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An Analytical Study of Human Factors in Cyber Security Threat Mitigation

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1. Abstract:

Cybersecurity threats are increasing rapidly, but technology alone cannot ensure complete protection. Human behaviour plays a major role in preventing or causing security breaches. This study aims to analyze the human factors that influence cybersecurity threat mitigation. Data were collected through a structured Google Form survey focusing on users' awareness, attitudes, and practices related to cybersecurity. The collected responses were analyzed using descriptive and statistical methods to identify common behavioural patterns and weaknesses. The results indicate that lack of awareness, negligence, and poor password management are the key factors contributing to security risks. The study highlights the importance of continuous cybersecurity training, awareness programs, and user-friendly security policies to strengthen overall threat mitigation efforts.

Keywords - **Cybersecurity Awareness, Human Factors, Threat Mitigation, User Behaviour, Information Security**

2. Introduction

In today's digital world, the use of computers, the internet, and online services has become a part of daily life. Along with these benefits, the number of cyber threats and attacks is also increasing. Many times, these attacks happen not because of weak technology but because of human mistakes. People often use weak passwords, share personal information carelessly, or fall for online scams. These human actions make systems and data more vulnerable to cyber threats.

Technology such as antivirus software, firewalls, and security systems can help to protect information, but they cannot stop all attacks if users are not careful. Human awareness and behaviour play an important role in keeping information safe. Therefore, it is important to study how people understand and follow cybersecurity practices in their daily life.

Technology such as antivirus software, firewalls, and security systems can help to protect information, but they cannot stop all attacks if users are not careful. Human awareness and behaviour play an important role in keeping information safe. Therefore, it is important to study how people understand and follow cybersecurity practices in their daily life.

A. Statement of the Problem

In today's digital world, cybersecurity has become a major concern for individuals and organizations. Even with strong security systems in place, many cyber incidents still occur due to human mistakes rather than technical failures.

Often ignore security warnings, use weak passwords, share sensitive information carelessly, or fall for phishing and social engineering attacks. These behaviours create serious security risks and make it easier for attackers to bypass even the most advanced protection systems.

With the growing use of online platforms, remote work, and digital communication, it has become even more important to understand how people's knowledge, attitude, and behavior impact cybersecurity. However, limited research has been done to analyze these human factors in depth, especially in real-world settings.

Therefore, this study aims to examine the human factors that influence cybersecurity threat mitigation. By collecting data through a Google Form survey, this research will analyze users' awareness levels, common security practices, and behavioral patterns. The findings are expected to help identify key weaknesses and suggest practical measures to improve user awareness and reduce human-related security risks.

Therefore, this study aims to conduct an analytical investigation into the human factors that affect cybersecurity threat mitigation. Data will be collected using a structured Google Form survey to assess people's knowledge, habits, and awareness regarding cybersecurity. The purpose is to identify common weaknesses in human behaviour, understand their causes, and suggest practical ways—such as training, awareness campaigns, and behavioral changes—to reduce risks and strengthen overall cybersecurity resilience.

B. Objectives of the Research

1. To study the role of human behaviour, awareness, and attitude in cybersecurity threat prevention and mitigation.
2. To identify the common human errors and practices that lead to security breaches such as weak passwords, careless data sharing, and falling for phishing or social engineering attacks.
3. To collect and analyze data through a Google Form survey to understand the level of cybersecurity awareness among different groups of users.
4. To examine the relationship between users' knowledge, habits, and their ability to recognize and respond to cyber threats effectively.
5. To identify the key areas where lack of awareness or negligence increases vulnerability to cyber attacks.
6. To suggest practical ways to improve cybersecurity awareness through training, educational programs, and better communication of security policies.
7. To provide recommendations for developing user-friendly cybersecurity guidelines that encourage safe online behaviour and reduce human-related risks.
8. To contribute to a better understanding of the human side of cybersecurity and support organizations in building a stronger, awareness-based security culture.

C. Significance of the Study

This study is important because it helps to understand how human behavior and awareness affect cybersecurity. Even with advanced security technologies, many cyberattacks succeed due to human mistakes such as weak passwords, careless sharing of information, or falling for online scams. By studying these human factors, this research provides useful insights into how people can become the strongest part of cybersecurity rather than the weakest link.

The findings of this research study will help individuals become more aware of safe online practices and the importance of personal responsibility in protecting data. For organizations, the research can be useful in designing training programs and awareness campaigns that focus on improving employees' security behaviour.

This study also benefits educators, cybersecurity trainers, and researchers by providing data and analysis about how people understand and react to cyber threats. It encourages the inclusion of cybersecurity education in schools, colleges, and workplaces. Overall, the study contributes to building a more secure digital environment by promoting awareness, responsibility, and

3. Related Work

This section reviews previous studies related to human factors in cybersecurity, focusing on user awareness, behaviour, and the role of education and training in

A. Human Factors in Cybersecurity

Earlier research has shown that human behavior is one of the most critical elements in maintaining cybersecurity. While technical tools such as firewalls, antivirus software, and encryption are important, they cannot fully protect systems if users are careless or unaware of risks.

Many studies have found that weak passwords, accidental data sharing, and falling for phishing scams are among the leading causes of security breaches. Researchers agree that understanding human behavior and improving user awareness are key steps in reducing cyber risks.

B. Cybersecurity Awareness and Education

Several studies highlight the importance of cybersecurity education and awareness programs. Training sessions, simulations, and workshops have been shown to significantly reduce human errors. For example, employees who receive regular cybersecurity awareness training are more likely to recognize suspicious emails and follow safe online practices. Many researchers also suggest that cybersecurity education should begin early, at the school or college level, so that individuals develop safe digital habits from a young age. Surveys and questionnaires, such as those conducted through online platforms like Google Forms, are commonly used to measure awareness levels and identify knowledge gaps.

C. Behavioral Patterns and Challenges

Research has also identified challenges in changing human behavior toward cybersecurity. Even when users are aware of risks, they often continue unsafe practices due to convenience, overconfidence, or lack of motivation. Studies emphasize that human behavior is influenced not only by knowledge but also by attitude, culture, and organizational environment. Some researchers propose combining technical measures with behavioral approaches such as gamification, motivation, and feedback to make security awareness more engaging and effective. However, maintaining consistent awareness and responsible online behavior among users remains a continuing

D. Practical Implementation and Data Collection

Data was collected using a structured Google Form survey focused on cybersecurity awareness, behaviour, and safe online practices. The survey included questions on password habits, phishing recognition, browsing safety, and social media awareness.

It was shared with students, professionals, and general users. All responses were kept anonymous and later analyzed to find common behavior patterns, awareness levels, and gaps related to cybersecurity risks.

4. Literature Review

1. Human Behavior and Cybersecurity:
Studies show that most cyber incidents happen due to human errors such as weak passwords, clicking unknown links, or ignoring security warnings.

2. Password Management:

Research finds many users reuse simple passwords and rarely change them, which increases the chance of attacks.

3. Phishing Awareness:

Many people still fail to identify phishing or fake emails, especially when messages appear professional or urgent.

4. Cybersecurity Training:

Regular awareness programs and practical training help users improve their online safety and reduce risky behavior.

5. Psychological Factors:

User attitude, motivation, and perception of risk strongly affect how carefully they behave online.

6. Psychological Factors:

Supportive workplace culture and clear policies encourage safe cybersecurity practices among employees.

7. Usability and Compliance:

Supportive workplace culture and clear policies encourage safe cybersecurity practices among employees.

8. Survey-Based Research:

Most studies use questionnaires or online surveys to measure awareness and behaviors — similar to this project.

9. Research Gap:

Many existing studies focus on technical threats, while fewer explore how human awareness directly affects cybersecurity outcomes.

10. Contribution of This Study:

This research helps understand how everyday user behavior, habits, and awareness impact cybersecurity and suggests ways to improve safe online practices.

5. Hypothesis

Main Hypothesis (H_1):

Human factors such as awareness, behavior, and online practices have a significant impact on cybersecurity threat mitigation.

Null Hypothesis (H_0):

Human factors such as awareness, behavior, and online practices do not have a significant impact on cybersecurity threat mitigation.

6. Methodology

A. Data Collection :

Information was gathered through a Google Form survey with questions about password habits, phishing awareness, safe browsing, and social media use. The form was shared with students, professionals, and general users. All responses were anonymous.

B. Sampling Method :

A convenience sampling method was used to collect responses from easily available participants from different backgrounds.

C. Data Processing And Analysis :

Incomplete or duplicate entries were removed. The data was organized and analyzed in Microsoft Excel using charts and percentages to find common patterns, awareness levels, and behavioural gaps..

D. Ethical Consideration :

All participation was voluntary, and no personal information was collected, ensuring privacy and confidentiality.

7. Data Analysis and Interpretation

This study examines how human behavior and awareness influence cybersecurity risks in organizations. The results show that while most participants understand common threats such as phishing, their actual online practices often do not match their knowledge. This gap between awareness and action makes systems more vulnerable to attacks. A key finding from the data is the Confidence-Risk Paradox people who are more confident in their ability to identify threats often take more risks, while those who are less confident tend to be more cautious and follow safer practices.

The study also found that a large number of respondents (78.6%) believe cybersecurity training is important, yet around 41.2% have never received formal awareness training. This highlights a major weakness in organizational security programs, which focus more on information sharing rather than hands-on, practical training. To address this, organizations should adopt interactive awareness sessions and reinforce safe behavior through strong security policies like Multi-Factor Authentication (MFA) and regular data backups.

The survey collected responses from 162 participants, mostly from the academic sector. While most participants claimed to follow safe practices, the data suggests that overconfidence and lack of consistent training continue to be major risk factors. Since the study relied on self-reported data, there may be some overestimation of safe behavior. Overall, the analysis concludes that human behavior remains one of the biggest challenges in cybersecurity, and improving awareness, training, and policy enforcement is essential for reducing risks.

Understanding who participated in the survey helps explain how the results relate to real-world cybersecurity behavior. The survey included 162 respondents from various backgrounds, mostly students and professionals in the academic sector. This mix provides insights into how different groups understand and handle cybersecurity risks.

However, since many participants were from educational institutions, the results mainly reflect the cybersecurity habits and awareness levels within that environment rather than across all industries.

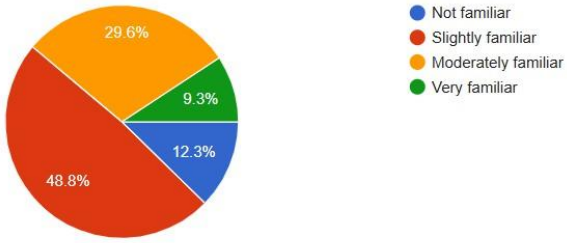

Figure 1: Familiarity with Cybersecurity Threats

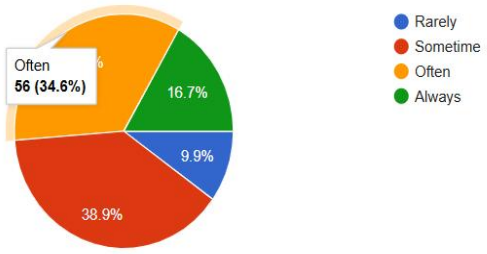

Figure 1: Frequency of Password Updates

Nearly 61% of respondents are only slightly or not familiar with cybersecurity threats, and only 9.3% are very familiar .This shows a lack of deep cybersecurity understanding, highlighting the need for better awareness training.

Most respondents update their passwords sometimes (38.9%) or often (34.6%), while only 16.7% always update them .This indicates moderate password awareness but inconsistent security habits

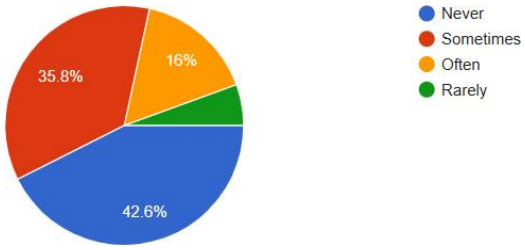

Figure 3: Email Link Verification Behaviour

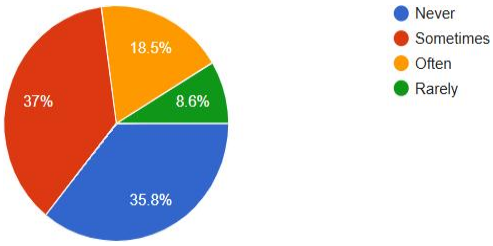

Figure 4: Reporting of Suspicious Cyber Incidents

About 42.6% never click unverified links, but 51.8% do so sometimes or often. This shows basic awareness but persistent risky behaviour among many users. The chart shows that most people either never or only sometimes report suspicious emails or cyber incidents, while very few report them often. This suggests low awareness or hesitation in reporting such issues.

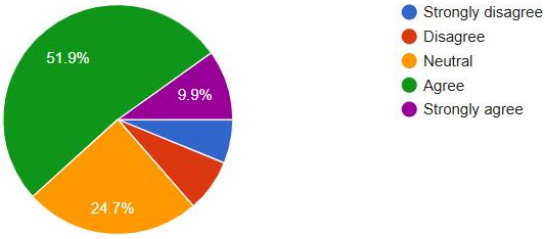

Figure 5: Belief About Human Errors in Cybersecurity

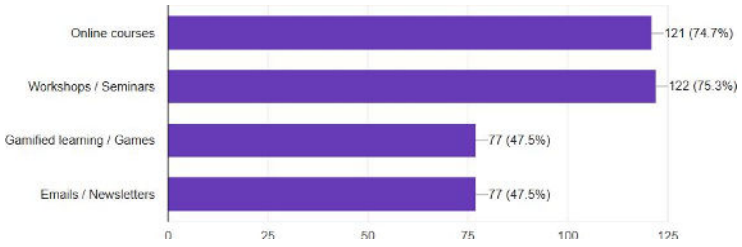

Figure 6: Preferred Cybersecurity Awareness Methods

The chart shows that most people believe human errors are a major cause of cybersecurity breaches. About 51.9% agree and 9.9% strongly agree, while 24.7% remain neutral. Only a small number disagree or strongly disagree. This means most respondents recognize that human mistakes play a big role in cyber risks. The chart shows that workshops or seminars (75.3%) and online courses (74.7%) are the most preferred ways to learn about cybersecurity. Fewer people prefer gamified learning and emails/newsletters (both 47.5%). This suggests that interactive and structured training methods are more effective for engaging participants.

8. Result and Discussion

The survey results show that most people have some knowledge of cybersecurity but do not always follow safe online habits. When asked how often they update their passwords, only 16.7% of participants said they *always* update them, while 34.6% said they do it *often* and 38.9% said *sometimes*. A smaller group of 9.9% admitted that they *rarely* change their passwords. This means that nearly 74% of people update their passwords irregularly, which can increase the chance of unauthorized access or password-related attacks.

In the question about familiarity with cybersecurity threats, only 9.3% said they were *very familiar* with such threats, and 29.6% said *moderately familiar*. However, a larger part of the group 48.8% said they were *slightly familiar*, and 12.3% said they were *not familiar* at all. This shows that around 61% of people have only a basic understanding of cybersecurity risks, while less than 10% have strong knowledge. The responses to the question about clicking on links in emails without checking the sender showed that 42.6% of people *never* click on unverified links, which is a good sign of cautious behaviour. However, 35.8% said they *sometimes* do it, 16% said they *often* do it, and 5.6% said they *rarely* avoid it. Together, this means that over 57% of people still engage in risky behaviour online at least occasionally, making them vulnerable to phishing attacks or data theft. The survey results show that 37% of people sometimes report suspicious cyber incidents, while 35.8% never report them. Only 18.5% report often, and 8.6% rarely do. This means that most people either don't report or do it irregularly.

In another question, 51.9% of respondents agreed and 9.9% strongly agreed that human errors are a major cause of cybersecurity breaches, while 24.7% stayed neutral and only a small number disagreed.

When asked about preferred learning methods, 75.3% of people chose workshops or seminars, 74.7% preferred online courses, and 47.5% each liked gamified learning and newsletters. The findings suggest a clear gap between what people *know* about cybersecurity and how they *behave* online. Most respondents understand that password management and cautious email behaviour are important, but they often do not follow these practices regularly. For instance, even though 89% of participants change their passwords at least sometimes, only 16.7% do it every time, which is far below the level required for strong protection. This indicates that people tend to act safely only when it feels convenient or necessary, not as a regular habit.

The low familiarity rate—where about 61% of respondents said they were only slightly or not familiar with cyber threats—shows that awareness programs have not reached their full effect. People may know common terms like "virus" or "phishing," but they may not fully understand how these attacks work or how to prevent them. This limited knowledge can lead to mistakes like clicking on suspicious links, which over 57% of respondents admitted doing at least sometimes.

These patterns reveal that the main problem is behavioural, not technical. People often have access to cybersecurity tools or information but do not apply them regularly. This happens due to overconfidence, forgetfulness, or lack of motivation. To address this issue, organizations should focus on continuous education and reminders rather than one-time training. Simple measures like monthly tips, short quizzes, or simulated phishing emails can help users become more alert. Also, using positive reinforcement, such as small rewards for following safety rules, can encourage long-term good habits.

The findings show that even though many people understand the importance of cybersecurity, they are not consistent in reporting incidents. This could be due to lack of awareness, confidence, or unclear reporting processes. At the same time, most respondents recognize that human errors play a big role in causing cyber issues. This shows that employees are aware of their responsibility but still need more practical training.

The responses also highlight that people prefer interactive ways of learning like workshops and online courses over passive methods such as newsletters. These methods help them understand real-world cyber risks better.

9. Conclusion

In conclusion, the survey results show that people are aware of cybersecurity risks but do not always act safely. Only 16.7% always update passwords, while more than 70% do so irregularly. Around 61% have low familiarity with cyber threats, and over 57% still click on unknown links occasionally. This clearly proves that awareness alone is not enough to ensure safety—consistent behaviour and practice are just as important.

To improve cybersecurity at the human level, organizations and individuals need to focus on building habits, not just knowledge. Regular and simple training sessions, easy-to-follow security rules, and friendly reminders can help people act safely online. If these measures are applied consistently, the level of cyber risk caused by human error can be greatly reduced, leading to a safer digital environment for everyone.

Overall, the survey indicates that while awareness about cybersecurity and human errors is high, active reporting of suspicious activities is still low. To improve this, organizations should encourage regular reporting, simplify the reporting process, and conduct frequent workshops or online training sessions. Focusing on interactive learning and building a culture of responsibility can help reduce human mistakes and strengthen overall cybersecurity awareness among employees.

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