
# The impact of AI on financial institutions

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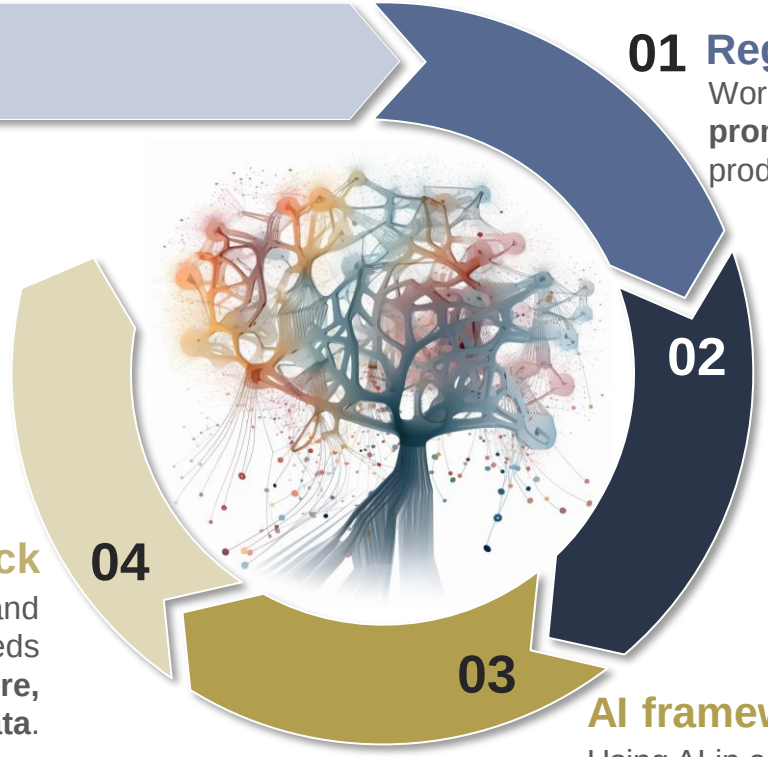
# 1 Introduction
## Industry stance

**Organizations are exploiting massive amounts of data and developing AI systems across industries and domains, triggering the first proposed draft AI regulations in several countries**

- A roadmap to the full integration of AI within an organization starts with its **compliance with upcoming AI regulation and its AI strategy and framework**, needing proper **IT infrastructure to support any use cases** within the organization.
- Management Solutions (MS), as a provider of analytical and cutting-edge professional services, has a consolidated practice in AI, manifest in specific **value propositions for these topics.**

### Development and use of AI

**05** AI is being **used for multiple purposes** within organizations across all countries and areas.



**01 Regulation and supervision**

Worldwide regulators aim to **establish a safe use of AI by promoting risk-based frameworks** to regulate AI applications, products, and services.

**02 AI adoption strategy**

Organizations are defining their **strategy to adopt AI** by comparing their current situation with regulatory requirements and best practice, and designing a roadmap.

**03 AI framework**

Using AI in an effective, safe and ethical manner requires **designing and implementing an AI framework** covering governance, organization, policies and procedures, continuous monitoring, etc.

**04 IT and data stack**

The increased complexity of AI models and higher computational requirements needs the setup of supporting **IT architecture, infrastructure and data**.

# 2 Use cases of AI in the financial industry

## Selection of AI use cases

### The use cases of artificial intelligence span all areas of a financial institution

| Scope | Use cases | Maturity | Description |
|---|---|---|---|
| **Business and Marketing** | Product prescriber | Pilot | Active product proposal according to the customer's context |
| | Market report generator | Pilot | Generates market trend reports from multiple sources |
| | Transaction categorizer | **Production ★** | Classifies transactions into detailed categories |
| | Investment assistant | **Production ★** | Consult fund info and create custom plans (e.g., Morgan Stanley, Betterment) |
| | Onboarding assistant | Pilot | Interactive guide for new customers in the registration process |
| | Customer service chatbot | **Production ★** | Resolves frequent customer queries via chat (e.g., Bunq) |
| | Call summarizer and QA | **Production ★** | Summarize calls and assess quality of interactions (e.g., ABN) |
| | Newsletter generator | Pilot | Write customized newsletters according to customer profile |
| | Competency report creator | Pilot | Analyzes competitors' products and strategies |
| | Content marketing QA assistant | **Production ★** | Analyzes compliance with marketing policies (e.g., CBA) |
| **Risk and Finance** | Credit file generator and analyzer | Pilot | Creates and analyzes credit files from customer data, including chatbot |
| | Credit rating based on social media | **Production ★** | Analyzes customer (corporate) disputes and feeds into credit ratings |
| | Fraud detector | **Production ★** | Identifies patterns of suspicious fraud transactions |
| | Validation report writer | Pilot | Proposes validation findings and their severity, and writes the validation report |
| | Financial statement analysis assistant | Pilot | Interprets and summarizes financial statements of companies |
| | Market report generator | Pilot | Creates reports on financial market conditions and outlooks |
| | Portfolio management assistant | Pilot | Proposes adjustments in investment portfolios according to risk profile |
| | Financial advice chatbot | Pilot | Offers personalized financial advice via conversation |
| **Control, Compliance and Audit** | Audit report generator | **Production ★** | Generates draft reports based on findings and regulations |
| | Suspicious transaction detector | Pilot | Complements AML/CFT identification of unusual transactions |
| | Compliance alert generator | Pilot | Monitors data and generates alerts for indications of non-compliance |
| | Compliance chatbot | **Production ★** | Resolves employee questions about policies and procedures |
| | Risk assessment assistant | Pilot | Identifies and assesses potential risks in business processes |
| | Audit plan generator | Pilot | Proposes the scope and focus of future audit work |
| | Compliance training program developer | Pilot | Design training courses tailored to the employee's risk profile |

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|---|---|---|---|
| **Legal** | Regulatory review assistant | **Production ★** | Monitors legal and regulatory changes of relevance to the bank |
| | Contract review assistant | **Production ★** | Analyzes contracts to detect high-risk clauses |
| | Legal report generator | **Production ★** | Writes reports on legal implications of products or services |
| | Sentence summary creator | **Production ★** | Summarizes court rulings highlighting key aspects for the bank |
| | Contract drafting assistant | **Production ★** | Proposes standard clauses and conditions in the creation of contracts |
| | Chatbot for internal legal consultations | **Production ★** | Resolves employees' doubts about legal aspects |
| | Predictor of judicial results | Pilot | Estimates the probability of losing a legal proceeding |
| **Organization and People** | Recruitment Assistant | Pilot | Filters CVs and proposes candidate rankings according to job requirements |
| | Employee information chatbot | **Production ★** | Provides information to Persons about the professionals (CV, evaluation, etc.) |
| | Position description generator | Pilot | Writes job descriptions based on key responsibilities |
| | Creator of training itineraries | Pilot | Design training and development plans according to the employee's profile. |
| | Employee support chatbot | **Production ★** | Attends to employee inquiries about benefits, vacations, etc. |
| | Internal communications generator | Pilot | Drafts internal communications adapting the message according to the audience |
| **Technology and Operations** | Technical documentation generator | Pilot | Creates user manuals and technical guides from specifications |
| | Document sorter | **Production ★** | Classifies documents (e.g., invoices, contracts) automatically |
| | Information extractor | **Production ★** | Extracts data from large documents (e.g., 1000-page pdf) and tabulates it. |
| | Software testing assistant | Pilot | Proposes test cases based on functional requirements |
| | Code error detector | **Production ★** | Identifies and suggests bug fixes in source code |
| | Programming language translator | **Production ★** | Convert code between different programming languages |
| | Technical support chatbot | Pilot | Provides first-level support for technical issues |
| | Unit test generator | Pilot | Proposes and develops unit tests to be performed on existing processes and code. |

# 3 AI regulatory landscape

## General overview

**Recent advances in Artificial Intelligence (AI) capabilities are pushing regulators worldwide to establish regulations and different types of guidelines for the appropriate use of AI**

### Worldwide regulation on AI

- The **European AI Act** is the first ever legal framework on AI. The US has also taken an approach towards AI through the issuance of the **AI Bill of Rights.** These two are considered the most relevant reference standards.
- Some **other countries** are also taking steps for regulating the AI (see map below).
- At **international level**, there are also some initiatives. For example, the NIST guidelines, the OECD recommendations on AI, IOSCO guidance on the use of AI, and UNESCO recommendations on Ethics of AI.

**Regions and countries with AI regulation (non-exhaustive)**

- European Union
- United Kingdom
- France
- Spain
- Germany
- Netherlands
- Poland
- Australia
- New Zealand
- Singapore
- Canada
- Japan
- South Korea
- China
- India
- Indonesia
- Israel
- United Arab Emirates
- Saudi Arabia
- Egypt
- Brazil
- Chile
- Peru
- Argentina
- Mexico
- Colombia
- Turkey.

# 3 AI regulatory landscape

## EU and USA: Main characteristics of reference standards

**While the AI Act will set the legal framework in Europe, the AI Bill of Right in the US is a set of principles to help guide the design, use, and deployment of automated systems**

| | AI Act (Europe) | AI Bill of Rights (US) |
|---|---|---|
| **Objective** | • Improve the functioning of the internal market by laying down a **uniform legal framework,** in particular for the development, marketing and use of AI in conformity with EU values | • Help **guide** the **design**, **use**, and **deployment** of **automated systems** to protect the rights of the US public in the age of AI |
| **Publication Date** | • **April 2021** (first draft).<br>• **March and June 2024** (Parliament and Council approval) | • **October 2022 (draft)** |
| **Scope** | • AI system providers<br>• AI system users<br>• Deployers, importers and distributors of AI systems and affected persons located in the EU | • Designers<br>• Developers<br>• Deployers of automated systems |
| **Enforceability** | • **Mandatory,** applicable in the Union's 27 countries | • **Voluntary** white paper (+ US President's Executive Order) |
| **Main content** | It sorts AI applications into risk levels:<br>• **Unacceptable risk** (prohibited practices)<br>• **High-risk** (subject to a set of requirements and obligations)<br>• **Minimal risk**<br>• Certain AI systems pose **transparency** risk and/or **systemic risk** and are subject to additional obligations. | **5 principles**<br>• Safe and effective systems<br>• Algorithmic discrimination protection<br>• Data privacy<br>• Notice and explanation<br>• Human alternatives, consideration and fallback |
| **Next steps** | • Fully applicable in 24 months[1] for high-risk AI systems. | • There is no official calendar for next publications |

1. Counting from its publication in the EU Official Journal. Except for: bans on prohibited practices, which will apply six months after the entry into force date; codes of practice (nine months after entry into force); general-purpose AI rules including governance (12 months after entry into force); and obligations for high-risk systems (36 months).

# 3 AI regulatory landscape

## Main requirements in the AI Act

**Proposals for AI regulation aim to address the potential risks, limitations, and ethical concerns associated with AI models while promoting their responsible development, implementation and use of these models**

### Overview of AI regulatory requirements

### Transparency and explainability

Communication to customers
Explanability of the model
Right to an explanation

### Fairness and bias

Protected attributes
Identification of biases
Correction of biases
Challenges: unobservable attributes, correlations

### Robustness and reliability

Performance evaluation
Robustness (adversarial attacks, sensitivity...)
Human-in-the-loop
Human fallback

### Accountability

Accountability lies with the AI user

### Privacy and security

How AI handles and protects user data
Risks of unauthorized disclosure or misuse
Data protection, consent, anonymization
Cybersecurity requirements

### Ethics and sustainability

Evaluate ethical implications of AI models
Have experts in AI ethics
Measure impact on the environment (e.g., emissions)

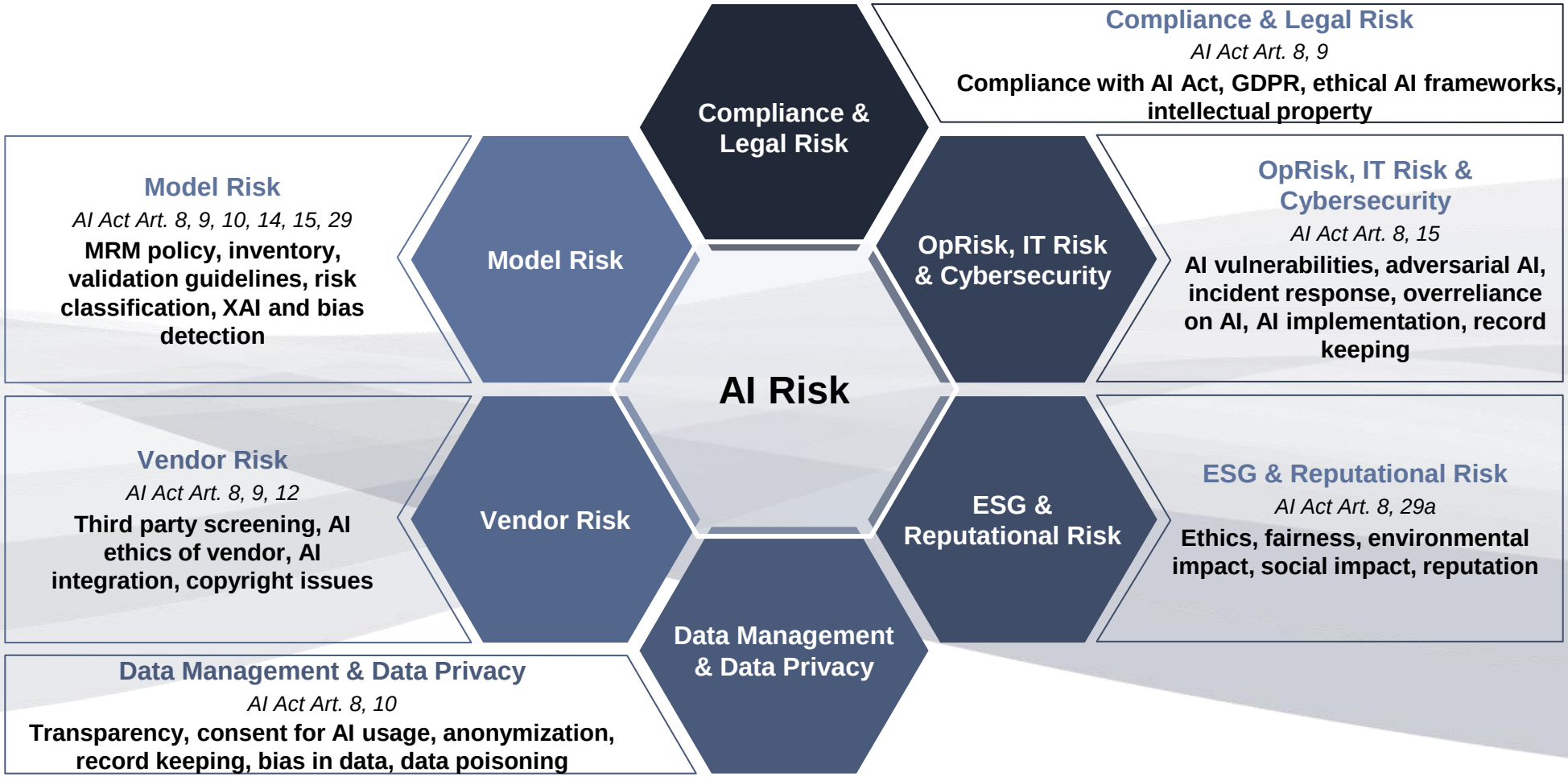
### Risk assessment and governance

Assessment of all AI risks
Audit and regulatory oversight

# 3 AI regulatory landscape

## A 360 degrees risk assessment

**Controlling AI risks involves identifying and assessing how AI amplifies current risks, and leveraging existing controls or defining new ones to minimize inherent risks**



# 3 AI regulatory landscape

## Implications of AI regulation – a brief summary

**Adopting artificial intelligence in an organization and ensuring compliance with AI regulation entails a series of implications along several dimensions**

### Context, regulation and supervision

1. **Regulation screening:** Monitoring of applicable regulation (GDPR, EU AI Act, US AI Bill of Rights, etc.) and supervisory activities (ECB, AESIA, etc.).
2. **Regulatory gap analysis:** Gap assessments against local and global AI regulations, and design and implement remediation plans.
3. **Reporting and supervisory relations:** Coordination of relation with supervisors, reporting requirements and regulatory inspections, and prepare AI system documentation submissions.

### AI strategy

1. **Strategy:** AI positioning, risk appetite for AI risk (model, legal, reputational…).
2. **AI Adoption:** As-is and analysis of the current situation, AI adoption plan.

### AI framework

1. **Governance:** Committees and task forces to adapt to AI regulation and oversee AI risk. PMO to coordinate efforts and adapt to regulatory changes.
2. **Roles and responsibilities:** New figures created or adapted within the organization, such as the Chief AI Officer / Chief AI and Technology Officer, covering all stages of the AI model lifecycle.
3. **Policies and procedures:** Review or development of internal policies and procedures regulating data, use and definition of AI systems, incl. modelling and validation frameworks, transparency and ethics guidelines, data procedures, etc., and monitoring measures.
4. **Risk management:** Initial identification, inventory, and risk assessments and classification of AI model uses (e.g., unacceptable / high / limited / minimal risk, following EU AI Act).
5. **AI (re-)skilling:** Gearing up of operating AI skills at all levels of the organization.

### Development and use of AI

1. **Business use case selection:** AI use case selection and investment procedure in pilots (MVPs).
2. **AI system development and validation:** Development and validation of AI models in compliance with regulatory requirements (supervised and unsupervised learning, GenAI and NLP…), automation of AI model reports and tools, definition of working methodologies (e.g., Agile) and profiles (e.g., data scientist, data engineer, data analyst…).
3. **Monitoring:** Definition and implementation of monitoring measures and appropriate human oversight for AI systems. Implementation and review of record-keeping and logs for AI systems. Review of the correct use of deployed AI systems, and monitoring of their compliance.
4. **Interpretability & fairness:** Implementation of Explainable AI (XAI) frameworks, address potential biases and design fairness metrics, model biases, non-discrimination.

### IT and data stack

1. **Technology roadmap:** Development of a technology roadmap for developing, deploying and using AI according to the level of adoption of the entity.
2. **Infrastructure:** Cloud deployment (AWS/Azure/Google...) to enable parallel computing and scalability, and the use of Big Data solutions. Vendor vs in-house requirements.
3. **Architecture:** Design of architectures that allow the efficient use of the infrastructure by the different departments / users, resource management (e.g., use of GPUs, storage), use of innovative architectures (e.g., federated learning).
4. **Data and IT security:** Revision of the data framework (BCBS239, GDPR) to incorporate AI requirements (e.g., transparency, privacy, security, bias) and facilitate the use of unstructured data (e.g., creation of data lakes), IT security requirements.
5. **MLOps and open-source:** Adoption of MLOps philosophy and migration towards open-source languages (e.g., Python, PyTorch), use of open-source models (e.g., HuggingFace, Meta),
6. **Sandbox:** Creating of a sandbox for AI prototyping.
7. **LLMs:** Model adaption and infrastructure selection for LLM fine-tuning, privacy, traceability, integration with other systems, response time, etc.

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