MOODY'S RATINGS

SECTOR IN-DEPTH
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Banks – Global

Arms Race: Deep defenses will help banks navigate cyber threats from new AI models

Cutting-edge AI models are accelerating the discovery of software vulnerabilities at a pace that outstrips the ability of most organizations to patch them. Anthropic's Claude Mythos model, released to a limited number of organizations in early April, has autonomously identified thousands of previously unknown software flaws across every major operating system and web browser, marking a step change in the cyberthreat landscape. Anthropic has not released Mythos to the general public because of the severe cybersecurity risks it poses. The largest US banks were among an initial set of organizations given early access to the model as part of an initiative called Project Glasswing to allow them to test their cyber security defenses and detect software vulnerabilities. OpenAI released a similarly capable model called GPT-5.4-Cyber a week later, again to a limited number of organizations.

Banks and other financial institutions are prime targets for cyberattacks given the amount of customer funds and data held, the criticality of their payments infrastructure, the confidence-sensitive nature of their business, and their interconnectedness to the rest of the economy. AI developments are therefore particularly credit relevant for them. But banks' longstanding investment in cyber resilience and their regulatory discipline mean they are better positioned than most to defend against these threats. While the analysis in this report focuses on banks, the broader implications extend to other financial institutions, which face many of the same cyber risks but may have weaker cybersecurity defense.

» **Leading AI models pose a heightened threat to the financial system.** The latest AI models are significantly better at detecting software vulnerabilities and pose increased risk to banks and the overall financial system if security and confidence in these institutions deteriorate. Larger institutions are bigger targets, but smaller ones are more vulnerable due to their more limited resources.

» **Cybersecurity spending likely to rise, but companies can leverage AI too.** Heavy regulatory oversight of banks provides internal control discipline that contributes to more robust cyberdefenses than most companies, but smaller financial institutions with weaker controls or less resources likely need to increase cyber spending in order to properly defend against AI-enabled attacks. Nevertheless, all companies can leverage the new AI models for better self-defense through faster vulnerability detection.

» **Legacy architecture is the primary weakness**. Outdated internal systems where software has not been patched for years are the most vulnerable to exploitation by cyber attackers. Patching should become more frequent and internal systems should operate on a zero-trust model to limit attackers' movements through the organization in the case of a breach.

Leading AI models pose a heightened threat to the financial system

Governments around the world have expressed concern that a technology as powerful as Mythos could pose a threat to financial stability.[1] As threat capabilities evolve rapidly, financial institutions will face increasing pressure to accelerate their response frameworks, reducing reaction times to detect, assess and contain AI-driven cyber incidents.

Leading AI capabilities around the world remain concentrated in the US and, to a growing extent, China. Most financial firms globally are consumers of cutting edge AI technology, creating a dependency on a small number of providers for both the offensive cyber tools that may be used against them and the defensive capabilities needed to protect themselves. While the credit implications are manageable for now, the pace of change will require banks to continue to treat cyber resilience as a strategic priority.

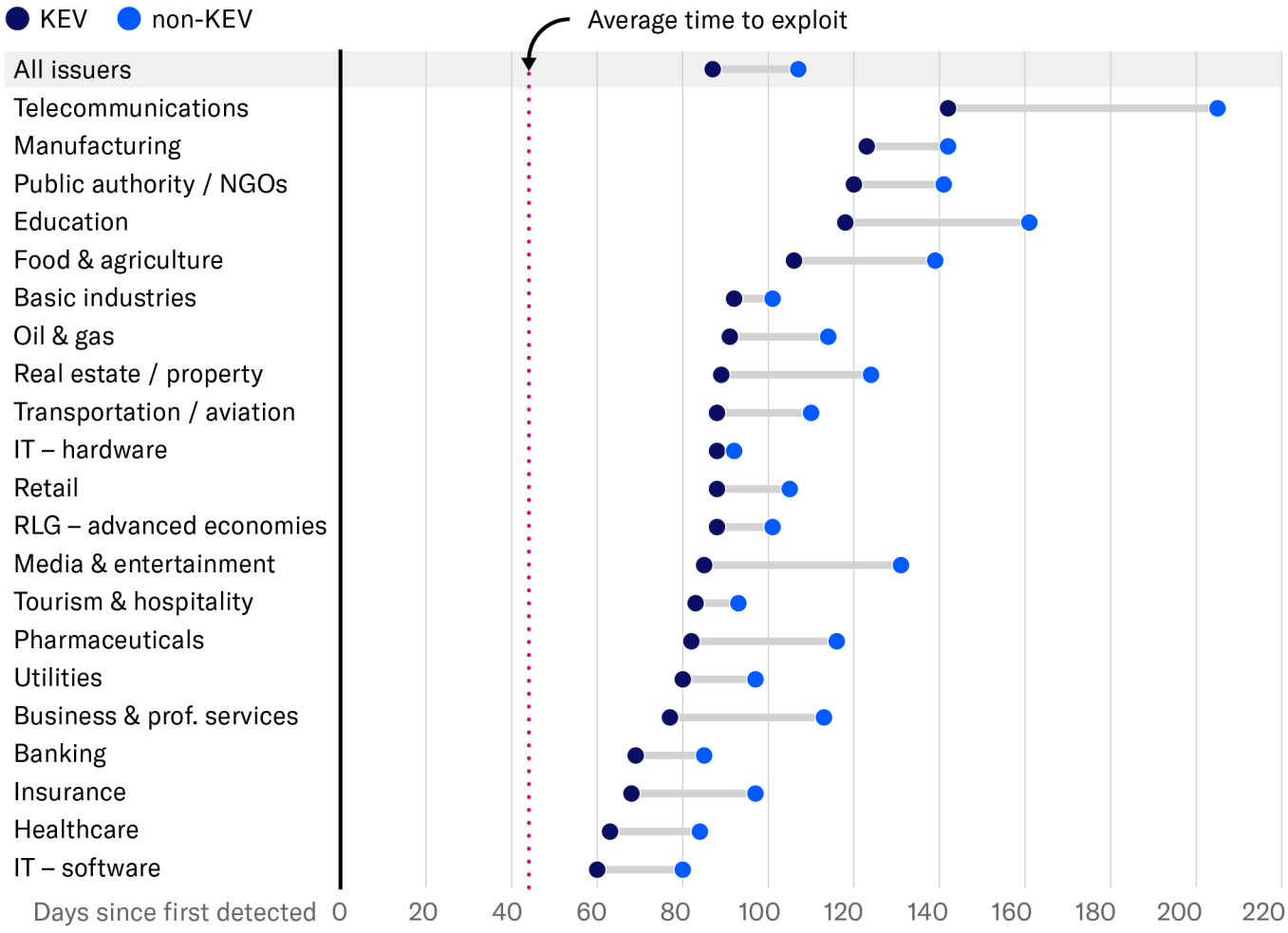
Large financial institutions have a broader attack surface area for network intrusion, but smaller institutions are more vulnerable from a defense preparedness and resource allocation perspective. According to IBM, the average cost of a US data breach is $10.2 million - an all-time high.[2] With Mythos, the magnitude and sophistication of attacks are likely to increase, which could increase the total cost. Companies will need to fix their software vulnerabilities faster than malicious actors can exploit them.

These AI advances show the risk to banks is real and growing. Banks hold vast amounts of customer funds and data, maintain critical payments infrastructure, and operate complex IT systems. Failure to manage these responsibilities in a secure manner could lead to significant reputational damage and financial repercussions. For instance, a severe ransomware attack that disrupts services for an extended period could quickly become a threat to creditworthiness, potentially eroding confidence and liquidity.

While software vulnerabilities are a leading cause of cyber breaches, phishing and other forms of social engineering targeting the human element also remain significant attack methods. According to Google research[3], vulnerability exploitation was the single most frequent initial access method observed in 2024, responsible for roughly a third of confirmed network intrusions.

AI tools can uncover flaws faster than most organizations can remediate them. The gap between attacker speed and defender response is widening. According to Moody's research, the average time for an attacker to exploit a software weakness fell to just 44 days in 2025, while median remediation times for such vulnerabilities was 87 days across all sectors. Banking sector remediation time was better at 69 days (see exhibit below):

Exhibit 1
Patching speed for financial institutions better than most sectors
Median number of days to remediate vulnerabilities, by sector



Source: Moody's Ratings

Cybersecurity spending is likely to rise, but companies can leverage AI too

Banks are better positioned than most sectors to manage these risks. Our 2025 cyber survey of 228 banks worldwide[4] found that banks follow more robust cybersecurity practices than other sectors. Nearly all the banks surveyed have adopted cyber vulnerability management programs and patch management policies, and the share allocating more than 10% of their technology budgets to cybersecurity continues to grow. Regulatory frameworks such as the EU's Digital Operational Resilience Act (DORA) or the Federal Financial Institutions Examination Council (FFIEC) operational resilience and cybersecurity framework in the US, enforce minimum standards for financial institutions across incident response, data backup and third-party risk management.

Financial institutions will need to increase spend to defend themselves. The impact as a percentage of revenues and profit will likely be smaller for larger banks with recently upgraded systems or that have moved to the cloud, but considerably larger for smaller firms with limited cost sharing structures. Across industries, Bain estimates that "many organizations will need to significantly increase cybersecurity spending, by up to two times their current levels or even more; planned increases of about 10% annually fall far short of what the threat now demands."[5] The overall cost will not just be in upgrading cybersecurity or hiring personnel. They will also need to patch or upgrade old systems and legacy technology, something that could pull resources away from new developments and revenue opportunities.

On the positive side, AI can be deployed by banks and other financial institutions to materially increase the speed at which software vulnerabilities and breaches are identified. However, these models do not provide ready-to-use remediation solutions, leaving banks to manage the complexity and execution risk of implementing fixes without disrupting interconnected IT systems. Institutions with more modern architectures and faster development cycles are therefore better positioned to adapt to the risks and opportunities presented by Mythos.

Furthermore, while the new AI models have accelerated the ability to discover software vulnerabilities, discovery alone does not equate to immediate exploitation. A hacker would still need to identify a viable attack path, gain the necessary access and successfully exploit the vulnerability. The gap between discovery and exploitation gives well-prepared defenders a critical window to act, reinforcing the value of rapid patching and layered security architectures.

The most durable approach to reducing software vulnerability risk is secure-by-design software development. This treats security as a core design requirement from the outset rather than a control added later in the development process. AI tools are increasingly supporting this shift by reviewing code changes for security flaws as they are introduced and suggesting safer alternatives aligned with best practices. Banks have a long track record of managing successive waves of technology-driven operational risk, and AI governance is advancing. Some 94% of respondents in our cyber survey said they had established formal AI usage policies.

Cyber risk is not an issue any single bank can address in isolation. Collaboration and information-sharing are central to how banks mitigate AI-driven cyber risk. Our survey reinforces this: 92% of banks participate in industry threat information-sharing groups, and 94% maintain service-level agreements with critical vendors requiring prompt notification of incidents or vulnerabilities.

Legacy architecture is the primary weakness

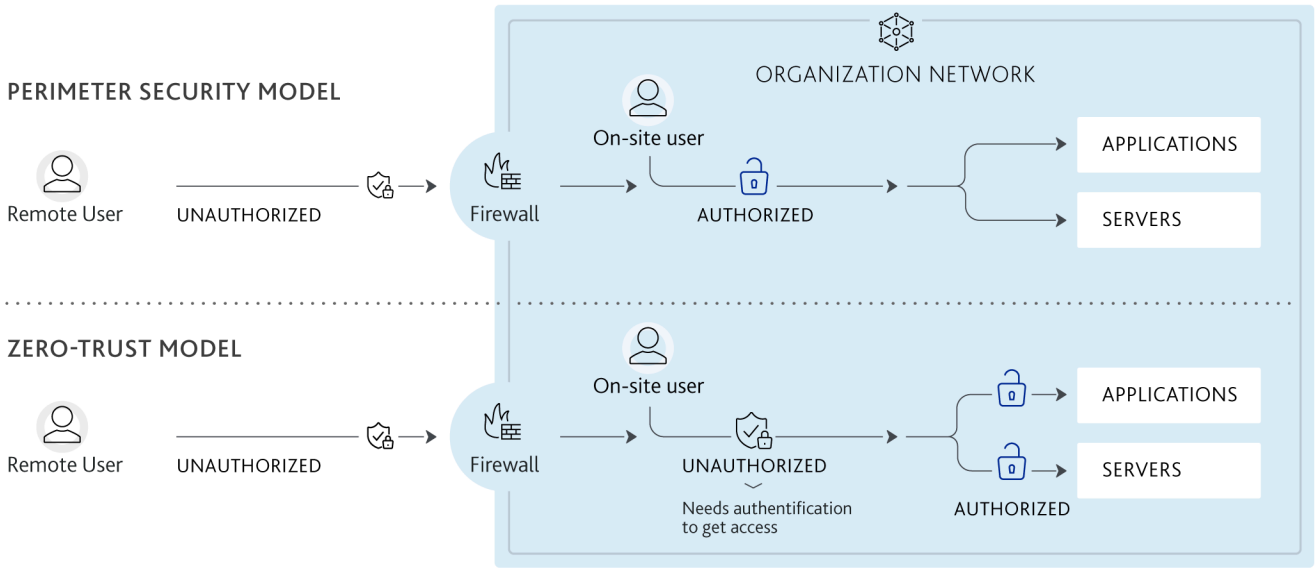
The capabilities of the new AI models will require banks and their cyber defense suppliers to work fast. Banks hold vast amounts of customer funds, maintain critical payments infrastructure and operate complex IT systems. While no single AI-driven software vulnerability discovery is likely to bring a bank down on its own, the cumulative effect of accelerating discovery-and-exploitation timelines raises the bar for remediation speed. A severe ransomware attack that disrupts services for an extended period could erode confidence and liquidity, underscoring the importance of proactive defense. As Mythos and models with similar or greater capabilities become more broadly available — as they almost certainly will — the pressure on remediation timelines will intensify. Static defenses requiring manual human input or monitoring that were used in the past are now likely to be insufficient.

Legacy IT infrastructure remains a key vulnerability for many financial institutions, with core banking systems in some cases dating back several decades. These environments are often complex and less adaptable, limiting the speed of upgrades, patching and incident response. While long operating histories are generally associated with stability, legacy systems may reduce resilience in the face of rapidly evolving AI-driven threats, increasing exposure to cyber risk.

Large networks of third-party vendors or software providers are another vulnerability. Almost every bank and financial institution uses third-party software, which offers another avenue for cyber perpetrators to enter a financial institution and cause disruption. Shrinking the footprint across vendors could help since a larger number of them increases the potential attack pathways.

In the new AI world, patching and security maintenance will need to be continuous. Periodic manual review by humans will likely be insufficient. Fortunately, banks are not staying idle - they have various monitoring exercises and put in control enhancements. For instance, Zero Trust architecture, which authenticates, authorizes and validates every access request, will be key to limiting the maneuverability of malicious actors once they breach corporate IT systems (see exhibit below):

Exhibit 2
Zero Trust vs Traditional Perimeter Security Model



Source: Moody's Ratings

Moody's related publications

» Risks posed by unpatched software flaws vary by industry and region, 1 April 2026

» AI is uncovering software bugs faster than firms can patch them, 18 March 2026

» Gaps in recovery capabilities increase vulnerability to a major cyber breach, 10 December 2025

» Cybersecurity - North American financial institutions often at forefront; subset lags, 13 November 2025

» Cybersecurity spending is growing as digital threats evolve, 25 September 2025

Endnotes

1 https://www.nytimes.com/2026/05/04/technology/trump-ai-models.html?unlocked_article_code=1.gFA.56BW.G1Zok7tY0YO3&smid=url-share

2 https://www.bain.com/insights/claude-mythos-and-ai-cybersecurity-wake-up-call/

3 https://services.google.com/fh/files/misc/m-trends-2025-en.pdf

4 Representing $46 trillion in aggregate assets

5 https://www.bain.com/insights/claude-mythos-and-ai-cybersecurity-wake-up-call/

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