When it comes to the topic in which I looked to further my research into, it would have to be the importance of blockchain technology. Blockchain technology has revolutionized the digital world, bringing a new perspective to security, resilience, and efficiency of systems (Ahram et al., 2017). Blockchain technology is one of the most crucial innovative technologies around the globe, due to the number of fields it advances, this includes cybersecurity, finance, healthcare, and even supply chain. Blockchain can be defined as a network of computers, all which must approve a transaction that has taken place, before it is recorded in a chain of computer code (Ahram et al., 2017). The detail of this transaction is then recorded on a public ledger for all to view. The reason blockchain technology is so crucial to the field of cybersecurity, is due to it being able to aid within a variety of different cybersecurity research areas including decentralized identity management, immutable audit trails, and even secure supply chain management (McCann, 2024). However, one of the most crucial areas, blockchain technology, has been able to help advance in the field of cybersecurity, is through its use in active defense. Since attackers continue to become more sophisticated in their attack methods utilizing emerging technologies to aid in large scale data manipulation, and AI driven malware attacks, blockchain looks to locate a solution to help mitigate these issues. Opposite to normal defense systems blockchain technology provides strong security properties due to it not having a centralized control entity (Lee & Kim, 2021). This allows for reducing a single point of failure on normal defense systems, due to issues such as unauthorized access gained by an attacker, betrayal, or even accidental human mistakes. The use of blockchain technology also allows for increase visibility, due to its shared ledger structure, this helps improve the visibility of data, which overall would help organizations in responding to cyber-attacks at a much faster rate, and increase resiliency within the organizations cyber posture (Lee & Kim, 2021). The way in which

blockchain technology conducts this process, is through its use of displaying data from generation to process, transformation and ending (Lee & Kim, 2021). This allows all participants to see either who created data or even who processed data. Another method in which blockchain technology can utilize active defense within the digital realm, is through its use of audibility. Due to the blockchain data structure utilizing a continuous hash chain, it makes it literally impossible to erase or modify data in the middle of the blocks (Lee & Kim, 2021). This helps in ensuring that security professionals of an organization can retrieve auditability for the systems data for defense. Which is a major issue for many cyber organizations globally within both public and private sectors, due to attackers being able to tamper with log data and remove detections of evidence.

Overall, the use of blockchain technology is critical within the cybersecurity field, due to the constant advancements of attack methods that are used by threat actors. This is due to original cyber defense systems, not being able to keep up with adapting cyber-attacks. While threat actors continue to leverage various emerging technologies, to aid in their attacks such as AI driven malware and large-scale data manipulation. It is critical for organizations to adopt resilient, transparent, and untampered systems such as Blockchain, to help better protect orginzational assets from being tampered with or even exfiltrated.

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