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Artificial Intelligence Professional

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The AI Governance Illusion: Why ISO/IEC 42001 and CAIP Matter More Than Ever

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Educational Background

- Diplom-Informatiker (Computer Science) – Technical University of Berlin
- Doctor of natural sciences (Dr. rer. nat.) – Computer Science, Artificial Intelligence and Neurophysiology

Professional Qualifications (selection)

- Certified ISO27001 Lead Auditor and Auditor Instructor (PECB)
- ISO27002:2022 Senior Lead Manager (PECB)
- Certified Data Protection Officer (CDPO – EU GDPR, HWK & PECB)
- Certified Business Continuity Professional (CBCP, DRII)
- Certified Information Security Systems Professional (ISC2 - CISSP)
- ISO42001 Certified AI Management System Lead Implementer (PECB)

Specialist Competences (selection)

- ISM, IT and Cyber Security
- IT Governance, Risk and Compliance (GRC)
- EU Data Protection Regulation (EU GDPR)
- Strategic Risk Management, Analysis & Assessment
- Business Impact Analysis (BIA)
- IT Audit / IT Security Audit
- Business Continuity Management (BCM)
- Automotive Information Security (TISAX)
- Artificial Intelligence, Neural Networks

Overview

1. **From ISMS towards AIMS**
   – *how ISO42001 extends traditional ISO27001*
2. **Is AI a Risk or a Security Tool?**
   – *the dual impact of modern AI Systems*
3. **AI Governance under the EU AI Act**
   – *what auditors and CISOs must prepare for now*
4. **Is Standalone-ISO27001 still Sufficient?**
   – *AI requires more beyond traditional ISMS*
5. **Prompt Injection, Data Poisoning & Model Leakage**
   – *new attack classes against AI systems*
6. **Shadow AI in the Enterprise**
   – *the new art of Shadow-IT*
7. **How an AI system should Actually be Audited**
   – *new controls, competences and approaches*
8. **AI Supply Chain Risks**
   – *who is really-accountable for the AI model?*
9. **"AI Compliance-Theater"?**
   – *between real governance and marketing*
10. **Humans Remain the Biggest Risk**
    – *…even in the Age of AI*
11. **"Errare Mechanicum Est" – Non Solum Humanum**
    – *what happens when AI makes a Mistake*
12. **AI – employed in Auditing**
    – *will the auditor be replaced?*
13. **Agentic AI & Autonomous Systems**
    – *the next governance challenge?*
14. **The Myth of Confidentuiality in an AI Model**
    – *how to protect data residing inside of an AI model*
15. **Zero-Trust meets AI**
    – *security architectures for AI-native enterprises*

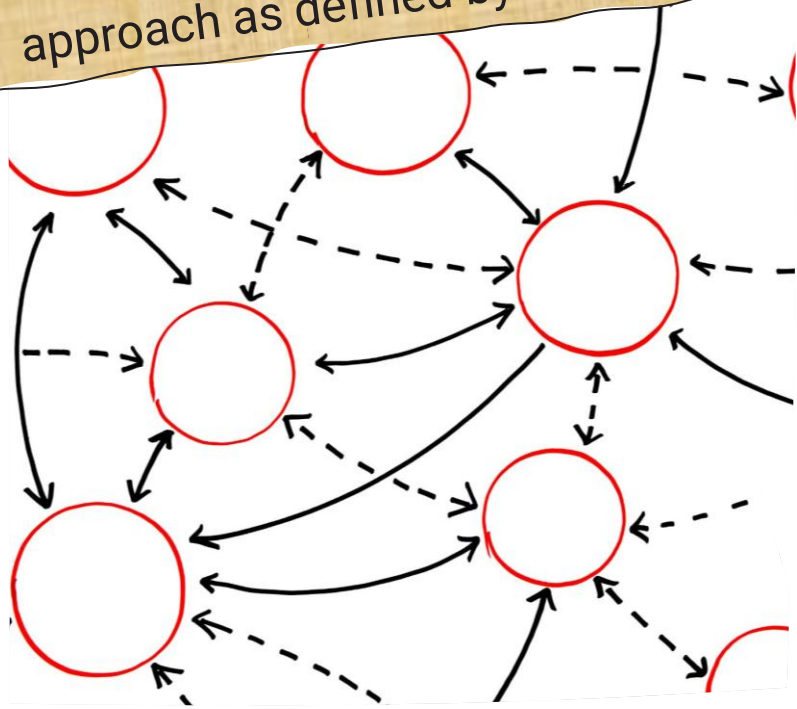
**ISO 42001 defines the framework –
CAIP enables the people to implement it.**

From ISO27001-based ISMS towards an ISO42001-based AIMS

How does ISO42001 extend the traditional ISO27001?

- **Scope Expansion**: From Information Assets to AI Systems & Lifecycle
  → data, models, training, deployment, monitoring
- **New Risk Dimensions Beyond Traditional Security**: From CIA to AI-Specific Risks
  → bias, explainability, robustness, unintended outcomes
- **Governance Extension**: From Security Controls to Ethical & Responsible AI
  → fairness, accountability, transparency, human oversight
- **Control Framework Enhancement**: New AI-Specific Controls & Processes
  → model validation, data governance, performance monitoring
- **Roles & Responsibilities**: Introduction of AI Accountability Structures
  → AI owners, model risk governance, cross-functional oversight
- **Lifecycle Integration**: From Static ISMS to Continuous AI Lifecycle Management
  → training–testing–deployment–retraining cycles
- **Regulatory Alignment**: Bridging ISO Standards with EU AI Act Requirements
  → risk classification, compliance evidence, auditability
- **From Security Compliance to Trustworthy AI**: From Information Security to AI Trustworthiness
  → reliability, safety, explainability as audit dimensions

Managing AI requires more than extending existing ISMS structures
– It demands a dedicated and lifecycle-oriented governance approach as defined by ISO 42001.



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Is AI a Risk or a Security Tool?

The Dual-Impact of Modern AI Systems

AI is not just a new risk or a new tool!
– It fundamentally breaks the traditional separation between attacker and defender, forcing organizations to rethink governance altogether.

- **AI as a Force Multiplier for Cyber Attacks**
  → *automation, phishing, deepfakes, vulnerability discovery*
- **AI as an Enabler for Advanced Defense Capabilities**
  → *SOC automation, anomaly detection, threat intelligence*
- **Generative AI in the Enterprise**: Productivity vs. Data Exposure
  → *prompt leakage, uncontrolled data flows*
- **New Attack Surfaces**: AI Models, Pipelines and APIs
  → *model exploitation, prompt injection, data poisoning*
- **AI-Augmented Decision Making**: Efficiency vs. Loss of Control
  → *overreliance, hallucinations, opaque decisions*
- **Dual-Use Dilemma**: The Same Technology for Offense and Defense
  → *attackers and defenders using identical capabilities*
- **Speed & Scale**: Acceleration of Both Risks and Responses
  → *real-time attacks vs. real-time detection*
- **Governance Challenge**: Managing Trade-offs Between Innovation and Security
  → *risk appetite, control frameworks, regulatory pressure*

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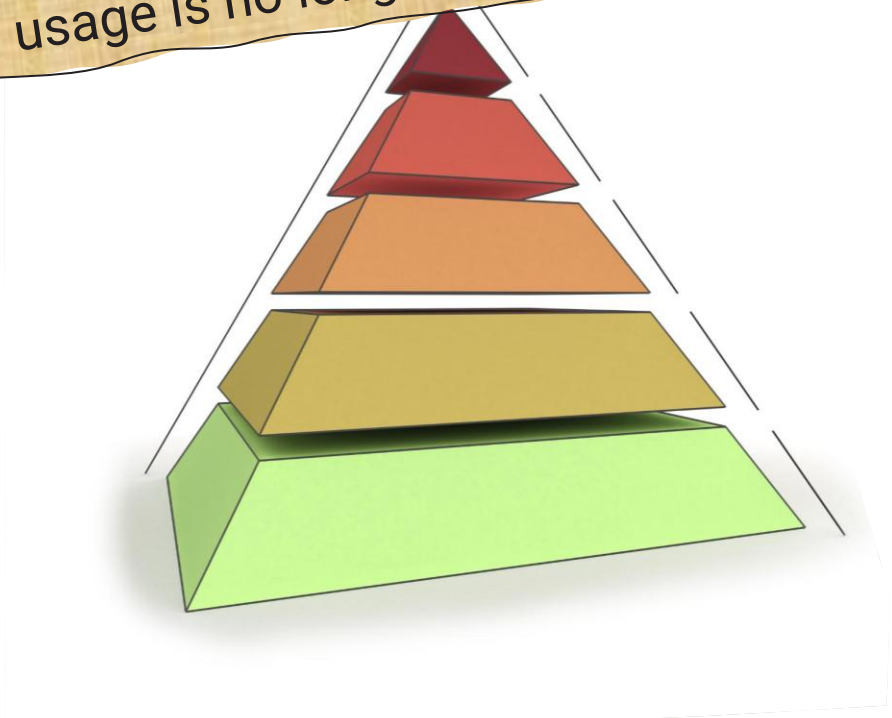
AI Governance under the EU AI Act

What do Auditors and CISOs must Prepare for Now?

- **Risk-Based Classification of AI Systems**
  → *prohibited, high-risk, limited-risk, minimal-risk*
- **Mandatory Requirements for High-Risk AI Systems**
  → *risk management, data governance, human oversight*
- **AI Governance & Accountability Structures**
  → *roles, responsibilities, three-lines-of-defense integration*
- **Documentation & Auditability Expectations**
  → *technical documentation, logging, traceability*
- **Continuous Monitoring & Post-Market Surveillance**
  → *performance tracking, incident reporting*
- **Integration with Existing Frameworks**: ISO 42001 / ISO 27001 / GDPR
  → *control alignment, governance synergies*
- **Third-Party & Supply Chain Obligations**
  → *provider vs. deployer roles, vendor risk, model transparency*
- **Enforcement, Liability & Regulatory Exposure**
  → *fines, accountability, reputational impact*

The EU AI Act transforms AI governance from a 'best practice' discussion into a regulatory obligation.
It creates the illusion of informal AI usage is no longer sustainable.



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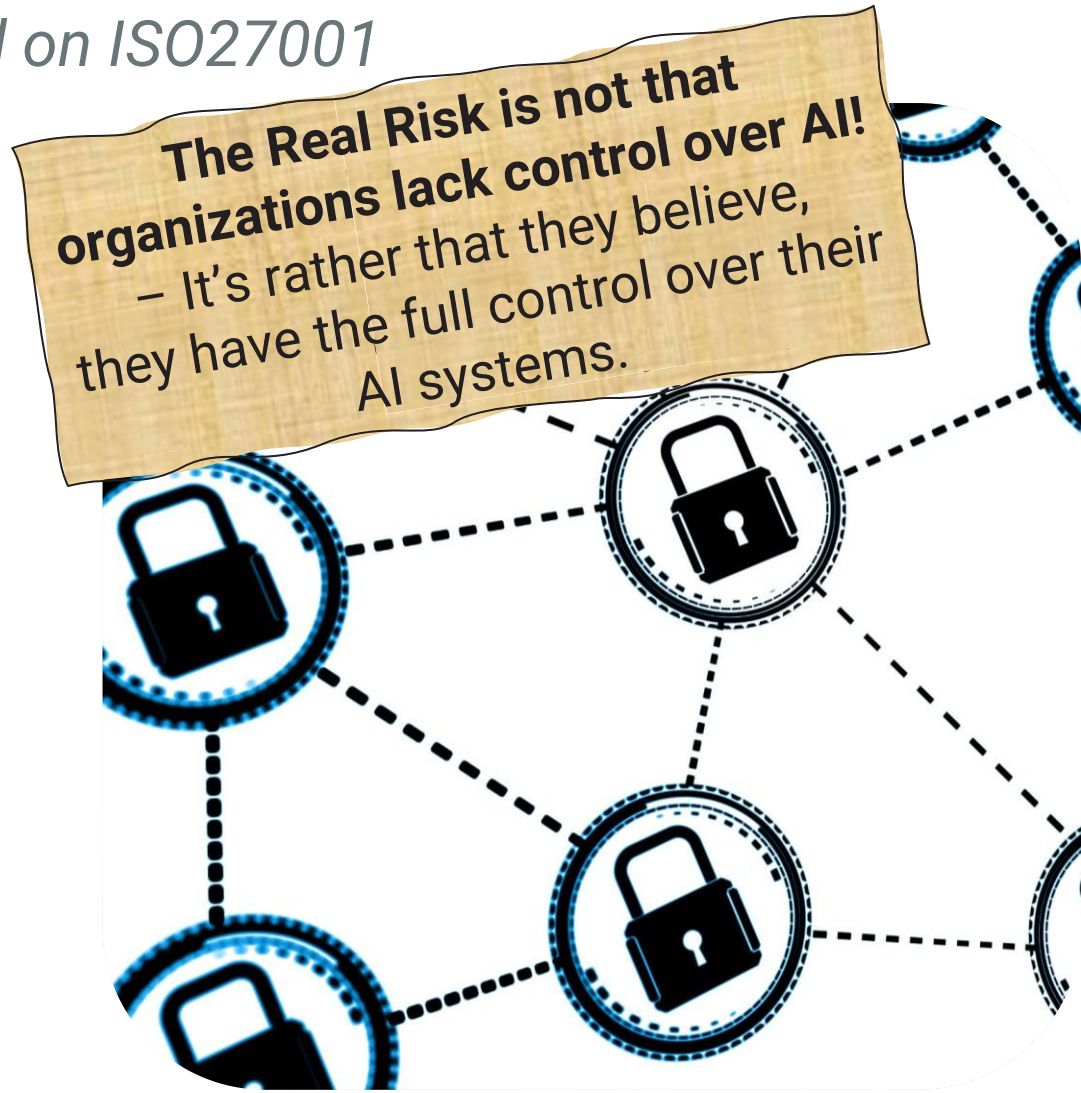
Is Standalone-ISO27001 still Sufficient?

AI Requires More beyond Traditional ISMS based on ISO27001

- **Limited Scope**: Focus on Information, Not AI Behavior
  → *no coverage of model logic, learning dynamics, decisions*
- **Missing AI-Specific Risk Dimensions**
  → *bias, hallucinations, explainability, model drift*
- **Lack of Controls for AI Lifecycle Management**
  → *no governance for training, validation, retraining*
- **Insufficient Data Governance for AI Use Cases**
  → *training data quality, lineage, representativeness*
- **No Governance for Automated Decision-Making**
  → *lack of oversight, accountability, escalation paths*
- **Inadequate Coverage of AI-Specific Attack Vectors**
  → *prompt injection, data poisoning, model manipulation*
- **Compliance Gap with Emerging Regulations (EU AI Act)**
  → *missing requirements for high-risk AI systems*
- **False Sense of Security**: "ISO 27001 Certified = AI Secure"
  → *governance illusion, incomplete risk coverage*

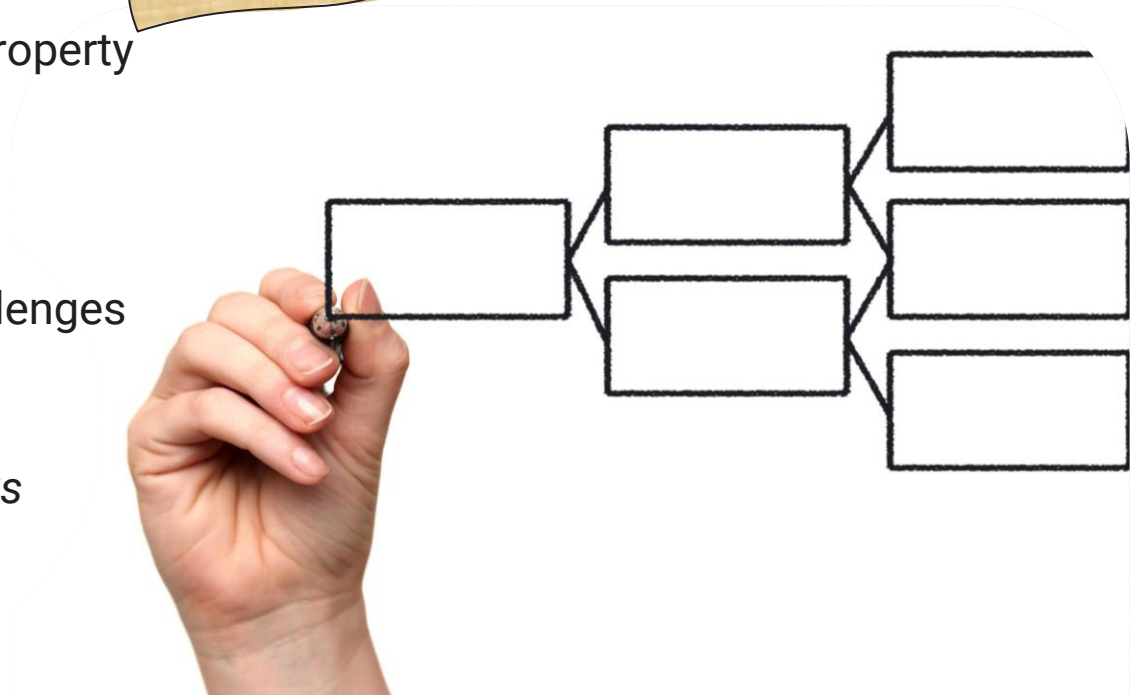


Prompt Injection, Data Poisoning & Model Leakage

Be Prepared for New Classes of Attacks against AI Systems!

- **New Attack Paradigm**: Targeting AI Logic Instead of Infrastructure
  → *manipulation of prompts, models, and outputs*
- **Prompt Injection**: Manipulating AI Behavior at Inference Time
  → *bypassing safeguards, extracting sensitive information*
- Data Poisoning: Corrupting Training and Fine-Tuning Data
  → *influencing model behavior before deployment*
- **Model Leakage**: Exposure of Sensitive Data and Intellectual Property
  → *training data extraction, model inversion risks*
- **Vulnerabilities in AI Pipelines and RAG Architectures**
  → *external data sources, embeddings, API integrations*
- **From Input Validation to Context Security**: New Defense Challenges
  → *lack of traditional boundaries and control points*
- **Detection & Monitoring Limitations in AI Environments**
  → *difficulty identifying manipulated outputs or hidden attacks*
- **Need for AI-Specific Security Controls and Governance**
  → *secure prompt design, data validation, model oversight*

The real challenge is that AI systems no longer fail only when systems break!
— It's when they behave exactly as designed, just under manipulated conditions.



Shadow AI in the Enterprise

Is Shadow-AI a New Kind of Shadow-IT in Your Enterprise?

- **From Shadow IT to Shadow AI**: Uncontrolled AI Usage by Employees
  → *use of ChatGPT, Copilots, external AI tools without governance*
- **Hidden Data Flows**: Sensitive Information in Prompts and Outputs
  → *data leakage, loss of confidentiality, regulatory risks*
- **Lack of Visibility and Control over AI Usage**
  → *missing inventories, undocumented AI use cases*
- **Circumventing Existing Security & Compliance Controls**
  → *bypassing DLP, access controls, approved processes*
- **Third-Party Risks through External AI Services**
  → *uncontrolled data sharing with providers, unclear processing*
- **Impact on Intellectual Property and Confidentiality**
  → *exposure of business logic, code, customer data*
- **Governance Gap**: Policies Not Adapted to AI Usage
  → *missing AI usage guidelines, unclear acceptable use)*
- **Need for Integrated AI Governance and Awareness Measures**
  → *policies, training, monitoring, technical controls)*

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Why “AI Professional” Education matters Now

AI Governance requires not only frameworks like ISO 42001 – but also qualified professionals capable of implementing them in practice.

Why does AI Governance require Qualified Professionals?

- **Bridges the competence gap**: From ISO 27001/42001 Frameworks to Implementation
  → translating governance requirements into operational practice
- **Comprehensive AI Governance Knowledge**: Risk Management, Ethics, Compliance and Lifecycle Management
  → aligned with ISO 42001 and regulatory expectations
- **AI-Specific Risk & Control Expertise**: Bias, Explainability, Robustness and Security
  → understanding and managing AI-specific risk dimensions
- **Support for EU AI Act Readiness**: Governance, Documentation and Auditability Requirements
  → enabling compliance with emerging regulatory frameworks
- **Enhanced Auditor & CISO Capabilities**: Interdisciplinary Skills across Security, Data and AI
  → bridging IT audit with AI system understanding
- **Practical Application Focus**: Real-world Scenarios, Use Cases and Governance Implementation
  → enabling immediate application in organizations
- **Globally Recognized Certification (PECB)**: Professional Credibility and Structured Knowledge Validation
  → demonstrating competence in AI governance and risk
- **Foundation for Trustworthy AI Adoption**: Enabling Responsible, Transparent and Controlled AI Usage
  → building trust in AI-driven decisions and systems

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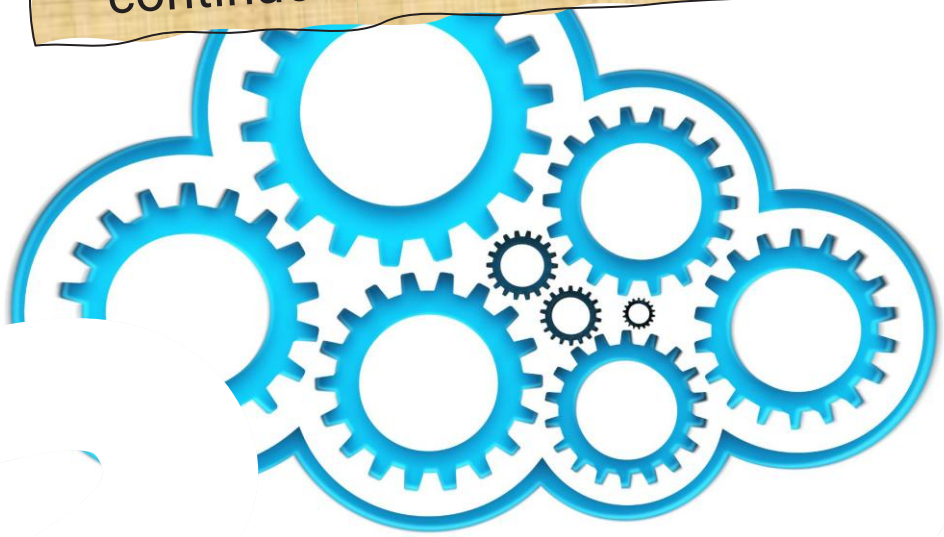
Auditing Approaches for AI Systems

How to Audit AI: New Controls, Auditor's Competences and Auditing Approaches?

- **From Control Testing to System Behavior Validation**
  → *evaluating outputs, decisions, and model performance*
- **AI-Specific Controls Beyond Traditional ISMS**
  → *model validation, bias testing, explainability checks*
- **Data-Centric Auditing**: Quality, Lineage and Representativeness
  → *training data governance as audit focus*
- **Lifecycle Auditing**: From Training to Deployment and Monitoring
  → *continuous assessment across AI lifecycle stages*
- **Evidence Challenges**: Limited Transparency and Black-Box Models
  → *explainability gaps, traceability limitations*
- **New Audit Techniques**: Testing Prompts, Outputs and Scenarios
  → *adversarial testing, simulation-based validation*
- **Expanded Auditor Competences**: Interdisciplinary Skill Sets
  → *AI, data science, risk, and regulatory knowledge*
- **Alignment with ISO 42001 and Regulatory Expectations**
  → *structured framework for AI governance audits*

Auditing AI is not just an extension of IT auditing!
— It requires a fundamentally new approach that focuses on behavior, data and continuous risk management.

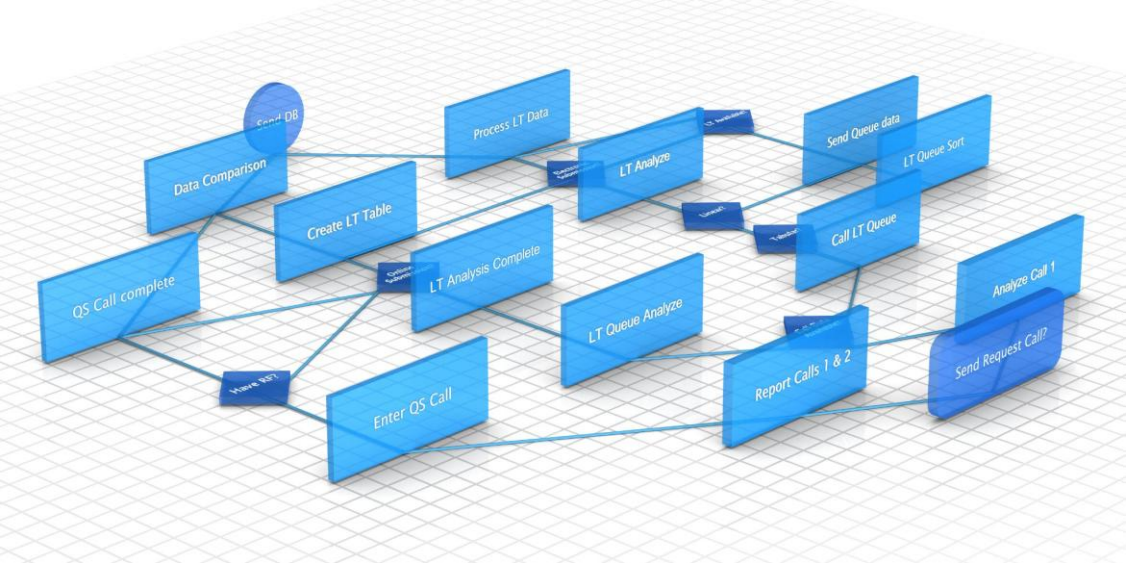


AI Supply Chain Risks

Who is Accountable and Responsible for the AI Model and AI-based Business Processes?

- **Complex AI Ecosystems**: Multiple Actors, Shared Responsibilities
  → *providers, deployers, integrators, data suppliers*
- **Blurred Accountability Across the AI Value Chain**
  → *unclear ownership of risks, decisions, and outcomes*
- **Dependence on Third-Party Models and Cloud Providers**
  → *external LLMs, APIs, managed AI services*
- **Lack of Transparency and Model Provenance**
  → *unknown training data, hidden model behavior*
- **Risks from Open-Source Models and Components**
  → *unverified code, hidden vulnerabilities, licensing risks*
- **Integration Risks in AI-Based Business Processes**
  → *embedding AI into critical workflows and decisions*
- **Vendor Risk Management Gaps for AI Systems**
  → *traditional TPRM not covering AI-specific risks*
- **Need for End-to-End AI Supply Chain Governance**
  → *contractual controls, transparency, continuous oversight*

In AI, responsibility cannot be outsourced!
— even if the model creation and operation is outsourced.



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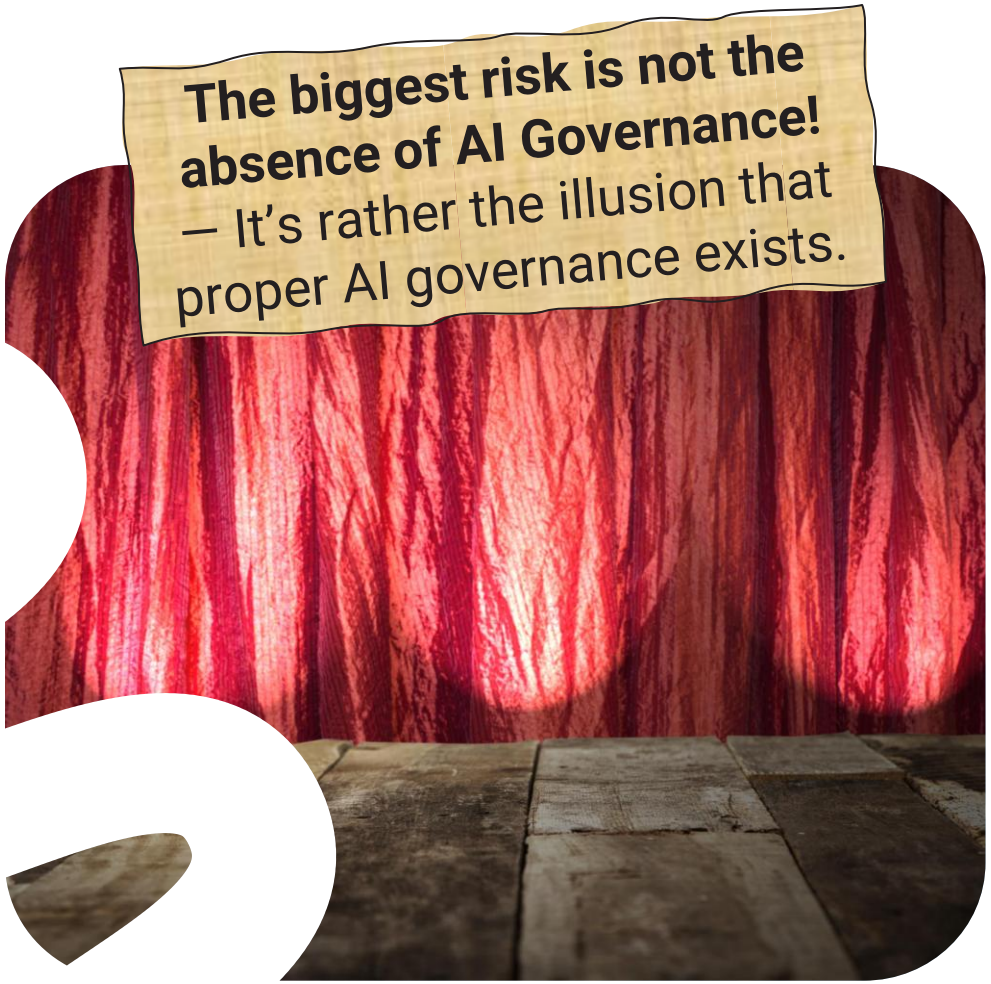
The “AI-Compliance Theater”

Between Real AI Governance and Marketing. What’s behind the “AI Inside” Label?

- **“AI Inside” as a Marketing Label vs. Real Governance**
  → *branding without underlying control structures*
- **Superficial Compliance vs. Effective Risk Management**
  → *policies exist, but are not operationalized*
- **Certification-Driven Approach vs. True Maturity**
  → *focus on passing audits instead of managing risks*
- **Lack of Measurable AI Governance Effectiveness**
  → *missing KPIs, unclear control performance*
- **Overreliance on Documentation Instead of System Understanding**
  → *paper-based compliance vs. real behavior assessment*
- **Misalignment Between Business Innovation and Governance**
  → *AI adoption outpaces control frameworks)*
- **Illusion of Control Through Existing Frameworks** (e.g., ISO27001)
  → *assuming current controls are sufficient for AI*
- **From Compliance Theater to Real AI Governance Maturity**
  → *embedding accountability, transparency, and continuous oversight*



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The Human remains the Big Risk

… even in the Age of AI, since Made, Controlled and Governed by Humans

- **Human Error Amplified by AI Capabilities**
  → *incorrect prompts, misinterpretation of outputs, operational misuse*
- **Overreliance on AI and Automation Bias**
  → *blind trust in AI decisions, reduced critical thinking*
- **AI-Enhanced Social Engineering Attacks**
  → *deepfakes, voice cloning, highly personalized phishing*
- **Lack of Awareness and Misuse of AI Tools**
  → *untrained employees, unintended risk exposure*
- **Insufficient Human Oversight of AI Systems**
  → *lack of review, missing escalation mechanisms*
- **Misalignment Between Human Intent and AI Outcomes**
  → *unintended consequences, misunderstood system behavior*
- **Accountability Gaps in Human–AI Interaction**
  → *unclear responsibility for AI-driven decisions*
- **Need for Human-Centric AI Governance and Training**
  → *awareness, clear responsibilities, embedded oversight*

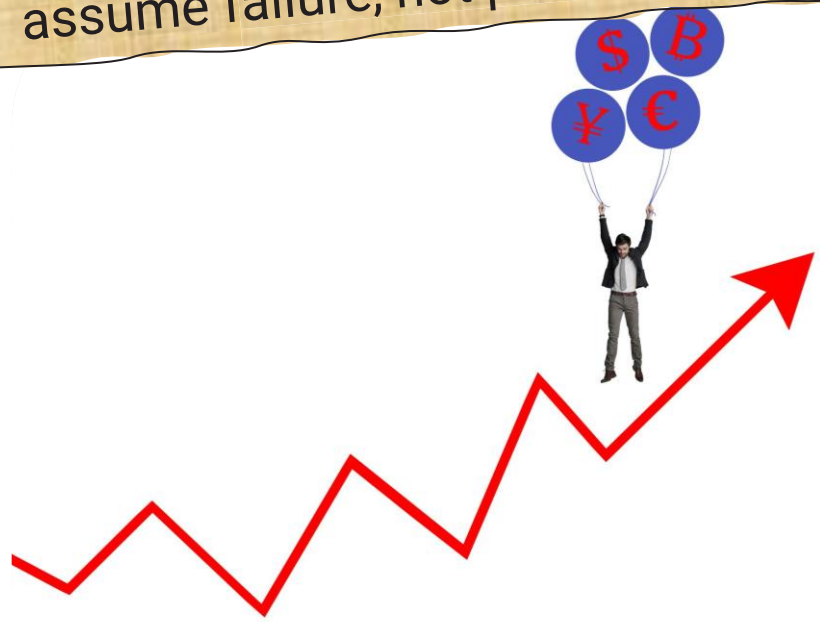
AI does not remove the human factor!
— It rather amplifies it, making governance of human behavior more critical than ever.

Errare Mechanicum Est – Non solum Humanum

What happens when AI Makes a Mistake, takes a Wrong Decision or Hallucinates?

- **AI Errors Are Systemic, Not Isolated**
  → *errors occur at scale across automated processes*
- **Hallucinations and Unreliable Outputs**
  → *plausible but incorrect or misleading results*
- **Lack of Explainability and Root Cause Analysis**
  → *difficulty understanding why decisions were made*
- **Cascading Effects in Automated Decision Chains**
  → *errors propagate across interconnected systems*
- **Impact on Business, Compliance and Reputation**
  → *financial loss, regulatory breaches, trust erosion*
- **Liability and Accountability for AI Decisions**
  → *unclear ownership of faulty outcomes*
- **Need for Incident Management and Escalation Processes**
  → *detection, reporting, and response to AI failures*
- **Designing for Failure: Resilient and Controlled AI Systems**
  → *safeguards, human-in-the-loop, fallback mechanisms*

AI does not fail like humans!
— It fails differently, at scale,
and often without warning.
That is why governance must
assume failure, not perfection.

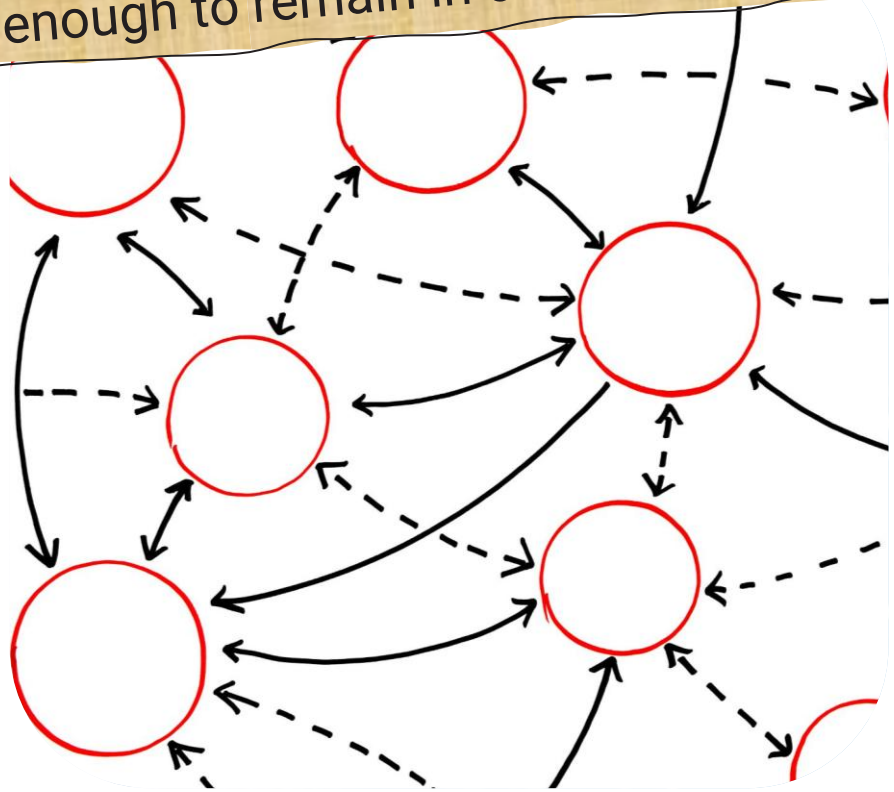


AI as a Tool for Auditing Human Behavior

Do Auditors have to Fear about their Jobs?

- **AI-Driven Audit Automation**: From Sampling to Full Data Coverage
  → *continuous auditing, anomaly detection across entire datasets*
- **AI as an Augmentation Tool** – It's not a Replacement for Auditors
  → *supporting analysis, not substituting professional judgment*
- **Automated Evidence Collection and Pattern Recognition**
  → *log analysis, behavioral insights, risk identification*
- **Shift from Manual Testing to Data-Driven Auditing**
  → *analytics-based assurance, real-time monitoring*
- **New Risks**: Bias, Overfitting and Incorrect AI Conclusions
  → *flawed models leading to incorrect audit results*
- **Need for Explainable and Audit-Ready AI Tools**
  → *transparency, traceability of AI-supported conclusions*
- **Changing Role of Auditors**: From Control Testing to Strategic Advisors
  → *interpretation, risk assessment, governance guidance*
- **Future Competences**: Combining Audit Expertise with AI Understanding
  → *data literacy, AI governance knowledge, critical thinking*

The real Question is not whether AI will replace Auditors!
– but whether Auditors will adapt fast enough to remain in control of AI.



Agentic AI and Autonomous Systems

Do Autonomous AI-based Agents Form the Next Governance Challenge?

- **From Assistive AI to Autonomous Decision-Making Systems**
  → *agents executing tasks independently without human intervention*
- **Delegation of Authority to AI Agents**
  → *automated actions impacting business processes and controls*
- **Loss of Transparency and Human Oversight**
  → *limited visibility into agent decisions and actions*
- **Dynamic and Self-Improving System Behavior**
  → *continuous learning, adaptation, and unpredictability*
- **Complex Interactions in Multi-Agent Ecosystems**
  → *autonomous agents interacting with other systems and agents*
- **New Risk Dimensions**: Control Loss and Unintended Actions
  → *cascading actions, misaligned objectives, emergent behavior*
- **Governance Challenges**: Defining Boundaries and Safeguards
  → *policies for autonomy levels, human-in-the-loop mechanisms*
- **Need for Advanced AI Governance Frameworks** (ISO 42001)
  → *structured oversight, accountability, and lifecycle control*

The real question is no longer whether AI can act autonomously!
— It's rather, whether organizations can still govern systems that act on their own.

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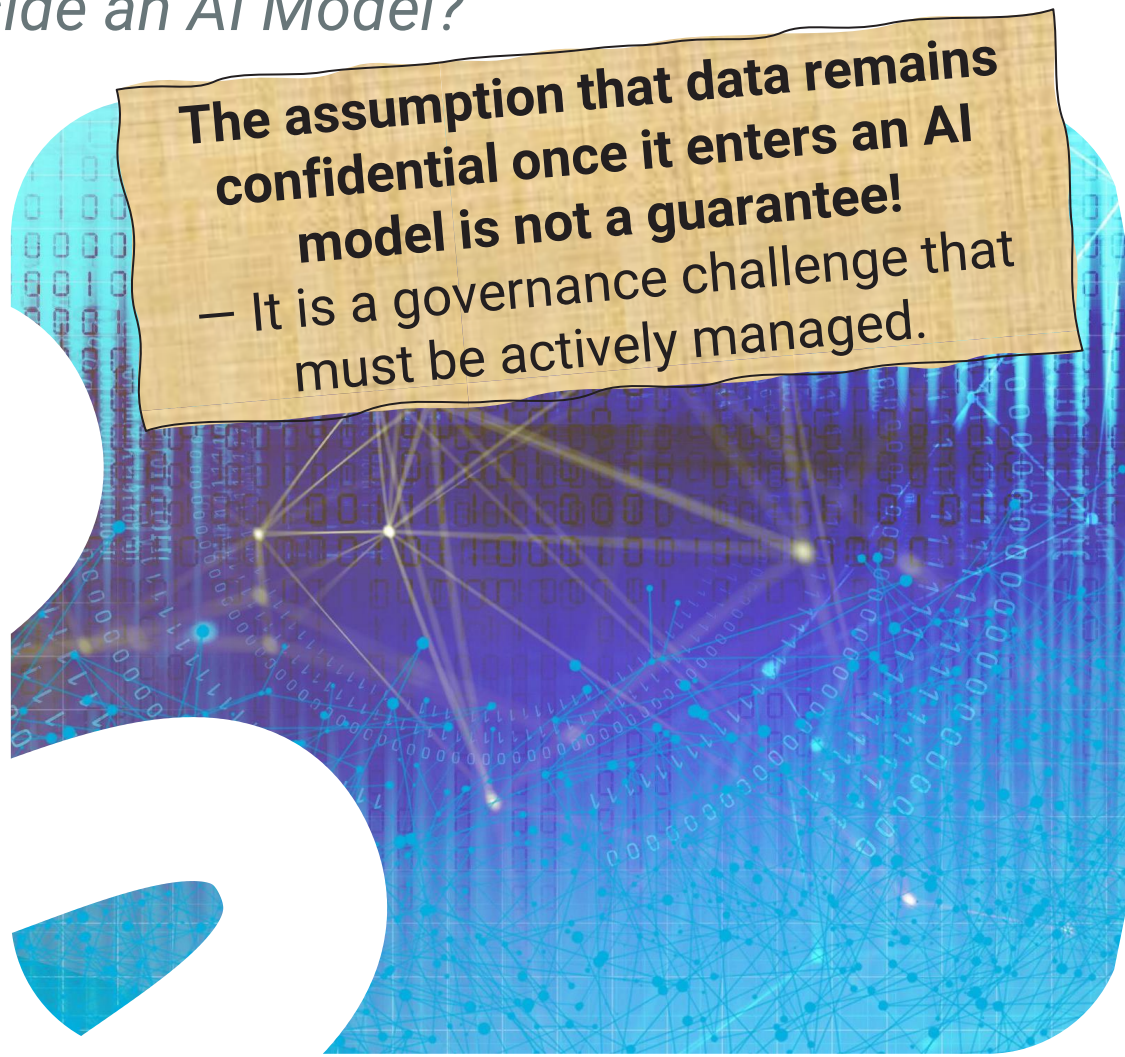
The Myth of Confidentiality on an AI Model

Are we able to Protect Information Residing Inside an AI Model?

- **Training Data Becomes Embedded in Model Behavior**
  → *indirect memorization, latent data representation*
- **Risk of Data Extraction and Model Inversion Attacks**
  → *reconstruction of sensitive training data*
- **Leakage through Prompts and Model Outputs**
  → *unintended disclosure of confidential information*
- **Limited Control over Data Once Used for Training**
  → *inability to fully delete or trace data usage*
- **Exposure Risks in Fine-Tuning and RAG Architectures**
  → *embedding internal knowledge into AI responses*
- **Challenges in Enforcing Data Confidentiality Requirements**
  → *mismatch with classical confidentiality controls*
- **Dependence on Providers and Lack of Transparency**
  → *unclear data handling in external AI services*
- **Need for Technical Safeguards and Governance Controls**
  → *anonymization, access control, secure architectures*



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Classical Zero-Trust Approaches meet AI

Are Security Architectures for an AI-native Enterprise Possible?

- **Zero Trust Principles Applied to AI Systems**
  → *"never trust, always verify" for users, data, models, and APIs*
- **New Trust Boundaries**: From Networks to AI Ecosystems
  → *models, pipelines, data flows, external services*
- **Identity & Access Management**: for Humans and Machines
  → *users, services, AI agents, API identities)*
- **Data Protection Across the AI Lifecycle**
  → *secure data handling from training to inference*
- **Securing AI Pipelines and Interfaces** (APIs, RAG, Integrations)
  → *end-to-end protection of AI components*
- **Continuous Verification of AI Behavior and Outputs**
  → *monitoring, validation, anomaly detection*
- **Challenges of Applying Zero Trust to Dynamic AI Systems**
  → *changing models, adaptive behavior, limited transparency*
- **Towards AI-Native Security Architectures and Governance**
  → *integration of Zero Trust with AI governance frameworks*

Zero Trust was designed for networks!
— Now it must evolve to handle systems that "think", "learn" and "act" on their own.

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Summary

Are organizations able to govern AI?

- **AI Governance today is more illusion than reality in many organizations**
- **ISO 27001 alone is no longer sufficient to manage AI-related risks**
- **AI introduces fundamentally new risk classes beyond traditional IT security**
- **The EU AI Act transforms AI governance from optional to mandatory**
- **AI risks are amplified by scale, autonomy, and lack of transparency**
- **Governance gaps increasingly arise from third parties and Shadow AI usage**
- **Auditing AI requires new approaches, controls, and competencies**
- **ISO 42001 and qualified AI professionals, like those educated by the PECB's CAIP course, are key enablers for trustworthy AI adoption**

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THANK YOU

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