



Deploying trustworthy AI: An Illustrative Risk and Controls Guide

The guide to AI risks and underlying control considerations for risk, technology, compliance, and legal leaders

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Foreword

AI is on the rise. Controls can help manage the risks.

Artificial intelligence (AI) is revolutionizing sectors, transforming business structures, and even altering our way of life and work. It also holds the potential to significantly reshape the future of your organization.

The accomplishments enterprises can achieve with AI are seemingly limitless. According to the KPMG 2024 US CEO Outlook, 68 percent of CEOs say AI is a top investment priority, despite uncertain economic conditions with top expected benefits being increased efficiency and productivity, an upskilled workforce, and increased enterprise innovation.¹

Unsurprisingly, such benefits make executives eager to integrate AI into their businesses and accelerate the value it delivers. **But organizations can only harness AI's full potential once they ground such initiatives in trust, managing its complexities and risks in a responsible, ethical, and transparent manner.** As the scale and complexity of AI adoption advances across business operations, such complexities become increasingly difficult to navigate.

The stakes are also rising for those tasked with ensuring the safe deployment and use of AI applications—risk and compliance departments, cyber and information security teams, data and privacy offices, legal teams, and internal audit. AI systems that are not properly governed and controlled can hinder returns on AI investments, lead to regulatory compliance violations, result in data and IP loss, or damage the organization's reputation.

Ultimately, it will be key to ground AI systems in pragmatic and scalable risk management practices to **deploy AI boldly, quickly, and responsibly—unlocking its transformative benefits.** Establishing a robust risk and controls guide for managing AI risks is a critical step in developing an AI risk management program.

KPMG has published a first-of-its kind illustrative AI risk and controls consideration guide. The guide—aligned to the KPMG Trusted AI framework—provides a structured approach for organizations to begin identifying AI risks and designing proportionate control considerations to mitigate those risks. While existing AI frameworks and standards identify risks at different stages of the AI lifecycle, this guide delves into the underlying control

activities, outlining suggestive control considerations businesses should contemplate for managing AI risks.

Please note: This guide is meant to be an informative aid for helping organizations like yours appropriately manage AI-specific risks. It provides illustrative examples of potential control considerations to address a large, though not complete, set of AI-specific risks. Intentionally focused solely on AI risks, it is designed to complement existing risk management frameworks that address general technology risks across domains such as security, data privacy, and third-party risk management. As such, you should first identify control considerations from this guide that are relevant to your business, and then carefully integrate them with your existing risk and control frameworks to help ensure a thorough view of risks across your organization.

We hope that this guide helps your organization begin to navigate the complex landscape of AI risks and drive innovation in a trusted manner.

—Bryan McGowan
Global and US Trusted AI Leader, KPMG LLP

¹ KPMG 2024 US CEO Outlook



How to put this guide into practice

Who is this guide for?

This guide can serve as a resource for any businessperson leading or involved in AI risk management and governance, including risk and compliance departments, cyber and information security teams, data and privacy offices, legal teams, and internal audit.

Start with these questions.

How does the risk and related set of control considerations align to existing risk taxonomies in my business?

This guide is aligned to the 10 pillars of the KPMG Trusted AI framework, and was developed around leading AI frameworks and regulations, such as ISO 42001, the National Institute of Standards and Technology (NIST) AI risk management framework, and the EU AI Act. This is meant to be complementary to existing risk taxonomies within your organization, such as IT general controls and data governance controls.

How should the control considerations be applied across the AI lifecycle?

To identify and implement control considerations across the AI lifecycle, there are several factors organizations

should consider, such as understanding the nature and use of the AI system; data flow, configuration, and logic that influences operation; and learning types and data sources used.

How can we design and implement the control considerations to fit our own organization and AI system?

Not every organization or AI system may need to implement every control or there may be additional controls based on your specific deployments. Users of this guide should consider existing risk and control taxonomies in place and relevant to AI, such as IT general controls, data governance controls, access and security controls, application programming interface (API) controls, etc. Additionally, users should consider, for example, the nature of the AI deployments, and whether AI systems are third party, internally developed, leverage proprietary data sources, or have other configuration or techniques in play (such as retrieval augmented generation) which may influence risks and AI system operation. These considerations help to inform what risks may be present and, therefore, control activities required.

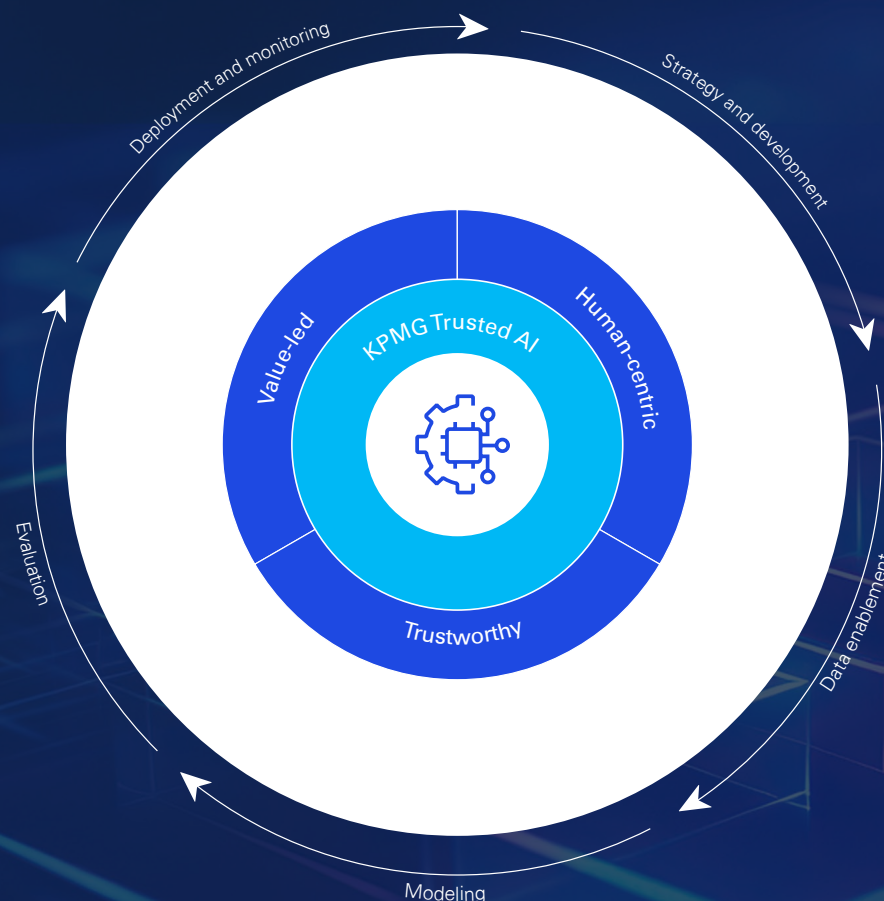


Trusted AI Pillars of Risk and Controls Guide

About the KPMG Trusted AI framework

The AI Risk and Controls Guide is aligned to our [Trusted AI framework](#), which is rooted in a values-driven, human-centric, and trustworthy approach to AI development and deployment. The Trusted AI framework helps our own firm, and our clients, develop and deploy AI solutions that address ethical concerns and comply with regulatory standards.

Organized under the 10 pillars of the KPMG Trusted AI framework, this guide outlines an initial inventory of AI risks, each with a set of control considerations that organizations can leverage as they build out their control catalogues.





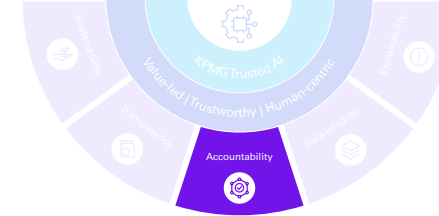
Accountability

10 pillars of the Trusted AI framework

Human oversight and responsibility should be embedded across the AI lifecycle to manage risk and comply with applicable laws and regulations.



Click each pillar
below to explore





Data Integrity

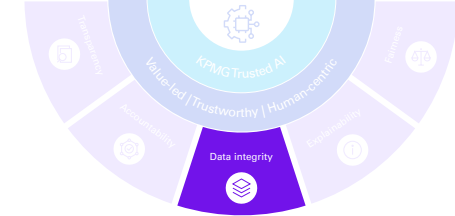
10 pillars of the Trusted AI framework



Click each pillar below to explore

Data used in AI solutions should be acquired in compliance with applicable laws and regulations and assessed for accuracy, completeness, appropriateness, and quality to drive trusted decisions.

Risk Category	Risk Consideration	Risk Description	Illustrative Control Considerations
Lack of Data Integrity in AI Systems	Insufficient data governance	Lack of adequate data governance over learning, training, or testing data may lead to biased, inaccurate, or unreliable outputs and ineffective AI systems.	<p>Policies and procedures define data management requirements, including the collection, analysis, labelling, storage, and filtration of data as well as decision-making criteria for using training and test data sets to ensure compliance with regulatory requirements and organization values. Training and awareness campaigns are performed for relevant stakeholders to enforce compliance. The policies and procedures are reviewed and updated, as needed, periodically.</p> <p>Perform quality checks and comprehensive measures, such as data gap analysis, to ensure the quality, accuracy, and completeness of training, validation, and testing data. Any discrepancies or shortcomings are promptly identified, documented, and addressed.</p>
	Inadequate methods to facilitate and control data interactions	Lack of appropriate methods to facilitate and control data interactions (e.g., transfers) between the AI systems and data sources or other entities (e.g., applications, APIs) may result in data corruption or loss, system misuse, or inappropriate access.	<p>During the change management process for an AI system, the training and testing data used is evaluated for relevancy and accuracy with the change. As needed, additional data is introduced to train and test new system capabilities or features.</p>





Explainability

10 pillars of the Trusted AI framework

AI solutions should be developed and delivered in a way that answers the questions of how and why a conclusion was drawn from the solution.



Click each pillar below to explore





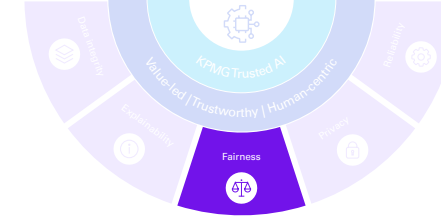
Fairness

10 pillars of the Trusted AI framework



Click each pillar
below to explore

AI solutions should be designed to reduce or eliminate bias against individuals, communities, and groups.





Privacy

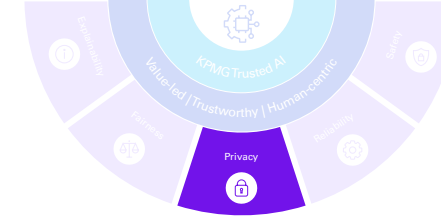
10 pillars of the Trusted AI framework



Click each pillar below to explore

AI solutions should be designed to comply with applicable privacy and data protection laws and regulations.

Risk Category	Risk Consideration	Risk Description	Illustrative Control Considerations
Privacy Violations from AI Solutions	Data subject access privacy	Lack of operational infrastructure to enable individuals to exercise their data subject access rights timely may result in a loss of consumer trust, regulatory noncompliance, or cause financial harm.	Launch awareness programs aimed at educating data subjects about their rights in relation to AI technologies, and explaining how to exercise these rights and the implications of AI decision-making on their personal data.
	Privacy directives and regulatory noncompliance	Lack of compliance and alignment with organization directives and/or regulations on processing data subjects may lead to financial penalties, market losses, and reputational damage.	Reviews are periodically conducted over the input, training data, and output utilized by AI solutions to ensure that the use of data remains in compliance with the organization's data privacy directives and relevant regulatory requirements.
			Monitor and assess AI system purpose changes, ensuring any new personal data use is fair, lawful, and transparent.
	Privacy violation due to data breach	Potential data breaches may result in the unauthorized access or disclosure of personal, official use, confidential, and strictly confidential data, which could compromise user or organization privacy, violate data protection laws, lead to reputational damage, or cause financial harm.	A robust oversight system is implemented, including ethical reviews, regular audits over data protection measures, impact assessments, and compliance checks, particularly when the use of sensitive personal data for AI training or production is undertaken.
			Document rationale and explicit approval when obtaining data for training. Special precautions are implemented for AI use cases that may directly or indirectly affect vulnerable individuals or have safety or rights implications.
			To a degree appropriate for the model and use case, a controlled amount of randomness (i.e., differential privacy) is added to training and prompt data to protect data privacy.





Reliability

10 pillars of the Trusted AI framework

AI solutions should consistently operate in accordance with their intended purpose and scope and at the desired level of precision.



Click each pillar
below to explore





Safety

10 pillars of the Trusted AI framework



Click each pillar below to explore

AI solutions should be designed and implemented to safeguard against harm to people, businesses, and property.

Risk Category	Risk Consideration	Risk Description	Illustrative Control Considerations
Inadequate Response to AI-Generated Safety Threats	AI system errors are improperly resolved	Errors in the AI system remain undetected, detected late, or not acted upon timely, resulting in unauthorized changes, system unavailability, security breaches, data loss, or other incidents.	<p>A subset of AI-only threat response decisions is periodically reviewed to ensure that decisions are ethical, responsible, and aligned with business objectives. The review is performed by authorized persons within the organization and review documents are retained.</p> <p>Anomaly detection systems are implemented to detect suspicious activities (e.g., prompt injection, data poisoning, abuse, evasion, or privacy attacks; increased traffic in a communication channel; and indirect prompt injection) within a system.</p>
	Generation of harmful or unreliable content (e.g., hallucinations)	Generative AI outputs may be harmful, offensive, biased, or misleading and could negatively impact the organization, communities, or society.	Feedback loops within the AI System are implemented to continuously validate and verify system outputs to ensure that the AI is not generating content (including hallucinations) that is harmful; inaccurate; or deviates from intended use, business objectives, or defined parameters.
Threat to Humans	Lack of human intervention	Human unawareness of AI use and lack of proper oversight may result in the inability to override and/or correct decisions made by AI systems.	Develop approved policies and procedures to disclose AI-generated or manipulated content (e.g., deep fakes) that resembles existing persons, objects, places, or events. Ensure training and awareness to the relevant stakeholders to enforce compliance.
			Human moderators reply to reports of AI misuse or inaccurate outputs/decisions, ensuring the AI system's decisions are appropriately vetted and responded to. Any needed reversal in action is taken in a timely manner.



Security

10 pillars of the Trusted AI framework

Robust and resilient practices should be implemented to safeguard AI solutions against bad actors, misinformation, or adverse events.



Click each pillar
below to explore





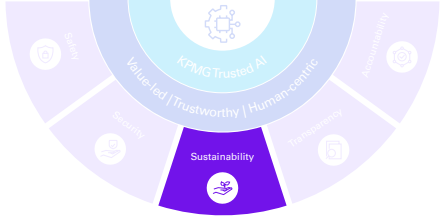
Sustainability

10 pillars of the Trusted AI framework

Click each pillar below to explore

AI solutions should be designed to be energy efficient, reduce carbon emissions, and support a cleaner environment.

Risk Category	Risk Consideration	Risk Description	Illustrative Control Considerations
Overarching Risk Associated with AI Sustainability	Failure to prioritize the sustainable development of AI systems	Environmental impact is not considered in AI system strategy and design, which may result in energy inefficient systems.	During AI Strategy and Development, establish clear sustainability goals for the AI system, aligned to the organization's standards, and develop a strategy for demonstrating how the AI system will meet the goals throughout its lifecycle.
	Failure to prioritize the sustainable implementation and use of AI systems	Lack of sustainable implementation, use, and monitoring practices may result in system sustainability degradation and misalignment with organizational ESG commitments.	Incorporate environmental impact indicators and real-time monitoring mechanisms across the AI system lifecycle to ensure energy consumption, system efficiency, and emissions adhere to applicable environmental standards and company strategies. Gaps or improvement areas identified are quickly remediated.





Transparency

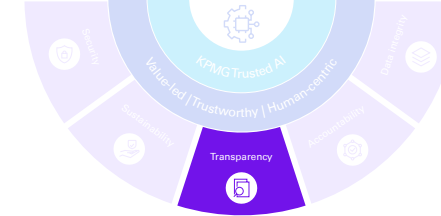
10 pillars of the Trusted AI framework



Click each pillar below to explore

AI solutions should include responsible disclosure to provide stakeholders with a clear understanding of what is happening in each solution across the AI lifecycle.

Risk Category	Risk Consideration	Risk Description	Illustrative Control Considerations
Distinguishing Human vs. AI Content	Opacity of AI systems	Lack of AI system transparency can reduce accountability, raise ethical concerns, and erode consumer trust.	Demonstrate the AI system's validity and reliability, and document the limitations of its generalizability beyond the tested conditions to ensure transparency about its applicability and effectiveness.
			Identify and document potential negative residual risks to both downstream acquirers and end users, to provide a comprehensive overview of unmitigated risks associated with the AI system.
Lack of Transparency in AI and Data Usage	Lack of explainable AI solution environment	Lack of understanding of AI-related IT and data components by operational IT support can undermine the effectiveness of controls, including security, software licenses, IT operations, and business continuity.	Document test sets, metrics, and the tools used during the Test, Evaluation, Validation, and Verification (TEVV) processes to establish a transparent and reproducible framework for assessing the AI system's performance and reliability.
			AI-generated or manipulated content is labeled or watermarked (e.g., CP2A) to ensure transparency and lineage of AI created content.
	User transparency	Insufficient transparency in the development and use of AI systems may result in a lack of accountability, making it difficult to understand the rationale behind the system's behavior, raise ethical concerns, and erode consumer trust.	For each output generated by the AI system, users are explicitly informed of potential inaccuracies in the results, with a strong recommendation to critically review the AI system's outputs.
			Prior to each use, users of the AI system are notified of data collection and/or processing for personalization and recommendation purposes. When notified, users are presented the option to opt out of such services to ensure transparency and user choice.
			Users or those impacted by emotion recognition or biometric categorization AI systems are notified of the system's operation prior to their use.





Designing controls for your AI systems

The control considerations in this guide offer a foundation for creating tailored control descriptions for your AI deployments. We've also included a few example control implementation descriptions for inspiration to get you started. If you have any questions, do not hesitate to reach out to our team.

Pillar	Risk Category	Illustrative Control Consideration	Example Control Implementation Description
Accountability	AI Performance Erodes Over Time	Perform periodic assessments of the AI system's outputs to ensure they align with original business and ethical requirements. Any discrepancies are documented and addressed promptly to ensure the AI exhibits intended behavior and meets business objectives.	Quarterly, the AI system owner reviews a sample of the AI system's outputs against established key performance indicators (KPIs) and key risk indicators (KRIs) to ensure it is performing as expected. Any discrepancies or variances above established thresholds are investigated and resolved within 5 business days. If a major discrepancy is identified, the system is pulled back from production immediately.
Fairness	Harmful Bias in AI Systems	Training for all team members who create and develop AI systems is periodically conducted to ensure team members understand the diverse needs of different user groups and practical methods for implementing accessibility in AI.	Annually, all team members who create and develop AI systems are required to complete the "AI Fairness and Accessibility" training course. After completing the course, all team members are required to take a post-training assessment where a minimum score of 85% is required to pass.
Data Integrity	Lack of Data Integrity in AI Systems	During the change management process for an AI system, the training and testing data used is evaluated for relevancy and accuracy with the change. As needed, additional data is introduced to train and test new system capabilities or features.	When making a change to an AI system, perform regression or error rate testing as defined by the Change Management policy. Any issues identified during testing greater than "low" are resolved prior to deployment into production.
Transparency	Lack of Transparency in AI and Data Usage	For each output generated by the AI system, users are explicitly informed of potential inaccuracies in the results, with a strong recommendation to critically review the AI system's outputs.	For each output generated by the AI system, a disclaimer is included at the beginning of the generated text output, stating: "Outputs generated by this system may include inaccurate, incomplete, or out-of-date information. Consequently, they may not be relied on without applying professional judgement."
		Prior to each use, users of the AI system are notified of data collection and/or processing for personalization and recommendation purposes. When notified, users are presented the option to opt out of such services to ensure transparency and user choice.	Prior to each use of the AI system, an acknowledgement window stating, "I consent to the collection of my data through the use of this system," is displayed in the user interface, blocking access to use [System A]. Users are prevented from using the AI system unless they provide their consent by clicking "I acknowledge."



How KPMG can help

The KPMG Trusted AI framework offers a pathway to help harness AI's potential in a trusted manner, and our suite of AITrust services and solutions helps companies put the framework into action.

Our services include:

01

Trusted AI strategy: Assist organizations in assessing their current AI capabilities and crafting strategic roadmaps that enhance potential.

02

AI ethics and governance: Assist in the development of robust AI governance frameworks, controls, and operating models to help ensure AI is trustworthy. This includes comprehensive risk, policy, and controls assessments, alongside AI regulatory compliance.

03

AI risk assessment and regulatory compliance: Help organizations assess where they are in their Trusted AI journey by conducting risk-based AI assessments across AI use cases. This includes AI readiness, maturity assessments, AI strategy review, and assessing consistency of AI solutions with evolving frameworks and regulations.

04

Machine learning operations: Develop leading constructs, processes, and technologies for model management to help build trust in AI models, supporting their governance, lifecycle management, and effective deployment and monitoring.

05

AI security: Provide strategies, processes, and tools to help enhance AI security and privacy, helping organizations detect, respond to, and recover from cyber threats, privacy risks, and adversarial attacks.

06

AI assurance: Help test, examine, and report on the management processes, controls, and claims regarding the responsible use of AI technologies:

- AI assurance scoping
- AI diagnostics reviews
- AI model control testing

Need a customized AI Risk and Controls Guide?

KPMG can help customize and tailor the AI Risk and Controls Guide to meet the specific needs and challenges of your organization, provide targeted training and education to help ensure a deep understanding and effective application of the matrix's principles, and deliver ongoing support and advisory services to navigate emerging AI risks and opportunities. Specific services we offer that can help your team tangibly implement the framework include:

- **AI governance design and operations support:** establishing or enhancing your AI governance program, policy, and operating model, or helping to scale and operationalize your AI governance program
- **Regulatory mapping:** mapping to existing taxonomies to help ensure a complete control portfolio
- **Lifecycle mapping:** aligning controls that best fit to different stages of the AI lifecycle
- **Control implementation support:** documentation, design, and implementation support for AI controls
- **AI assessments:** conducting AI assessments, compliance assessments, or risk-based governance assessments

For more information: visit.kpmg.us/TrustedAIservices





Discover how we can help you along your Trusted AI journey.

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