

The very design of social media platforms further shapes and distorts how we communicate. Algorithms are engineered to promote content that generates high engagement, which often means highlighting emotional, extreme, or sensational material. This creates «echo chambers» where users are primarily exposed to opinions that mirror their own, limiting healthy debate and critical thinking. The rapid pace of these platforms encourages immediate, emotional reactions over thoughtful consideration, allowing misinformation to spread faster than fact-checking efforts can contain it.

Psychologically, social media has altered fundamental communication patterns, training users to expect immediate validation. The reward system of likes, comments, and shares prioritizes quick responses over thoughtful discourse and encourages a state of constant performance. The pressure to document and share experiences can undermine their authenticity, as the goal of capturing a perfect photo or crafting a clever caption overshadows the experience itself. Communication becomes less about genuine understanding and more about the careful management of one's public image.

In conclusion, the impact of social media on modern communication is complex and multifaceted. It has created unparalleled opportunities for maintaining relationships across great distances and building a sense of global community. Yet, it has also introduced new social pressures, made interactions more superficial, and created conditions where misinformation and division can thrive. Navigating this new reality requires a conscious effort to balance online and offline life, seek out substantive conversations, and remember that the curated world on our screens can never fully replace the authentic, imperfect, but genuine experience of human connection. Our society's ability to harness the connective power of these tools while mitigating their divisive effects will be crucial for the future of social interaction.

**U. Oreshkevich**

**У. Д. Орешкевич**

БГТУ (Минск)

*Научный руководитель А. В. Коньшева*

## **DIGITAL IMMUNITY: HOW TO BUILD A SUSTAINABLE SOCIETY IN THE FACE OF CYBERATTACKS, MISINFORMATION AND TECHNOLOGICAL FAILURES**

**Цифровой иммунитет: как строить устойчивое общество в условиях кибератак,  
дезинформации и технологических сбоев**

The sustainability of modern society is predicated on the reliable functioning of complex, interdependent systems – energy grids, financial networks, healthcare, and supply chains. These systems are now critically dependent on digital infrastructure, creating a landscape of novel vulnerabilities. The threats are no longer isolated; they are synergistic and systemic.

**Cyberattacks** have evolved from individual data breaches to sophisticated campaigns capable of disrupting national infrastructure, as exemplified by the Colonial Pipeline ransomware attack.

**Misinformation and disinformation** act as cognitive pathogens, eroding public trust, distorting democratic processes, and impeding collective action on critical issues such as public health and climate change.

**Technological Failures**, whether from software bugs, design flaws, or unforeseen edge cases, can trigger catastrophic cascades, as seen in the 2010 Flash Crash or the Boeing 737 MAX incidents.

These are not independent phenomena. A cyberattack can be leveraged to plant misinformation; misinformation can be used to socially engineer a cyber-breach; and a technological failure can be amplified by malicious actors to sow discord. Our current approach – building higher «cyber walls» or deploying fact-checkers post-hoc – is analogous to treating symptoms without addressing the underlying pathophysiology of a diseased system. We require a paradigm shift towards a proactive, integrated, and inherently resilient model.

One of the most tangible impacts of cyber threats is financial loss. According to a report by the Center for Strategic and International Studies, the global economy loses approximately \$600 billion every year due to cybercrime. A fortified digitally immune system can effectively counter such threats, significantly reducing the potential monetary loss that could result from data breaches, ransomware attacks, or service disruptions. It acts as a shield, safeguarding businesses and individuals from the direct and indirect costs associated with cybercrime.

Protection of sensitive data is another crucial role that digitally immune systems play. We live in an age where data is often equated with gold. Personal data, corporate secrets, intellectual property, financial information – all this information, if fallen into the wrong hands, can be used maliciously, causing irreparable damage. Digitally immune systems employ advanced encryption technologies and stringent access controls to protect this data, making it unintelligible and inaccessible to unauthorized entities

Building Digital Immunity is a grand challenge that demands a concerted, interdisciplinary effort. Key research vectors have to include some points. First of all, **computer science & engineering**: Advancing post-quantum cryptography, developing more robust formal verification tools, and creating self-healing, autonomous network systems. Secondly **complexity science & network theory**: Modeling the cascade effects of failures and attacks across socio-technical systems to identify critical leverage points for resilience. Thirdly **cognitive psychology & social science**: Quantifying the impact of misinformation and developing evidence-based interventions to «inoculate» populations through pre-bunking techniques. Fourthly **economics & policy Science**: Designing incentives for private sector investment in security, and creating international treaties and norms for state behavior in cyberspace.

The pursuit of sustainability can no longer be confined to the realms of resource management. The digital layer upon which our society operates is now a primary

determinant of its stability and longevity. The Digital Immunity framework provides a holistic, bio-inspired model for constructing a society that does not merely resist digital threats, but learns from them, adapts, and grows stronger. It is a call to action for the scientific community to transcend disciplinary silos and collaborate on building not just smarter systems, but a wiser, more resilient world. Our future sustainability depends not on achieving a state of perfect security, but on cultivating a capacity for perpetual resilience.

**A. Pavlovich**

**А. В. Павлович**

БГЭУ (Минск)

*Научный руководитель Е. В. Климух*

## **ONLINE WITHOUT PAUSE: NEW FORMS OF DIGITAL DEPENDENCY**

### **В сети без паузы: новые формы цифровой зависимости**

Advanced technologies replete our world with new features and capabilities. Meanwhile, the evolution of the technology world brings humanity not only benefits but drawbacks. The main problem of digital powers its influence on human psychological health.

The purpose of this study is to figure out how social networks new shapes of addictions, how they effect on people's health and ways to prevent internet involvement.

At first sight the internet is safe and fruitful space, but it is a thoughtful algorithm. Every like, comment or message provides dopamine release – hormone of enjoy. Social media analyze users' preferences and gives them content according to suggestions. Thus, individuals move into a steady stream of preferred data. Endless news feeds create the effect of filling without being able to stop.

All these features produce «trap» for adopters. Digital addiction is a form of psychological dependence in which a person experiences an overwhelming need to constantly interact with digital devices and the online environment, even at the expense of their health, responsibilities and actual communication.

Nowadays forms of technological addictions are:

1. Fear of missing out: permanent scrolling has formed a scare to skip something essential, exiting or favorable. Likes, comments, reposts ignorantly create a reward system.

2. Achievement addiction: player is stuck in the cycle «achieved goal -> short-term joy -> new, more difficult goal». Persistent gamers have become addicted to level complete and new challenges.

3. Nomophobia: fear of not having a phone and access to the online world. Phone is a universal source of dopamine doze. Therefore, without satisfaction gaps users feel uncontrolled anxiety.