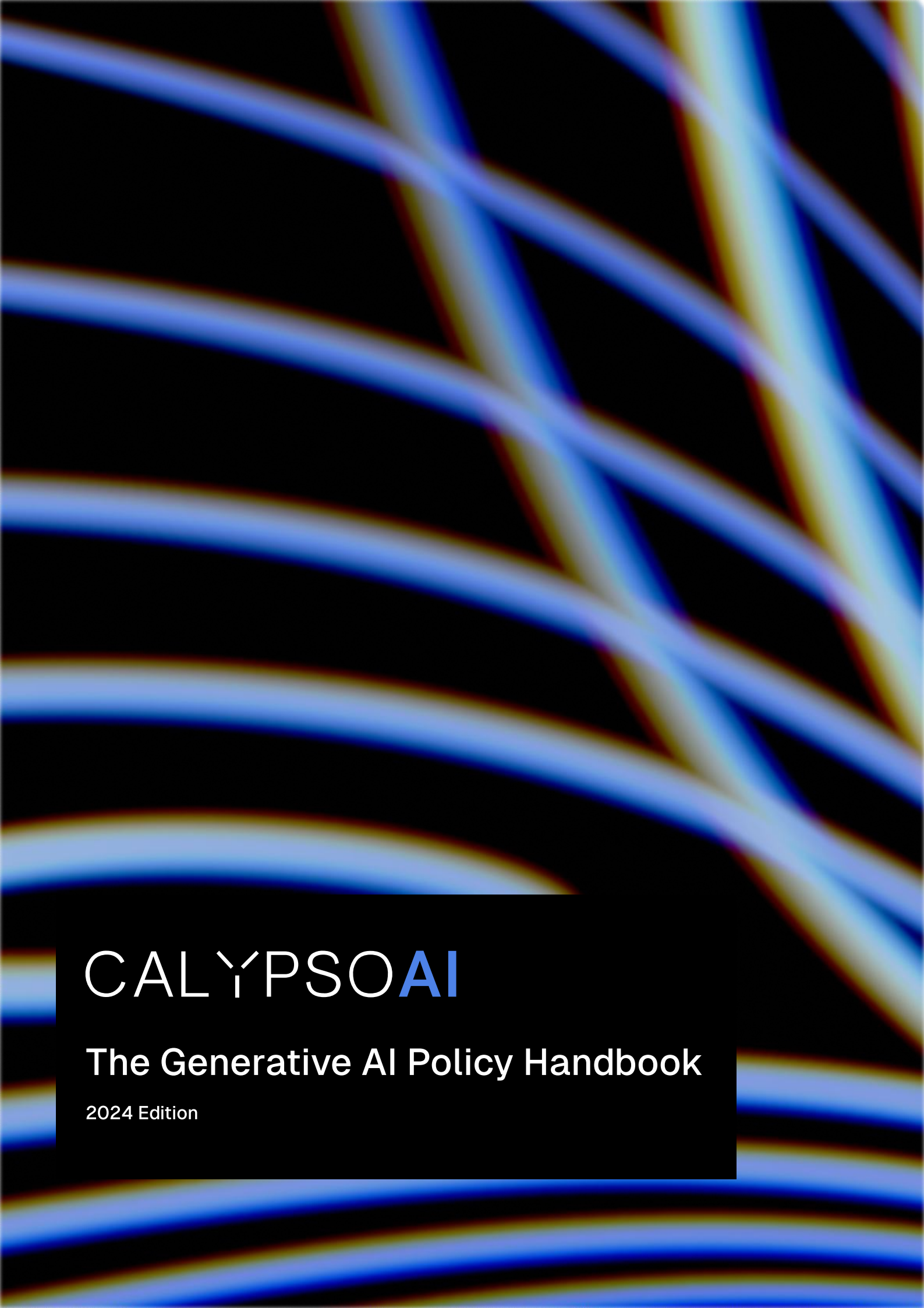
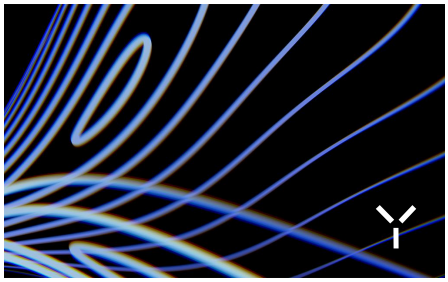


CALYPSOAI

The Generative AI Policy Handbook

2024 Edition



Introduction

Organizational adoption of and reliance on artificial intelligence (AI) tools has grown faster than anyone could have predicted. Since the debut of ChatGPT in November 2022, large language models (LLMs) have been shown to improve productivity and enhance efficiency by streamlining labor-intensive processes and boosting innovation, creativity, and output. An S&P Global survey of 1,500 decision-makers at large companies found that 69% have at least one AI/ML project in production with 28% having reached enterprise scale with the project "widely implemented and driving significant business value;" 31% have projects in pilot or proof of concept (POC) stages.

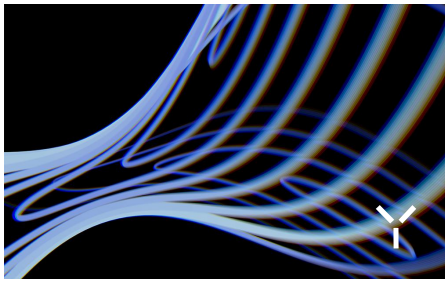
At CalypsoAI, through our PoC programs, an extended Lighthouse program, and ongoing customer engagements, we've helped multinationals across insurance, publishing, finance, real estate, and other sectors refine their thinking around use of generative AI (GenAI). These experiences have allowed us to distill the operational mindset of large organizations considering deploying GenAI models across their enterprise into three distinct tracks:

The Die-Hards:
They're going to block it until they know a lot more about it.

The Vanguards:
They're establishing proactive deployment plans for adoption.

The Caught Off-Guards:
Employee usage is driving use; deployment plans are TBD.

We have coalesced these intensive and ongoing conversations and observations into this concise guide to help your organization—whichever track it's on—to safely, securely deploy GenAI models.



Overview

The enthusiastic adoption of GenAI technology and its impact on the enterprise took the business world by surprise, but the risks accompanying the technology should not have. Security-conscious organizations have for years routinely prohibited connecting external or portable devices to company devices and monitored outbound emails for content or attachments considered proprietary, sensitive, or otherwise controlled information. When LLMs were released to the market for general use, however, they were immediately adopted by many large companies without any such safeguards in place, meaning a user—your employee—could include a sensitive document, confidential information, or source code in any query sent to the model.

While many early-adopter companies very quickly banned LLMs from their workplace—such as JPMorgan Chase, Apple, Samsung, and Bank of America, to name just a few—and the model providers rushed to release updated versions that included basic guardrails, the situation remained quite unstable. Nearly 18 months later, security issues and concerns continue to plague organizations that want to deploy GenAI solutions. At this point, hesitating to adopt tools like ChatGPT or Gemini from being used in your organization is like standing on the beach and trying to stop the tide. It's futile, unproductive, and a bit absurd.

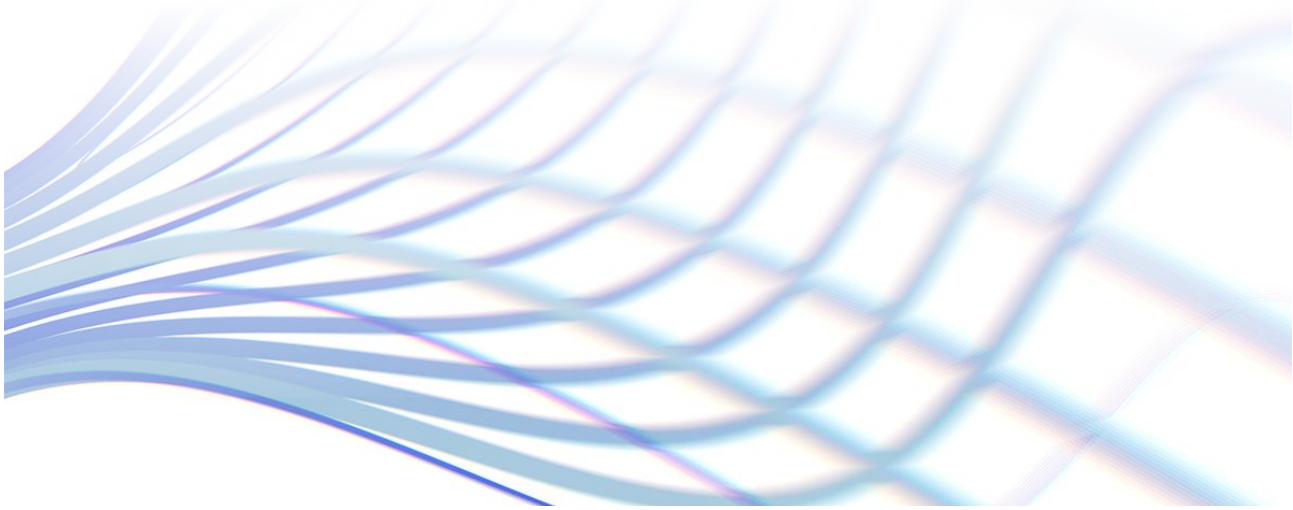
If the dangers of misuse by an employee weren't enough to keep security professionals up at night, the very introduction of GenAI models across an organization can have its own additive effect by contributing to "digital sprawl" or, even worse, "shadow AI." The former phenomenon occurs when discrete tools and solutions, including Software as a Solution (SaaS), external base, and Retrieval-Augmented Generation (RAG) models that are integrated with models, proliferate across an organization's digital infrastructure, but don't integrate effectively or at all. The latter is the presence of AI-dependent tools active on the system without the authorization or even the knowledge of the digital security teams.

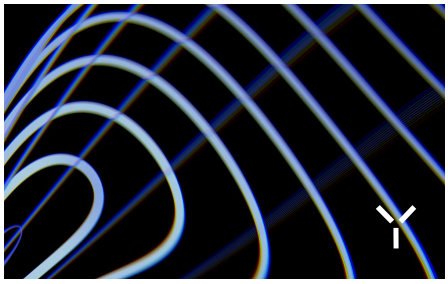
This type of misalignment causes a slow, but significant, expansion of the organization's attack surface that increases risk, especially when the new additions have not been vetted for security or compliance alignment. Having a solid, fact-based understanding of where your organization is on the AI security preparedness spectrum is the first step toward creating AI system security, which includes having observability built in across your deployment and use of GenAI.

As when integrating any other new tool into an existing system, deploying GenAI solutions requires due diligence and planning, beginning with a governance framework that functions as a blueprint for continual evolution of risk management across an AI-dependent attack surface, as well as a proactive means of establishing and maintaining compliance with organizational and industry values and external regulatory obligations. The underpinning of such a framework must include operational and strategic considerations.

But the very first step is gathering a cross-functional, in-house team of stakeholders and users from every level that will be affected by the use of GenAI models to establish a hierarchy of technical and operational needs, and use that as the basis for a governance framework.

Deploying GenAI solutions requires due diligence and planning.





Risk Exposure

As organizations begin to deploy GenAI models across their enterprise and realize the operational benefits, they will expand the implementation of or the number of models they're using, or both. Meanwhile, organizations that aren't using GenAI models yet will be as soon as they see competitors streamline processes and race ahead, thanks to productivity gains and cost reductions.

49%
of the general population uses GenAI, and more than one-third use it daily

64%
of non-users say they would use GenAI if it were safe/ secure

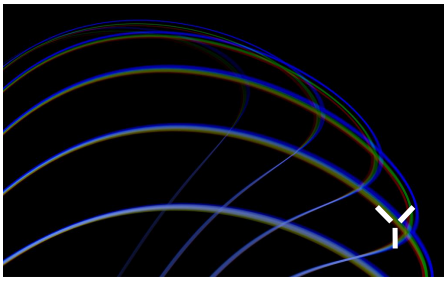
50%
of the general population has never used GenAI

52%
of AI users are increasing their usage

Source: Salesforce

While it's a given that any organization of any size and in any industry faces expanded risk exposure when it introduces a component to its networks or other systems, the addition of GenAI models dramatically increases the scope of that exposure, for example:

- Code with security vulnerabilities via model responses from LLM copilots, such as GitHub, CoPilot, or Amazon CodeWhisperer
- Reliance on multiple models that don't have strong security controls
- Incorporation of multimodal into models, such as voice-to-image, voice-to-text, voice-to-video, and text-to-image interactions
- Prompt injection/jailbreak attacks that direct the model to behave in ways detrimental to the organization's interests, values, or operations
- Risks to the digital infrastructure, such as infiltration via malware or spyware and data exfiltration via prompts or system breaches
- The creation, dissemination, or acceptance of deepfakes
- Unintentional use of copyrighted material/intellectual property (IP) provided by the model



Operational Controls

Even when carefully and thoughtfully deployed across an organization, GenAI model use will take on a life of its own, expanding rapidly as:

Executives and managers become more dependent on and accustomed to the financial benefits these tools deliver.

Employees, contractors, partners, and customers become more comfortable using the tools for streamlining productivity or communication.

New use cases are identified across business units and fine-tuned, bespoke, or SaaS models are developed and deployed to address them.

While all of these evolutions are good for business, they must not be considered as “happy path” events. As noted earlier, the addition of new technologies, such as multiple LLMs or GenAI models, multimodal models, or AI agents, to an organization’s digital infrastructure, particularly without also integrating targeted security protocols, leads to technological sprawl and increased exposure to exploitation on many levels. Incorporating the following tasks into your organization’s GenAI governance plan will help identify vulnerabilities, determine necessary solutions, and ensure deployment goes smoothly.

Know Your Attack Surface

The first step in establishing a security plan is having a thorough understanding of where, how, and why your organization is deploying AI, including all of the access controls and internal permissioning conventions activated for the AI solutions that allow for it.

The audit must include everything on the infrastructure, such as LLMs embedded in SaaS applications and RAG models in use across your organization. Taking the time to assess and document the models in use—or "zombies" that are present but no longer being used—will provide a complete portrait of your organization's potential attack surface. This will enable your security personnel to identify the tools and protocols they must deploy to eliminate or fortify vulnerabilities. Conducting regular audits will help ensure currency and enable faster identification of AI tools that could represent future vulnerabilities.

Choose Which GenAI Solutions to Incorporate

The number of GenAI models available to organizations has proliferated at orders of magnitude since the launch of OpenAI's monolithic ChatGPT. Large rivals appeared almost overnight, such as Bard, now Gemini (Google), LLaMA (Meta), and Claude (Anthropic). Very shortly thereafter, LLMs tailored for specific industries appeared, such as BloombergGPT (finance), Harvey (law), and Med-PaLM2 (medicine). Private LLMs gained rapid popularity as organizations wanted to leverage the power and scope of the large foundation models, but include detailed, proprietary information in a sequestered environment not accessible to outsiders and have greater control over security, user behavior, and analytic derivatives.

New tools kept appearing as more and more companies realized the possibilities or just kept pushing boundaries. Most recently, a public/private capability emerging in the enterprise space is the integration of LLMs with plugins or integrated into SaaS applications, for instance, Slack, Salesforce, and Bloomberg, to enhance the customer experience on one hand and enable increased productivity by incorporating reinforcement learning from human feedback (RLHF) on the other. And, more recently, models have iterations tailored according to capability or compute needs, such as the Anthropic models Claude 3 Haiku, Claude 3 Sonnet, and Claude 3 Opus.

Although the options for which GenAI models to deploy and how best to do that keep expanding, the decision for each industry and each enterprise within an industry will be based on its own business use cases and how incorporating the models into the mix will solve for those. Some well-established, somewhat universal use cases include:

- Generating new text, images, videos, or sounds from prompts provided in the same or different format
- Creating detailed reports from raw data
- Devising new materials, designs, drugs, or other products
- Translating text or audio into different languages in real time
- Developing new protocols for treating diseases or other physical issues
- Using copilots to provide context-aware assistance for everything from managing emails to writing code

Establish a Governance Framework

After the technical architecture for hosting the models has been addressed and the model(s) have been selected, the plan for deploying and using the model(s) must be crafted. The simplicity or complexity of your framework must be decided by the governance team, and it must begin with the philosophical aspects of governance—policies and principles—and move to the practical—technical controls.

Alignment with core organizational principles and existing policies is key, although you should expect that some, if not many, might need updating, if not a complete revision. Behavioral guidelines and acceptable use standards are also important. In a nutshell, the framework must set both the organization's expectations and the users' expectations, and explain to users what the tools are for, what they are expected to do, and how they are to be used—and what constitutes misuse.

Alignment with core organizational principles and existing policies is key.

Issues that organizations must address via policies include:

- Prompt injection/jailbreak attempts (deliberate attempts to bypass internal controls to generate responses containing discriminatory, illegal, unethical, or harmful content, or to gain unauthorized access to information or systems)

- Prompts including sensitive, personal, confidential, or proprietary information, including IP, that would cause damage to the organization financially, reputationally, or another way, were it made public.
  - Any content in a prompt can become part of the model provider's user-accessible knowledge base and, subsequently, be used to train future iterations of the model, either of which could place it in a competitor's search results
  - "Benign" content in a prompt, such as meeting or event dates, could be misused in the future or aggregated to create a picture of private corporate plans or executive movements; this type of content could include calendars, summaries of emails or reports, outlines of meeting agendas, travel itineraries, or first drafts of policy, procedure, contractual, or other documentation
- Accountability and oversight mechanisms, including human verification of model-generated content to determine accuracy, timeliness, factualness, and relevance, as well as to identify plagiarism or copyrighted content used without the copyright holder's permission
- Usage monitoring and auditing, which can provide insight into organizational, group, or individual usage, cost, and other metrics
  - Some monitoring mechanisms enable tracking employee or customer engagement, and can discern their emotional state or involvement during the interaction or identify protected status related to disabilities or other privileged or private information, and might be prohibited by law
  - Whether, how, and for what purposes monitoring should occur
- Alignment to/support of company goals and core values, including how using the model will improve operations, company culture, productivity, efficiency, and revenue
- What happens when things go wrong

Educate Your Employees

No amount of frameworks, policies, and similar documentation will help an organization that does not share that information with its people. While training methodologies will vary according to organizational culture and practices, elements of the program that should be non-negotiable include:

Make it mandatory: Everyone in the company must take the training. No one gets a free pass.

Make it meaningful: Include actual use cases from the organization. Present the risks and business consequences realistically and seriously.

Make it memorable: Use the method that works best for the organization. Make it an on-going program, rather than a once-a-year effort, to ensure security remains top of mind.

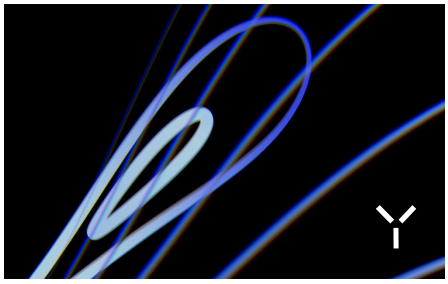
Encourage Feedback and Reporting

Such information can alert the governance team about issues left unaddressed, security teams about unforeseen or overlooked vulnerabilities, operations teams about additional use cases, and other teams about additional features or benefits that can be optimized. Establishing a channel for employees to share opinions about any element of the process or the models is critical to any roll-out. Ensuring the relevant teams take time to review and, if appropriate, act on the feedback is just as important.

Identify Consequences

We've known for decades that a single click or keystroke can create a security nightmare, a public relations disaster, or a financial calamity, or a combination of all three. The added layer that occurs when GenAI models are involved is that the content at the heart of the issue—such as a video or audio recording or a realistic email or photograph—could be completely fabricated. It no longer takes expertise to create deepfakes that are difficult to detect; bad actors with basic skills can use GenAI to create vocal reenactments of real people "saying" things they never said, to swap faces or have software manipulate faces to make it seem like people are saying or doing things they did not, and to do many other malicious acts.

The repercussions of having plausible, or even incredible, allegations made with "proof" that doesn't appear to be fake can be painful and expensive. Cyber and AI security professionals must plan to respond, rather than react, to the new and emerging destructive capabilities of these models, identify means of working to prevent their intrusion into the organization, and know what to do when intrusions occur.



Technical Controls

When the operational issues have been addressed, delving into the technical controls is going to seem like the easy part. Don't be fooled. This is an evolving area of concern as new security controls are devised and put in place, and then hacked or overridden by threat actors who live for the opportunity to take down anything that thwarts their livelihood. Let's look at this chronologically from the user's perspective.

Access Controls

Security-aware organizations have likely already implemented rigorous access controls, such as multi-factor authentication (MFA) and zero trust, for their AI-dependent systems. These controls are strong but they have their limitations, particularly when the protocol in place allows any user who gains access to the system to also have access to all applications. Segmenting systems, in which certain applications are set apart and require additional steps or permissions to gain access, is one strong solution to the "everyone everywhere" situation. However, deploying tools that feature built-in policy-based access controls (PBAC) is another, even stronger security solution, especially for situations in which organizations use multiple models across the enterprise.

CalypsoAI's groundbreaking SaaS-driven security, enablement, and model orchestration solution applies a "wraparound" trust layer that encompasses all GenAI models used in an organization, while providing administrators the ability to establish access for each user, as well as for groups of users. The clean, simple interface allows users to interact fully with the model or models available to them, while providing no visibility into the models or features to which they do not have access. In addition to providing secure permissioning, our PBAC feature is integrated with the solution's tracking and auditing capabilities to provide administrators full visibility into cost, content, and overall user engagement, and enables rate limits.

When operational controls have been addressed, technical controls will seem like the easy part. Don't be fooled.

Prompt and Response Scanning

After a user is authenticated and using the models, the models' inherent vulnerabilities don't disappear, but they do become more challenging to thwart. The following scenarios show the importance of scanning both outgoing queries and incoming responses for any content that could exploit a vulnerability, invite a threat, or otherwise put the organization at risk.

- An executive assistant submits a request to the model to condense voluminous meeting notes into concise meeting minutes, and the notes include the name of a company targeted for an acquisition and their boss' cell phone number. While the EA saved time crafting the minutes, everything in the request—the meeting topic, attendees, agenda, decisions, and the personal and confidential information—went outside the company's system and into the model provider's knowledge base, and potentially into the training data for Model 2.0. If that happens, competitors, threat actors, and everyone else using the right search terms will have access to all of it.
- A software developer under deadline to create complex code for the organization's new, groundbreaking product pastes some problematic command lines into a prompt and instructs the model to identify and resolve the issues. As in the previous scenario, the proprietary information leaves the organization and becomes part of the model provider's knowledge base, but the risks don't stop there. The developer, upon receiving the model's newly generated code in seconds, doesn't review or test it before uploading it to the company's code library. When the next build is compiled, the possible outcomes are:
  - The model-generated code is fine and works perfectly.
  - The model-generated code is glitchy or otherwise of poor quality, and causes issues downstream.
  - The model-generated code contains unnoticed vulnerabilities or malicious instructions and infects the library, the product, and possibly the system on which the code is running.
- A bored employee deliberately crafts queries that return responses containing discriminatory, biased, or other content outside of the acceptable use policy. The queries' content, now part of the provider's knowledge base, is associated with the organization from which the prompt originated and could be seen by future users, potentially creating reputational damage.

All of these instances point to a real need for technical controls on outgoing content. Tools that scan queries for recognized terminology (RegEx) that is inappropriate in most workplaces, for source code, or for sensitive, private, or personal data are critical. But cleverly (or cluelessly) written queries with no ill intent could generate responses containing content that would never be approved for use in the organization, such as malicious source code or discriminatory or other toxic material, which means incoming content must be scanned, as well.

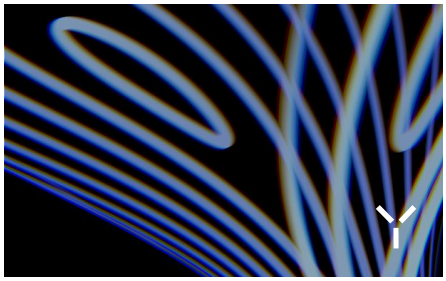
CalypsoAI's security solution solves for all of these issues by ensuring all user queries and model responses are reviewed by robust, automated scanners applying customized, administrator-defined criteria. The scanners identify source code, sensitive and personal data, toxicity, bias, and other content misaligned with the organization's acceptable use policy and other values, and prevents queries containing them from being submitted to the model without revision. Our solution also scans incoming responses for malicious code and other administrator-identified content, and provides the option to require human verification of any or all content returned by the model.

Observability

Few models provide features that enable visibility into model usage or other metrics. Given the costs of using GenAI models, understanding who is using the model(s), how often, and for what purposes can help with resource allocation; knowing which users are routinely flagged for including inappropriate or otherwise prohibited language or content in prompts, or making requests for inappropriate or prohibited content to be returned in a response, could initiate HR involvement. Insights into user sentiment can also be valuable, where allowed.

Model-agnostic and scalable across the enterprise, CalypsoAI is the first solution to provide a safe, secure research environment and fine-grained content insights with no effect on response speed. With the capability to provide coverage for all LLMs in use, it provides end-to-end observability for user engagements. Chat histories are fully tracked for usage, content, and cost, are fully auditable, and can be purged manually or on a pre-set cadence, if required by policy or regulation.

Administrator actions are also logged and available for review, enabling 360-degree visibility and accountability across the enterprise.



Conclusion

The list of possible worst-case scenarios induced by incorporating multiple and multimodal GenAI models across an organization could go on and on. Candidly, if a human can think it, a human will try it. But, by default or maybe by inclination, cyber and AI security professionals know bringing GenAI models in house represents a challenge and an opportunity to say Yes! to deploying GenAI, not a reason to say No, never!

Only the organization using a model can determine how it should and should not be used or when it should and should not be used; every organization has different needs and different goals. Developing a governance framework that identifies those needs and goals, and lays out a roadmap for meeting them using the capabilities LLMs can provide, is critical to achieving those results.

Vulnerabilities, both in the model itself and those initiated by the inclusion of the model into the organization's digital infrastructure, must also be identified and addressed. Few model providers have integrated strong security tools into their models, but external solutions, such as CalypsoAI, exist to cover the scope of issues that such models and their inherent vulnerabilities present.

Providing protection at scale without creating or exacerbating latency, privacy, or security issues is achievable, which can enable your organization to deploy GenAI models safely, securely, effectively, and efficiently in real time. CalypsoAI can provide the peace of mind that decision-makers need to greenlight the safe, secure, ethical use of GenAI across the enterprise.

CalypsoAI is the leader in developing and delivering AI security and enablement solutions. The company's vision is to be the trusted partner and global leader in the AI security domain, empowering enterprises and governments to leverage the immense potential of GenAI solutions and LLMs responsibly and securely.

CalypsoAI is striving to shape a future in which technology and security coalesce to transform how businesses operate and contribute to a better world. Founded in Silicon Valley in 2018 by top minds in the fields of artificial intelligence, data science, and machine learning, the company has secured backing from investors including Paladin Capital Group, Lockheed Martin Ventures, Lightspeed Venture Partners, 8VC, and Hakluyt Capital.

To learn more, visit our website or follow CalypsoAI on X and LinkedIn.

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