

SOI: [1.1/TAS](#) DOI: [10.15863/TAS](#)

International Scientific Journal
Theoretical & Applied Science

p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online)

Year: 2024 Issue: 11 Volume: 139

Published: 08.11.2024 <http://T-Science.org>

Issue

Article



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PROTECTION OF PRIVACY AND DATA ON THE INTERNET

Abstract: This article addresses the pressing issues of protecting personal information in today's digital landscape. It highlights cyber threats associated with the use of artificial intelligence (AI) and the Internet of Things (IoT), as well as behavioral factors that contribute to data breaches. The importance of increasing user awareness and implementing multi-layered protection strategies, including data encryption and multi-factor authentication, is emphasized. The article also examines the consequences of cyberattacks and the role of legislation in data protection.

Key words: cybersecurity, data protection, behavioral factors, information leaks, encryption.

Language: English

Citation: Israfilov, A., & Yakovishin, A. (2024). Protection of privacy and data on the internet. *ISJ Theoretical & Applied Science*, 11 (139), 42-46.

Soi: <http://s-o-i.org/1.1/TAS-11-139-10>

Doi: <https://dx.doi.org/10.15863/TAS.2024.11.139.10>

Scopus ASCC: 1705.

Introduction

The importance of privacy and data protection is growing in today's fast-developing tech world. The increase in cyber-attacks taking advantage of vulnerabilities in personal information is due to the extensive use of social media, mobile apps, and online platforms. Artificial intelligence (AI) and machine learning (ML) technologies offer opportunities to enhance service quality, but they also bring about considerable threats to the security of user information. This situation only exacerbates the problem. Numerous individuals are not aware of potential dangers and lack knowledge on safeguarding their information.

This study aims to pinpoint the primary risks and provide suggestions for enhancing user consciousness in the realm of information security. It also evaluates the influence of technical and behavioral factors on personal data security and examines existing methods of protection.

Main part. Analysis of technological threats

The introduction of **AI and ML** is revolutionizing information processing. These technologies not only enhance business efficiency but also pose significant risks to the security of personal data. Nevertheless, users and organizations continue to prefer antivirus and security solutions based on these technologies (fig. 1).

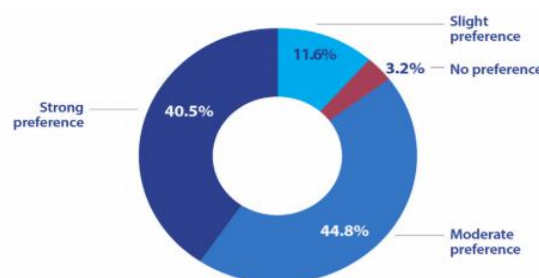


Figure 1. The number of users who prefer AI-based antivirus software, according to recent studies [1].

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Technologies like AI and ML are used to analyze user behavior and develop complex algorithms that predict it. However, this predictive capability can be exploited not only to improve the user experience, but also to manipulate users. For example, algorithms can adjust ad campaigns to influence user decisions rather than simply provide information. Such an approach raises questions about the possibility of controlling privacy and personal information.

Technological threats also include malware and phishing. **Malicious software**, also known as **malware**, takes user data, encrypts files, or requests a ransom for access to information. In contrast, **phishing** employs tactics of social engineering to trick individuals and obtain data like passwords and credit card details. Examples of phishing include fake emails and websites that mimic legitimate services to collect personal information [2].

Furthermore, **the Internet of Things (IoT)** presents another security vulnerability. Smart speakers, fitness trackers, and smart home systems often lack robust security measures. For example, hackers exploited vulnerabilities in IoT devices to create botnets used for DDoS attacks on the Mirai network [3]. This incident demonstrated that inadequate protection of devices can lead to large-scale incidents affecting millions of users.

Examining past cyberattacks can help better understand how perpetrators act and what the consequences are. Another important case is the data breach from Facebook, where information about some 87 million users was used without their consent for political purposes [4]. This event triggered an international discussion on data privacy and resulted in more stringent laws on safeguarding personal information, such as the implementation of the General Data Protection Regulation (GDPR) in the European Union.

By studying these incidents, common vulnerabilities that could be exploited by attackers can be identified. For example, lack of basic data protection or lack of regular system monitoring can lead to successful attacks. By learning from their mistakes, companies can strengthen their security systems and minimize risk.

It is important to remember that cyber threats can come from both internal and external sources. Internal threats, such as unhappy staff or accidental incidents, can also result in data breaches. It is clear that companies must establish a secure culture and offer consistent training to safeguard their own and their customers' data.

In order to protect against these technological risks, companies and users should implement multi-layered security measures. Data encryption, multi-factor authentication (MFA), frequent software updates, and specialized antivirus programs are effective strategies to use. Nevertheless, even though protective technologies are accessible, a lot of users

don't acknowledge their importance and don't use them correctly.

Behavioral aspects of users

Understanding cybersecurity risks is greatly influenced by behavioral factors. The habits and user interactions with information have been altered by the digital age, resulting in higher vulnerabilities. One of the most significant developments has been the increase in the use of social media, leading to heightened risks to personal data. Users frequently disclose personal information, such as their whereabouts, contact information, and financial details, without realizing that this data could be exploited to their detriment.

Research shows [5] that social media users do not change their account privacy settings, leaving their data open to anyone. This creates a conducive environment for phishing and other types of fraud, where attackers use collected information for manipulation. Users are unaware that their open profiles can be used to create fake pages or access their personal information.

Information illiteracy among users is also a significant issue. Many individuals lack the necessary knowledge to protect their data online. Users cannot correctly identify phishing emails and the risks associated with opening suspicious links. This leads them to open emails from attackers, which can compromise their data.

Additionally, **user behavior online may also relate to psychological aspects**. Many people tend to underestimate risks on the internet. This may stem from a sense of anonymity online or disbelief in the possibility of negative consequences from their actions. Users often do not consider that their actions can lead to data leaks or fraud. Psychological factors, such as optimism and trustfulness, may prompt to neglect security measures, significantly increasing their vulnerability.

The tendency to share information can also be influenced by social and cultural aspects. Individuals who were raised during the era of social media may view disclosing personal details as common practice. They might not be aware of the fact that it can result in serious outcomes. Younger generations may not fully grasp the potential dangers of making personal information public, leading them to share without careful thought. This highlights the significance of educational initiatives that focus on instructing youth in the fundamentals of cybersecurity.

The data shows [6] that many people use the same or simple passwords for different accounts, which significantly increases the likelihood of successful hacking. This habit may stem from a lack of time, unwillingness to remember multiple complex passwords, or underestimating the risks associated with using simple passwords. Furthermore, MFA is an important step in protecting accounts, yet its use among users remains low.

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Another important aspect is that users do not always understand the importance of privacy and data security. Many believe that companies and platforms automatically ensure their data protection, which is not always the case. Consumer trust in brands also plays a role: if users believe that a company cares about their security, they may be less cautious about their data. This can lead users to fail to check how their data is used and remain uninformed about potential risks.

Therefore, the behavior of users is essential in determining the risk level linked to cybersecurity. Comprehending these factors can aid in creating better

data protection tactics focused on altering user behavior and enhancing their understanding of the dangers they encounter online.

Methods of protecting privacy and data online

Considering the outlined risks, it is essential to explore available methods for protecting users' privacy and data. The first step toward ensuring security is awareness of potential threats and methods to mitigate them. CyberEdge Group conducted a survey [1] regarding how concerned users and organizations are about various cyber threats, rating their concerns from 1 to 5 (fig.2).



Figure 2. Relative concern for cyberthreats by type [1].

Users and organizations should actively participate in protecting their data, being aware of the risks associated with their online behavior. One of the most effective methods of protection is **data encryption**. Encryption transforms data into a format that is inaccessible to attackers, rendering it useless in the event of a breach. Many messaging services and email providers offer built-in encryption, enhancing the security of communications [7]. However, users must be cautious and choose platforms that genuinely provide a high level of protection.

Another important protective measure is the use of **MFA**. This approach requires users to undergo multiple verification steps before accessing their accounts, significantly increasing security. For example, in addition to a password, a code may be required, which is sent to the user's mobile phone or confirmed via an authentication app. This prevents unauthorized access, even if an attacker knows the password.

Additionally, users should **regularly update their devices and software**. Many updates include security patches that address vulnerabilities discovered in the software. Failing to apply updates can leave devices exposed to known threats.

Equally important is the use of antivirus software and firewalls. These tools can help detect and block potential threats before they can harm the device or steal data. For instance, antivirus programs can identify and eliminate malware, while firewalls monitor incoming and outgoing connections, reducing the risk of hacking.

Overall, there are numerous methods for effectively protecting personal data and ensuring online security. Each method has its own advantages and disadvantages, making it essential to choose the appropriate solution based on the specific situation (table 1).

Table 1. Various data protection methods, along with their advantages and disadvantages [8].

Data protection method	Advantages	Disadvantages
Multi-factor authentication	Increases security level by using multiple factors. Reduces the risk of unauthorized access.	Can be inconvenient for users. Requires extra time for login.
Antivirus software	Protects against malware and viruses. Provides regular updates to protect against new viruses.	May not always detect new threats. Requires constant updates and can consume system resources.

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User training	Increases awareness of cyber threats and ways to prevent them. Reduces the likelihood of errors related to human factors.	Requires time and resources for training sessions. The effect may be short-term without regular knowledge updates.
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Education and training for users in the field of cybersecurity play a crucial role in data protection. Recommendations for increasing user awareness should include training in recognizing phishing attacks, proper use of social media, and methods for protecting personal data. It's also important to create training programs for employees in organizations, as internal threats often prove to be more significant than external ones.

Companies should also implement strategies for data security, including training and regular cybersecurity drills. Effective methodologies, such as phishing attack simulations, help employees develop skills to recognize real-time threats.

Legislation related to data protection also plays an important role in setting security standards. Measures introduced, such as the CCPA (California Consumer Privacy Act), ensure users' rights to protect their personal data. The CCPA requires companies to be transparent about how they process data and gives users the right to request information about what data is stored about them, as well as the right to delete their data.

Such laws contribute to creating a safer environment for users. However, they also pose new challenges for companies. Many organizations are forced to revisit their data processing policies and procedures to comply with legal requirements. This

includes not only changes in data processing but also the need to implement security technologies, such as encryption and data anonymization.

Conclusion

Technological and behavioral risk factors for personal data on the internet present a complex interconnected issue. Protecting personal information requires a comprehensive approach that includes both the use of modern technologies and increased user awareness. It is important for users to understand what data they post online and to take active measures to protect it. Education and training in cybersecurity should become an integral part of both individual and corporate practices.

As technology evolves, so do the tactics of cybercriminals, requiring continuous updates in both technical defenses and user education. Additionally, the role of legal frameworks like the CCPA and other international data protection regulations will continue to grow, demanding that companies not only comply with these standards but also adopt proactive measures to anticipate future requirements. By fostering a culture of awareness and resilience, both organizations and individuals can better navigate the complexities of data protection, thereby contributing to a safer and more secure digital environment.

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