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Strategies to Enhance Cybersecurity Performance in Jordanian Banks

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Abstract: **-** The increasing digitization of financial services has had some immediate impact on cybersecurity, which is also a major concern for banks operating outside Jordan. This paper aims to identify the cybersecurity challenges of Jordan banks align and provide integrated electronic strategies. Strategies will include developing a regulatory framework, using advanced technology, providing training for employees, and strengthening private-public partnerships. The adoption of these preventive measures enables banks in Jordan to protect their assets and customers from cyberattacks thereby contributing to financial stability.

Keywords— Cybersecurity, Jordanian banks, advanced technologies financial services, challenges.

I. INTRODUCTION

The digitalization of banking in Jordan has advanced to the stage where online, mobile and cloud services have all become common place. Yet, as these data becomes digitalized the threat of cybercrime comes in action too. Banks face the possibility of having financial losses, confidential customer data being exposed and damaged brand reputation due to cyber-attacks [1]. Some of the recent incidents involving phishing, ransomware and Advanced Persistent Threats (APTs), have shown a mandatory for Jordan's banking sector to adopt strong cybersecurity strategies which impose a significant threat [2]. With the expanding threat landscape Jordanian banks face numerous challenges with striking infrastructure, regulatory support and expertise required to adequately control and contain cyber risk [3]. Traditional cybersecurity strategies are generally reactionary and aimed at containment rather than prevention. This study aims to highlight the determinants of cyber security threat facing Jordanian banks and propose strategies that could enhance their level of performance in implementing sizes escalation techniques. This research study is aimed to satisfy the following basic objectives:

1-to find out the significant cybersecurity challenges encountered by Jordanian banks.

2-To gauge the performance of current cybersecurity defenses.

3- Declare strategies to enhance cybersecurity performance in Jordanian banks.

4-To map the challenges that may be faced to implement these strategies.

This is an important result for a broad set of stakeholders in the banking sector, including bank managers, security analysts and regulators. Cybersecurity is not only a critical measure for protecting Jordanian assets, but it also ensures the stability of its financial system and customer trust [4]. The first study enhances the literature by presenting actual lessons learned in applying TA to solve real problems that face practitioners in banking sector like Jordan.

II. LITERATURE REVIEW

2.1 Global Cybersecurity Challenges in the Banking Sector

The banking industry has witnessed a massive increase in cyber-attacks due to the expansion of digital technology across global borders. Cybercriminals target banks because they keep an enormously valuable financial data of their clients. Phishing — Malware — Ransomware; Insider threats are popular attack vectors [5]. As the Banking sector evolves one can see many of them have adopted improved cyber security technologies like automation, threat detection observed through AI driven systems and also included multi-factor authentication (MFA) to process payments in using block chain technology for secure transactions [6].

2.2 Cybersecurity Landscape in Jordan

Cybersecurity in Jordan is a nascent ecosystem that has yet to fully mature. A list of cybersecurity recommendations prepared by the Central Bank of Jordan as well, although not reflected in operational frameworks developed with banks [7]. Not to mention, there are higher risks in this region as we know that Jordanian banks operate within the Middle Eastern geopolitical context courts getting wary of state-led cyber-attacks [8]. Jordan is

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a recent example where many banks continue to use legacy systems that are not equipped for modern cybersecurity threats [9].

2.3 Existing Cybersecurity Measures in Jordanian Banks

Typical cybersecurity measures in use by Jordanian banks are firewalls, encryption and IDS. These measures are however by and large out-dated, un-integrated solutions that severely fall short of the sophisticated threat [10]. Another significant issue is the lack of enforcement around required cybersecurity policies by regulators, and most banks are only starting to take a more proactive stance on security (as opposed to simply responding) [11].

2.4 Regulatory Environment and Compliance

When compared to global norms, Jordan has an underdeveloped cybersecurity regulatory environment. Sometime guidelines introduce by the Central Bank of Jordan [12], but this is not a full spectrum privacy and security from cyber threat. This means the enforcement mechanism is not strict enough and different banks comply at deferent level [13]. It does also indicate the requirement for a more comprehensive regulatory regime and why banks needs to follow world-wide standards like ISO/IEC 27001 management framework of information security [14].

2.5 Human Factors in Cybersecurity

Bank cybersecurity breaches one of the most common causes related to human error A wide spread lack in cybersecurity awareness is found internally with bank employees, which ends up leading to insider threats within Jordan [15]. Most of the training programs also are not enough and employees often do not have required skills to recognize or react properly towards cyber threats [16].

2.6 Technological Advancements and Cybersecurity

It is because technology advancement comes with all the opportunities and challenges of cybersecurity in banks. Some of the emerging technologies that may improve cybersecurity capabilities include artificial intelligence (AI), machine learning (ML) and Blockchain. In this paper, we will show that AI and ML can provide real-time threat detection and response for Blockchain systems using innovative techniques with blockchain to be verified by transactions securely. Nonetheless, large investment and specialism are required to deploy such technologies in Jordan since banks' clustering all services will be faced many issues.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study employs a mixed-methods research design, combining both qualitative and quantitative approaches. The qualitative component includes in-depth interviews with cybersecurity experts, IT managers, and regulatory officials in Jordan, while the quantitative component involves a survey distributed to bank employees to assess their cybersecurity awareness and practices.

3.2 Data Collection

Data were gathered via semi-structured interviews and surveys. Interviews were held with important stakeholders in Jordan's banking sector to acquire insight into cybersecurity concerns and measures. Surveys were provided to a random sample of workers from major Jordanian banks to assess their awareness and adherence to cybersecurity policies.

3.3 Data Analysis

Thematic research was used to discover reoccurring themes connected to cybersecurity challenges and strategies. Quantitative data from surveys were evaluated using statistical approaches such as descriptive statistics and correlation analysis to determine the relationship between employee awareness and the effectiveness of cybersecurity measures.

3.4 Limitations

This study has limitations, including the possibility of bias in self-reported survey data and the limited scope of interviews, which may not fully represent Jordan's banking sector. Furthermore, because cyber dangers evolve so quickly, the findings may need to be evaluated on a frequent basis to be relevant.

IV. IV. FINDINGS

4.1 Cybersecurity Challenges in Jordanian Banks

The report on the research documented the following major issues related to cybersecurity in banks of Jordan:

- Most banks still operate on legacy systems that place them at the risk of cyberattacks. This is because these systems are not capable of incorporating up to date cybersecurity features.
- Inadequacies in the legal framework in Jordan stifle the banks from having all inclusive cybersecurity measures. There is an absence of periodic compliance reviews and poor penalties for violations.
- Insufficient Employee Training: There was no proper security training for bank employees on cybersecurity issues. Most bank staff did not know basic security measures against threats, such as phishing attacks, or the use of multi-factor authentication.
- Regardless, budget limitations present challenges to Jordanian banks in terms of cyber security systems and trained personnel

4.2 Current Cybersecurity Practices

The survey discovered that although some steps towards cybersecurity have been taken by the Jordanian banks, they remain rather disjointed and have little mutual cooperation. Firewalls and intrusion detection systems (IDS) are common, however, they barely function with different systems security solutions, leading to some coverage being left unattended. Besides, these many banks have not embraced the emerging technologies such as AI and private blockchain that would placed them in a much secure environment.

4.3 Employee Awareness and Behavior

Bank employees polled demonstrated low cybersecurity awareness — source: the survey results. A significant portion of individuals indicated that they are never trained in proper cyber-protective measures, and most would be unable to identify common online threats (This limit of knowledge increases the odds for insider attack in a way by both negligence and deliberate purposes

4.4 Impact of Regulatory Compliance

Regulatory compliance spectrum across Jordan's banks explicates in the survey Only a few banks have conformed to international norms, the rest still find it challenging to fulfill even basic requirements of Jordan's Central Bank. Lack of standardization in compliance creates gaps all over the financial industry.

V. DISCUSSION

5.1 Enhancing Cybersecurity Performance

Adopting Advanced Cybersecurity Technologies

Modern cybersecurity solutions need to be adopted across Jordanian banks, in order for them adequately resist cyber attacks. As such, the implementation of AI and machine learning (ML) technologies can aid in enhancing threat detection/response capabilities by analyzing large real-time data sets to discover patterns indicative of a potential cyber intrusion. Safety of transactions can also be imple- mented by using blockchain technology, This way the risk of fraud or unauthorized access will be reduced as described in. However, the implementation of these technologies requires long-term investment and trained personnel to manage those systems.

Strengthening Regulatory Frameworks

This means that some kind of order has to be established in the field, but a normative base would make it easier for security to develop effectively throughout Jordanian institutions. The Central Bank of Jordan needs to develop tighter regulations and implement them throughout the sector by sharing intelligence with international cybersecurity agencies. Some of these aspects are: regular audits, compulsory incident reports and penalisations for non-compliance. Moreover, having banks comply with international standards like ISO/IEC 27001 provides a solid basis for ensuring best practices in information security management are followed.

Enhancing Employee Training and Awareness

Where Jordanian banks are in need of good regulations for enhancing their cyber security. The Central Bank of Jordan needs to collaborate with international cybersecurity institutions and establish much stricter laws that are applied evenly throughout the industry. Adequate auditing, reporting of incidents and financial penalties Additionally, banks should be required to follow international standards (e.g., ISO/IEC 27001) so as to ensure their adoption of the best practices in information security management.

Fostering Public-Private Partnerships

United for a Stronger Cybersecurity Performance of Jordanian Banks by Public-Private Partnerships (PPP) Banks can also leverage advanced cybersecurity technology and threat intelligence best practices used by collaborating govt agencies, international organisations & other financial institutions Likewise, PPPs can also help to create a national cybersecurity policy that complies with the global frequency and enables coordinated reactions against cyber attacks.

5.2 Potential Challenges in Implementation

These are easier said than done. The challenge is budget, resistance to change and the rapidly evolving threat landscape. Costly and sophisticated technologies as well as training programs may be beyond the resources of banks that operate in a competitive financial market, where cost control is essential. In addition, staff and management may be refractory to changes in current systems if they view them as disruptive or not needed. Finally, in light of the evolving nature of cyber threats and risks; banks need to be resilient by updating their cybersecurity procedure on a regular basis due to possible new threats.

VI. RECOMMENDATIONS

6.1 Prioritization of Cybersecurity Investments

Cybersecurity investment update: Make it a risk issue Jordanian banks need to approach cybersecurity as any other aspect of their risk management, which needs institutionalization from all levels. E.g., the necessary capital needs to be enshrined: updating technologies, training staff and establishing regulatory compliance.

6.2 Development of a National Cybersecurity Strategy

A national cybersecurity policy for the banking industry, developed by The Central Bank of Jordan together with other involved stakeholders. This strategy should include explicit standards and requirements, ongoing inspections, as well oversight of a system for collaboration between the public and private sector.

6.3 Continuous Monitoring and Improvement

No matter where they are headquartered, banks need to adopt a security-guard-like “always on duty” attitude towards their cybersecurity by continually stress-testing the system for weaknesses and tightening up gaps. Such stakeholders would have the duty to comply with new regulations i.e. running monthly penetrate tests, updating security policies and being in the know of recent cyber threats.

6.4 Promotion of Cybersecurity Culture

Building a cybersecurity culture inside banks is not to underestimate human error and cut down on risk. It emphasizes that this can be achieved by providing proper training, awareness campaigns and integrating cyber-security as a core value into organizations operations.

VII. CONCLUSION

Improving cybersecurity performance at banks in Jordan is essential to protect the financial industry from the increasing threat of cyberattacks. Jordanian banks can significantly improve their cybersecurity posture by implementing modern technology, strengthening regulatory frameworks, increasing employee training and promoting public-private partnerships. However, the successful implementation of this strategy requires the commitment of all stakeholders, including banks, regulators and government agencies. As cyber risks evolve, Jordanian banks must remain vigilant, proactive and adaptive in order to preserve financial security and stability.

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