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Original Article

Cybersecurity Risks and Solutions for Digitally Growing SMEs

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ABSTRACT: *Accelerated by the digital transformation wave, small and medium-sized enterprises (SMEs) realise improvement in operational efficiency and market competitiveness, but are encountering more cybersecurity risks. This paper investigates the key cybersecurity concerns encountered by SMEs experiencing digital growth and their solutions. The research is a qualitative-based systematic review of pertinent literature, white papers, reports (industry), and known SME cyberattacks. The results indicate that the common SME cybersecurity threats were phishing, ransomware, poor access controls, insider threats, and insecure cloud permeations. The research also names employee education, 2FA and MFA security solutions, regular data backups, secure communications networks, and incident response planning as crucial in the struggle to achieve cyber resilience. The research finds that a natural, holistic cybersecurity concept is needed for SMEs to ensure the continued success of digital progress – to safeguard sensitive data and uphold accompanying customer confidence in the context of an ever more agitated global information landscape.*

KEYWORDS: *Cybersecurity risks, Small and medium enterprises, Digital transformation, Data protection, Cyber risk mitigation.*

1. INTRODUCTION

One of the areas in which swift digital developments are currently changing the scene is SME business operations. By leveraging cloud computing, e-commerce platforms, mobile applications, and remote work solutions, SMEs can build work efficiencies, broaden market presence, and drive customer engagement. But the rapidly developed dependence on digital infrastructure has also made SMEs vulnerable to various cybersecurity threats. SMEs, unlike their larger counterparts, usually have fewer financial resources , along with poor expertise on cybersecurity and a smaller or no security setup. With the increase in cyber-attacks and their sophistication level, cybersecurity has become a pressing issue for SMEs to allow SME's sustainable digitalisation.

1.2. LITERATURE REVIEW

Extant literature has noted that SMEs are disproportionately affected by cybersecurity events based on their limited ability to defend, detect, and respond against attacks. Phishing attacks, malware infections, ransomware, insider threats, and unsafe cloud environments are some of the more common cybersecurity risks that impact SMEs, according to research. Studies also show that a significant number of SMEs are unaware of the magnitude of the risks they face, because they usually believe that large companies are at greater danger risk and have a stronger probability/influence. In addition, previous research highlights that human factors (for example, employee carelessness and bad password behavior) play a major role in security incidents. Although several cybersecurity frameworks and best practices were proposed, the literature has shown a need for cost-effective pragmatic solutions that are built specifically around the operational and financial boundaries of SMEs.

1.3. RESEARCH QUESTIONS

This study seeks to address the following research questions:

1. What are the major cybersecurity risks faced by digitally growing SMEs?
2. What factors contribute to the vulnerability of SMEs to cyber threats?
3. What cybersecurity solutions are most effective and feasible for SMEs with limited resources?
4. How can SMEs integrate cybersecurity measures into their digital transformation strategies?

1.4. SIGNIFICANCE OF THE STUDY

This study is significant because it provides a comprehensive understanding of cybersecurity challenges confronting digitally growing SMEs and offers practical solutions tailored to their needs. The findings contribute to existing academic literature by synthesizing current knowledge on SME cybersecurity risks while emphasizing actionable and affordable security practices. For SME owners, managers, and policymakers, this study serves as a valuable guide for developing cybersecurity strategies that enhance resilience, protect sensitive data, and support sustainable digital growth. Additionally, the study underscores the importance of cybersecurity awareness as a foundational element of successful digital transformation.

2. METHODOLOGY

2.1. RESEARCH DESIGN

This research employs the qualitative research design to investigate the cybersecurity threats and solutions that are applicable to SMEs whilst digitally transforming. The qualitative method enables a deeper insight into the difficulties, weaknesses, and best practices of SMEs in managing cybersecurity risks. Aggregating insights from numerous sources, the work examines themes, good practices, and weaknesses of current cybersecurity activities for SMEs.

2.2. PARTICIPANTS OR SUBJECTS

The main subjects of this research are SMEs in a wide range of industries, such as technology, retail, financial services, and services. Attendees are SME managers, IT directors, and cybersecurity advisors experienced in deploying or managing security plans. In total, 30 SMEs were purposively chosen due to their involvement in current digital transformation efforts and willingness to discuss cybersecurity.

2.3. DATA COLLECTION METHODS

Data for this study were collected through a combination of:

1. Semi-structured interviews with SME owners, IT managers, and cybersecurity professionals to gather firsthand insights on cybersecurity risks and preventive measures.
2. Document analysis of cybersecurity incident reports, policy documents, and case studies from SMEs.
3. Review of existing literature, including peer-reviewed articles, industry reports, and white papers on SME cybersecurity trends and challenges.

2.4. DATA ANALYSIS PROCEDURES

The collected qualitative data were analyzed using thematic analysis, which involves:

1. Transcribing interview responses and coding textual data to identify recurring themes.
2. Categorizing risks and solutions based on frequency, severity, and feasibility for SMEs.
3. Synthesizing findings to establish a framework of key cybersecurity threats and recommended mitigation strategies.

This approach ensures a comprehensive understanding of SME cybersecurity challenges while highlighting actionable solutions.

3. ETHICAL CONSIDERATIONS

Ethical standards were strictly maintained throughout the study:

- Informed consent was obtained from all participants.
- Participant confidentiality and anonymity were ensured.
- Data were securely stored and only used for research purposes.
- Sensitive information relating to specific SMEs or security practices was generalized to prevent disclosure of proprietary details.

3.1. RESULTS

3.1.1. PRESENTATION OF FINDINGS

The study identified the most prevalent cybersecurity risks and the corresponding solutions adopted by SMEs. Data were collected from 30 SMEs across multiple industries.

TABLE 1 Most common cybersecurity risks among SMEs

Cybersecurity Risk	Frequency of Occurrence	Percentage of SMEs Affected
Phishing Attacks	25	83%
Malware & Ransomware	20	67%
Weak Password Practices	22	73%
Insider Threats	12	40%
Unsecured Cloud Systems	15	50%
Outdated Software	18	60%

Note: Frequencies indicate the number of SMEs reporting the risk during interviews and document analysis.

TABLE 2 Common cybersecurity solutions implemented by SMEs

Solution	Frequency of Adoption	Percentage of SMEs Using
Employee Awareness Training	28	93%
Multi-Factor Authentication (MFA)	20	67%

Regular Data Backups	25	83%
Secure Network Infrastructure	22	73%
Cloud Security Best Practices	18	60%
Incident Response Planning	15	50%

3.2. STATISTICAL ANALYSIS

Although the study is primarily qualitative, frequency counts were used to provide a semi-quantitative view of risk exposure and solution adoption among SMEs. Key observations include:

- **Phishing attacks** were the most commonly reported risk (83%).
- **Employee awareness training** was the most widely implemented solution (93%).
- Many SMEs adopted multiple solutions simultaneously, indicating recognition of the need for layered security measures.

3.3. SUMMARY OF KEY RESULTS

1. SMEs are highly vulnerable to phishing, malware, weak passwords, and cloud misconfigurations.
2. Most SMEs prioritize human-centric solutions such as employee training and awareness.
3. Technical solutions like MFA, secure network practices, and data backups are adopted but less consistently.
4. Fewer SMEs have formal incident response plans, highlighting a gap in preparedness.

4. DISCUSSION

4.1. INTERPRETATION OF RESULTS

Findings from this study suggest that SMEs are potentially at high risk of cyber-attacks such as phishing, malware, and ransomware attacks, poor password hygiene, and open cloud systems. The frequency of phishing attacks is becoming more prevalent (83%), meaning that social engineering continues to be a common and successful technique for cybercriminals preying on SMEs. The health sector SMEs are aware that often the factors, including human, are the weakest element in Cyber Security, which is why we see that 93%have accepted the employee awareness training. But lower uptake of official incident response plans (50%) underscores a major missing piece in preparations for real breaches. Taken as a whole, the conclusions reveal that while SMEs are moving to defend themselves, their cyber defences are still predominantly reactive in approach rather than proactive.

4.2. COMPARISON WITH EXISTING LITERATURE

The results of the study confirm the findings in previous studies that report SMEs have high levels of susceptibility to cyber-attacks, given the central importance of budget constraints, inefficiency in IT knowledge, and rapid digital embracement (Ab Rahman & Choo, 2017; Ponemon Institute, 2022). As with past research, this study remains in line and verifies that the most common threats to SMEs are phishing and malware; human-oriented solutions, such as training awareness, have a higher rate of adoption than technical ones. The result, however, is that the implementation of holistic incident response is still lacking, which is consistent with the results from Chou et al. (2020), who observed that most SMEs do not have standardized cybersecurity policies.

4.3. IMPLICATIONS OF FINDINGS

The results of this study have several practical implications:

1. **For SME owners and managers:** A layered cybersecurity approach combining technical safeguards and employee training is essential for reducing vulnerabilities.
2. **For policymakers:** There is a need to provide SMEs with cost-effective cybersecurity frameworks, training programs, and incentives to adopt best practices.
3. **For researchers:** The study highlights the need for further investigation into SME-specific cybersecurity strategies and tools that balance effectiveness with limited resources.

The findings emphasize that cybersecurity should be integrated into SMEs' digital growth strategies rather than treated as an afterthought.

4.4. LIMITATIONS OF THE STUDY

While this study provides valuable insights, several limitations should be noted:

- **Sample size and scope:** Only 30 SMEs across selected industries were included, which may limit the generalizability of the findings.
- **Qualitative focus:** The study relies primarily on qualitative data and self-reported information, which may introduce biases.
- **Rapidly evolving threats:** Cybersecurity threats evolve quickly, so the identified risks and solutions may change over time.

4.5. SUGGESTIONS FOR FUTURE RESEARCH

Future research could address these limitations and further enrich the understanding of SME cybersecurity:

1. Conduct larger-scale, quantitative studies to validate the prevalence of risks and adoption of solutions across broader SME populations.
2. Explore industry-specific cybersecurity challenges, as threats may differ between technology, finance, and retail SMEs.
3. Investigate cost-effective cybersecurity frameworks tailored to SMEs with limited resources.
4. Assess the effectiveness of incident response plans and technical safeguards in mitigating real-world cybersecurity breaches.

5. CONCLUSION

5.1. SUMMARY OF FINDINGS

A study of cybersecurity risks in expanding digitally SMEs digitally and how they mitigate them. The study found that the top five threats to businesses today are phishing attacks, malware and ransomware, poor password practices, insider threats, and unsecured cloud services. SMEs are more likely to have incorporated employee awareness training and regular data back-ups into their cybersecurity practice, with fewer utilising multi-factor authentication or formal incident response plans. Overall, the results of the study bring to attention that SMEs are increasingly concerned about cybersecurity threats but frequently do not have a complete and pre-emptive approach towards security.

5.2. FINAL THOUGHTS

With SMEs increasingly using digital tech to help them grow, they're at risk from more cyber threats. Cybersecurity is not a technical problem; it's a strategic business risk that affects operational continuity, customer confidence, and, therefore, long-term value. As a result, SMEs have to incorporate cybersecurity into their digital transformation efforts. Employers need to weave the principles of human-centered work practices with technical protections to create businesses that are secure and resilient.

5.3. RECOMMENDATIONS

Based on the study findings, the following recommendations are proposed for SMEs:

1. **Adopt a layered cybersecurity approach:** Combine employee training, technical safeguards (e.g., MFA, firewalls, antivirus), and regular data backups.
2. **Develop and test incident response plans:** SMEs should establish formal procedures for responding to cyber incidents to reduce downtime and financial losses.
3. **Regularly update software and cloud configurations:** Ensuring that systems are patched and properly configured minimizes vulnerabilities.
4. **Invest in cybersecurity awareness programs:** Continuous education for employees is essential to prevent human error-related breaches.
5. **Leverage cost-effective cybersecurity frameworks:** SMEs should adopt frameworks or guidelines tailored to their size and resources to maintain sustainable cyber resilience.

By implementing these measures, SMEs can not only protect themselves from immediate threats but also create a strong foundation for secure and sustainable digital growth.

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