifies its product categories under labels such as “Anti-Depression,” “Anti-Anxiety,” and “Brain Enhancement.” This strategy represents a manipulative marketing technique designed to attract potential users and reassure them that the products are lawful and harmless, thereby normalizing their use and reducing psychological resistance toward trying them.

9.6 Websites and Platforms Promoting and Selling Digital Drugs

at discovering how to access musical tracks with narcotic effects, found that by typing the term Digital Drugs into the Google search engine, approximately 463,000,000 search results appeared. A random sample of websites using this term or including it in their content was selected, as follows:
1. Doser Website
https://i-doser.com
This website offers a number of free audio tracks with the aim of promoting other paid tracks. It also markets its content through various platforms, including:
Insta, YouTube, Google+, Facebook, Twitter, Blog, Forum, Skype, Get in touch Email, Deal Doses, Newsletter.

2. Digipill.com Website
Although I-Doser is considered the most globally famous platform in this type of trade, there is another European version called Digipill.com, meaning "Digital Pills," based in London. It also provides the same type of narcotic audio tracks.
3. Facebook
By searching the keyword digital drugs in the Facebook search bar, several page titles appeared, such as:
a. Digital Drugs Coalition Page
https://www.facebook.com/DigitalDrugs
The page description states:
“The Digital Drugs Coalition is an association of euphoria enthusiasts who believe that art and music represent the purest expressions of existence.”
The page lists various soundtracks broadcasted on digital drug platforms, including:

- Hard Move_152bpm
- Smash Saw_150bpm
- Slow Motions_152bpm
- Sky Walker_154bpm
- Surprise_152bpm

b. I-Doser Facebook Page
https://www.facebook.com/IDoserCom/
c. YouTube
The platform hosts numerous audio clips, some lasting up to an hour, claimed to be digital drugs. When entering the term digital drugs into the YouTube search bar, the results include many tracks with attention-grabbing titles such as “Digital Drugs to Open the Third Eye.”
d. SoundCloud
The website contains many audio tracks utilizing 9D sound technology and identified as digital drugs. By entering the term digital drugs, the search yielded the following:
Found 500+ tracks, 442 playlists, 167 people.

9.7 Reasons for Digital Drug Use and Addiction
The reasons for using and becoming addicted to digital drugs vary according to individual circumstances and environmental factors, and these variations appear clearly across different societies. Among the most prominent reasons are:

- The insistence of promotional websites that their products are free from harmful chemical substances.
- The easy online availability of digital drugs without cost, effort, or legal supervision, which has led to increased production, use, and trade.
- Lack of legal monitoring or criminalization of such websites and their activities.
- Political instability, wars, poverty, and hunger, which have contributed to higher crime rates, including digital drug use.
- Globalization of human rights and the perception of internet access as a universal right.
- Weak religious and moral awareness among users.
- Association with peers who engage in substance use.
- Boredom, excessive leisure time, and financial availability.
- Influence of foreign cultures and blind imitation.

- Family and social problems acting as driving factors.
- The ease of accessing websites that promote such practices.
- Youth resorting to these behaviors as a means of coping with fear, anxiety, despair, and depression [43].

9.8 International Statistics on the Spread of Digital Drugs

A research team from Australia and the United Kingdom conducted a global survey in 2012 on the use of digital drugs. The study included over 30,000 participants from 22 countries, and results showed that around 5% of respondents had used binaural beats at least once in the previous year. Among these, about one in ten used the beats purely for recreational purposes. Most of these users were in their late teens or early twenties and also used illicit substances such as MDMA or cannabis. The countries with the highest numbers of such users were the United States, Mexico, the United Kingdom, Brazil, and Poland.

According to Monica Barratt, a sociologist from RMIT University in Australia, it is important to understand this phenomenon more deeply, as the full understanding of binaural beats as a form of digital drugs still requires further scientific research.

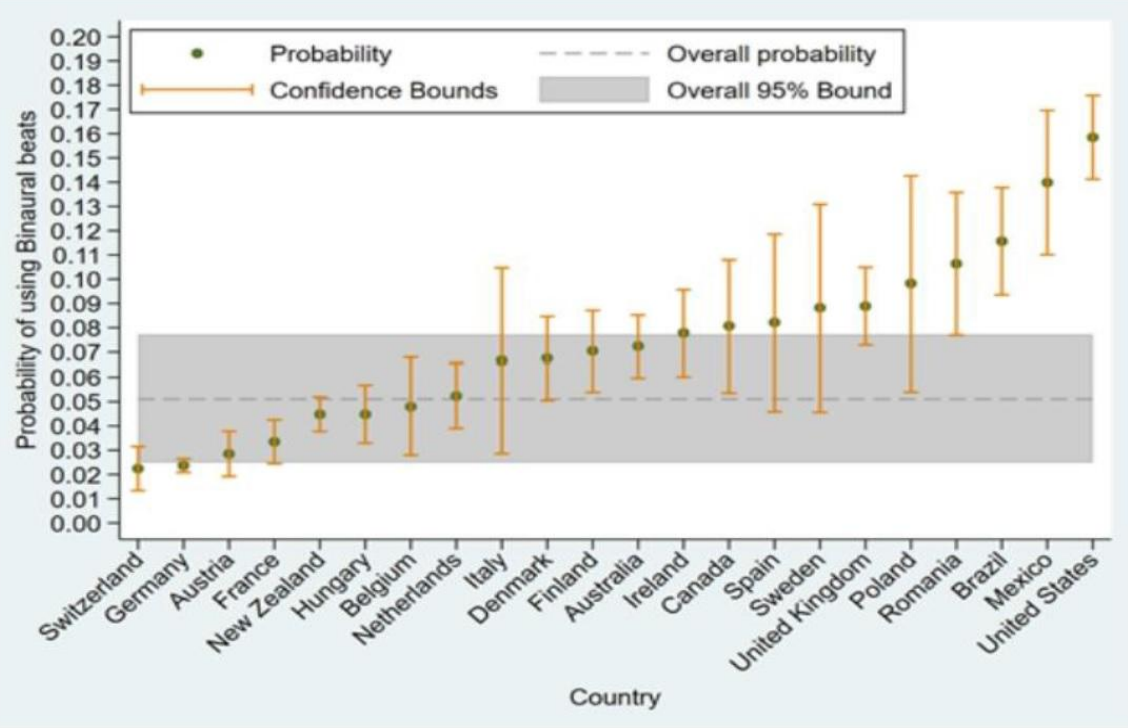

Fig. 9. The Probability Rate of Using Digital Drugs in Various Countries

9.9 The Effects of Digital Drug Use

Digital drug consumption produces numerous effects—psychological, social, and economic. Among the most notable are the following:

- Users may experience anxiety, depression, psychological disturbances, and mental confusion.
- It negatively affects the brain's electrical activity as a result of exposure to loud electronic music.
- Causes weak concentration and detachment from reality.
- Leads to convulsions resulting from repeated changes in the brain's electrical waves.
- Users exhibit symptoms similar to those caused by traditional drug use, such as tension, irritability, and psychological instability.
- Adversely impacts memory, reducing the ability to recall and retain information.
- Causes nervous and muscular spasms, body tremors, and repeated screaming.
- Users tend to live in isolation and suffer from fear and panic toward others, which may lead to life-threatening or socially harmful behaviors.
- Causes loss of consciousness, hallucinations, and loss of physical and mental balance, thereby increasing the likelihood of committing various crimes and threatening community safety.
- Leads to academic and professional failure, economic losses due to reduced productivity, wasted time, and loss of job opportunities, resulting in both public and private wealth depletion.

9.10 Digital Drugs in International Law

When discussing digital drugs, it becomes evident that no explicit legal provisions currently exist to criminalize them. This legal gap allows digital drug traders to exploit the situation by promoting their products online, asserting their legality on the basis that no law prohibits downloading audio files even if those files have narcotic effects.

Conventionally, drugs are defined as tangible substances. Digital drugs, however, consist of audio files, which are intangible. Thus, defining these sound files as "narcotic materials" raises a legal dilemma: how can non-physical entities be categorized as controlled substances? Traditional drugs can be listed in official schedules maintained by competent authorities, which can later expand to include other substances deemed narcotic.

Hence, the term digital drugs is legally inaccurate because such files do not fall within the classification of narcotic or psychotropic substances according to international definitions, which make no mention of this term.

9.11 Digital Drugs in Arab Laws and Legislations

Given that the phenomenon of digital drugs has not yet become widespread in Arab societies, the legal legitimacy of such activities has not been explicitly addressed in current legislation. There remains an absence of any law that criminalizes the listening to, production, or downloading of electronic sound files, even when these have effects similar to those of natural or synthetic drugs.

Additionally, the Electronic Signature Law was enacted to regulate the legal aspects of digital signatures and to define the criminal protections associated with related violations. This approach demonstrates Egypt's reliance on existing legislation to address cybercrimes in general [43].

The researcher believes that Arab legislators must establish explicit legal provisions criminalizing and prohibiting the sale and promotion of digital narcotic materials, imposing deterrent penalties on those who engage in such activities. This is especially urgent given that medical and psychological experts have confirmed the serious harm these substances cause to individuals' health particularly in our current era characterized by digitalization, artificial intelligence, and the widespread penetration of technology into every Arab household.

Just as technology has its drawbacks, it also offers potential solutions: legislators could collaborate with technology experts to block websites that sell or promote digital drugs, thereby safeguarding Arab youth from loss, addiction, and social collapse.

10. Section 3: Digital Ethics as a Preventive Mechanism Against Digital Drug Addiction

The Prince of Poets, Ahmed Shawqi, once said: "Indeed, nations are built on morals; if their morals are gone, they are gone."

The researcher believes that Shawqi's poetic analogy highlights the central role of ethics in the prosperity or downfall of societies. In today's digital age, traditional tools such as law and modern technological mechanisms are no longer sufficient by themselves to confront the increasing phenomenon of digital crime, particularly digital drugs. Hence, there has emerged an urgent need for digital ethics as an effective mechanism that complements the law in combating such crimes.

This is where the importance of digital ethics arises as a preventive mechanism against digital crimes, especially in the absence of clear legislative frameworks to address emerging digital issues.

Among the key concepts associated with digital ethics in preventing digital drug use is Digital Citizenship, which refers to the set of rules governing the interactions of digital natives when using technology, communication tools, and online services in a rational and conscious manner [26].

Traditionally, citizenship is built upon the sense of belonging to one's nation and the reciprocal relationship between the citizen and the state, encompassing both rights and duties. In the digital context, digital citizenship extends this relationship into cyberspace, where the digital citizen enjoys certain rights but must also adhere to digital laws and ethical standards. This entails adopting principles that guide online conduct, encourage responsibility, and prohibit actions that cause harm to others while exercising digital rights and freedoms.

Achieving effective digital citizenship requires activating and optimally utilizing digital rights and freedoms, especially in the context of preventing harmful phenomena such as digital drug use. Here emerges the role of digital education, which seeks to instill the values and principles of responsible digital citizenship. Digital education encompasses both ethical and behavioral dimensions, emphasizing digital conduct, responsibilities, and awareness, alongside technical competence in managing digital tools. In essence, digital education prepares individuals to be digitally literate citizens capable of using technology responsibly, lawfully, and ethically.

Scholars generally agree that adherence to digital ethics is deeply linked to the promotion of digital literacy and awareness among citizens. Such education helps prevent individuals from drifting toward criminal or harmful behaviors. Regulations and usage policies alone are insufficient to achieve this; rather, it is essential to orient educational and cultural initiatives toward fostering responsible digital citizenship within modern digital societies (previous reference, 2016, p. 22).

The researcher concludes that reinforcing digital ethics, digital education, and their underlying principles among Arab youth and adolescents is crucial in combating the spread of digital drug trade. Those who engage in promoting or selling such digital substances often act out of reckless ignorance regarding digital ethical standards and the destructive impact of their actions on individuals and societies. Therefore, instilling these values among young users of digital technologies in the Arab world can play a vital role in preventing digital drug abuse and reducing its promotion, sale, and consumption, driven by a sense of social responsibility toward their communities.

11. Conclusion

This study sought to explore the extent to which digital ethics can serve as a preventive mechanism against digital drug addiction. Digital ethics constitute the set of rules and principles governing users' behavior in digital environments particularly in the era of artificial intelligence and digital transformation, where technology dominates all aspects of life.

The widespread expansion of digital technologies has been accompanied by a rapid rise in cybercrimes, notably the promotion and sale of digital drugs to Arab youth across online platforms. This has prompted the researcher to demonstrate the pivotal role of digital ethics as a complementary tool alongside the law in curbing this phenomenon. Digital ethics bridge the legislative gap that exists in both global and Arab legal systems.

11.1 Key Findings

- The study achieved its main objective by identifying the contribution of digital ethics as a preventive mechanism against digital drug addiction. This was evidenced through the demonstrated importance of digital ethics in instilling responsibility and social awareness among Arab youth, thereby reducing engagement with digital drugs.
- The study answered its central question: To what extent do digital ethics contribute as a preventive mechanism against digital drug addiction? The findings confirmed that digital ethics act as a powerful support to legal frameworks, compensating for the absence of explicit legal provisions criminalizing digital drug activities.
- The research established the vital role of digital ethics in curbing digital drug abuse.
- It highlighted the serious psychological, social, and economic consequences of digital drug consumption, which impairs individuals' productivity and threatens the stability of societies.
- The study confirmed that, despite the danger of digital drugs, Arab legal systems currently lack explicit provisions criminalizing their use or distribution.

11.2 Recommandations

- Issuance of a unified Arab Ethical Charter on Digital Ethics through the League of Arab States, making it legally binding for all member countries.
- Organization of awareness seminars and educational campaigns on digital ethics for youth in schools, universities, and community centers, as well as across social media platforms.
- Promotion of academic conferences and research on digital ethics, encouraging continuous study and adaptation to evolving digital transformations.
- Integration of courses on Digital Ethics, Digital Citizenship, and Digital Education into school and university curricula to cultivate ethical digital behavior and respect for privacy and rights.
- Enactment of Arab legislation explicitly criminalizing the use, promotion, and sale of digital drugs through the Arab Parliament, which unites the legislative bodies of Arab states.
- Establishment of Digital Drug Monitoring Units within Arab Ministries of Interior, in cooperation with Ministries of Communication and Information Technology, tasked with tracking, detecting, and prosecuting digital drug dealers.
- Activation of cultural and educational initiatives via social media platforms to engage youth, identify their interests, and guide them positively.
- Blocking and shutting down websites promoting digital drugs, in coordination with cybercrime units, and establishing a hotline for public reporting of such sites.

- Launching nationwide awareness campaigns in cooperation with Ministries of Information and Religious Endowments to prevent youth from falling into the trap of digital drugs.
- Issuance of a formal statement by Al-Azhar and the Council of Senior Scholars declaring the prohibition of digital drugs, given their moral authority and influence among citizens.

Author Contribution

Conceptualization, methodology, data collection, writing—original draft preparation, writing—review and editing, and supervision were all carried out by Mohamed Elsayed Suleiman Ahmed. The author has read and approved the final version of the manuscript.

Funding

This research was not funded by any grant.

Conflicts of Interest

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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