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ENGINEERING

Service Overview

AI ACT

Navigate the AI landscape with confidence:
Your partner for AI compliance and innovation

AI Act
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1. MOTIVATION

Artificial Intelligence (AI) is revolutionizing the world of work in ways that were previously unimaginable. With its ability to analyze huge volumes of data in a short space of time, recognize patterns and make decisions, AI can help many businesses to significantly increase their efficiency, reduce costs and develop innovative business models. These technological advancements are driving profound changes in nearly all industries.

A study by the Association of the Internet Industry forecasts a total potential of 480 billion euros for the German economy. Similarly, studies suggests that the global market volume for AI could increase twentyfold by 2030. [1] One striking example is the use of AI in the healthcare sector: According to a study by the Boston Consulting Group, AI could generate annual savings of up to 125 billion euros for the German healthcare system – equivalent to 25% of total expenditure. [2] AI is also already showing remarkable success in agriculture, where precise weather forecasts and soil analyses are significantly increasing crop yields.
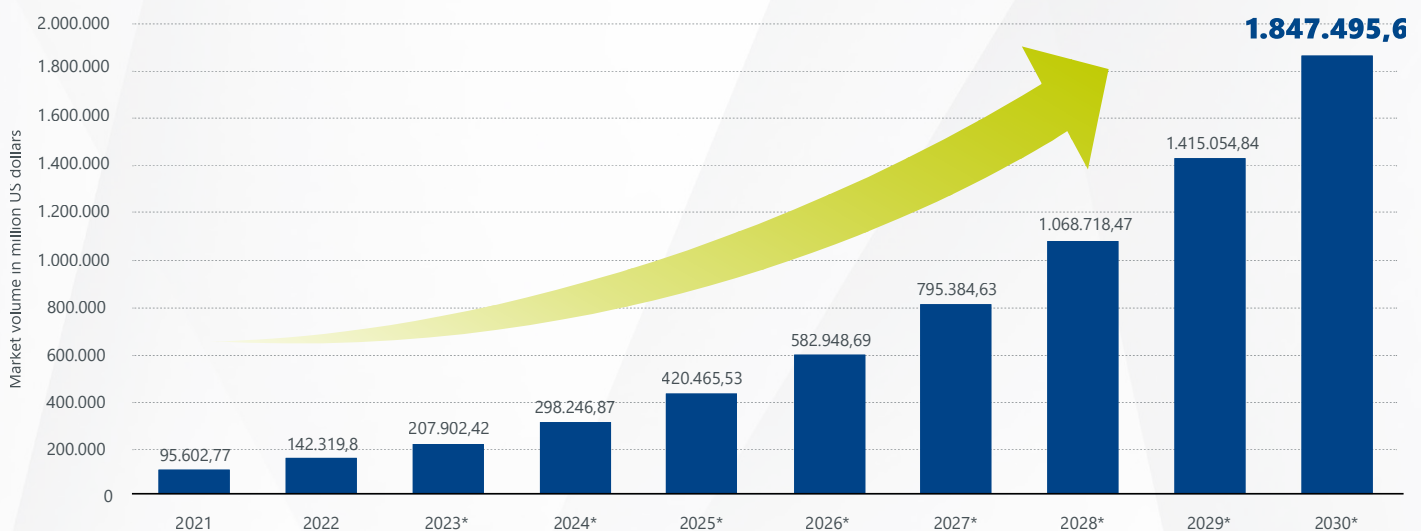
Market volume for AI worldwide in 2021 and 2022 with a forecast up to 2030 (in USD million)[1]

Framework conditions for law and ethics

However, the use of AI not only offers technological and economic benefits but also raises complex legal and ethical questions. The AI Act of the European Union, which came into effect in August 2024, establishes clear framework conditions for the use of AI systems in order to ensure safety and transparency while simultaneously protecting citizens' rights and freedoms.

2. UNDERSTANDING THE AI ACT

The AI Act serves as a compass, guiding you through the complex web of artificial intelligence. It defines clear rules and standards essential for the safe and ethical deployment of AI systems within the EU. By understanding and correctly implementing the AI Act's requirements, you can ensure that your AI projects are not only innovative, but also trustworthy.

Consideration of use cases

Instead of relying on technical algorithms, the compliance check under the AI Act considers use cases. The same AI technology can be applied in multiple use cases, and these may each be subject to different regulatory requirements depending on the specific application. For the legislator, the focus is on what AI is used for. There are then requirements governing HOW it is implemented.

Definition of AI systems

The AI Act itself does not define artificial intelligence but instead generally refers to AI systems. This category includes not only modern LLMs (Large Language Models) but also more traditional machine learning approaches such as decision trees, random forests and neural networks. With this broad approach, legislators want to ensure that adjustments to the legal text due to technological progress in this innovative field can be reduced.

Risk-based classification

Not all AI systems or use cases are the same. The AI Act distinguishes between different risk categories, each with specific requirements. Starting with AI systems with no particular risk, through high-risk AI systems, such as those used in safety components, for example, or those that enable deliberate manipulation, to AI systems with unacceptable risks, these requirements become more extensive or, in the latter case, operation is prohibited.

Risk model of the EU AI Act
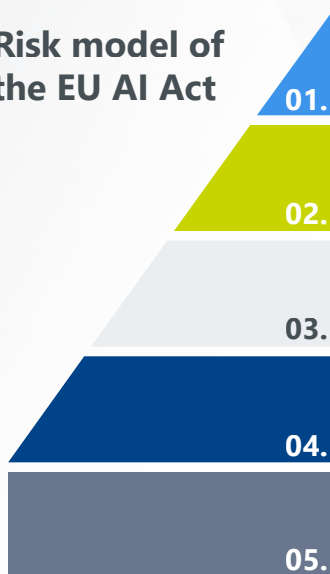
01.
UNACCEPTABLE RISK
E.g. social scoring, emotion recognition at work, exploitation of people's vulnerabilities

02.
HIGH RISK
E.g. selection of applicants, emotion recognition of customers, evaluation of learning outcomes, considerable damage in the event of incorrect functioning, use in sensitive environments

03.
LIMITED RISK
E.g. chatbots, recommender systems, AI photo filters, etc.

04.
MINIMAL OR NO RISK
E.g. AI-based translation, game assistants in video games, spam filters, etc.

05.
GENERAL PURPOSE AI
E.g. Google Gemini, GPT-4 from OpenAI, LLaMA from Meta, Mixtral from Mistral, etc.

Risk model of the EU AI Act[2]

2. UNDERSTANDING THE AI ACT

Roles

The AI Act differentiates between various roles when AI systems are deployed. Providers of AI systems are typically companies that develop, train and prepare AI systems for operation. Operators, on the other hand, are companies that actively use the AI systems or offer them to private individuals. Providers and operators of AI systems must meet different requirements depending on the AI system's risk category. Depending on the circumstances, a company may act as both provider and operator, or the provider role may be transferred to the operator. Additionally, the AI Act defines further roles that may also be relevant.

Transparency is key

Consumers have the right to know when they are interacting with an AI system. The AI Act therefore stipulates that AI systems must be designed with transparency in mind. This requirement already applies to AI systems classified as low-risk, meaning that nearly all AI systems in use must comply.

Human oversight

Despite the increasing capabilities of AI systems, humans remain responsible. The AI Act highlights the importance of human oversight and control for high-risk applications. However, the content of other AI systems is also subject to human oversight, for example, in the form of approvals of the generated content.
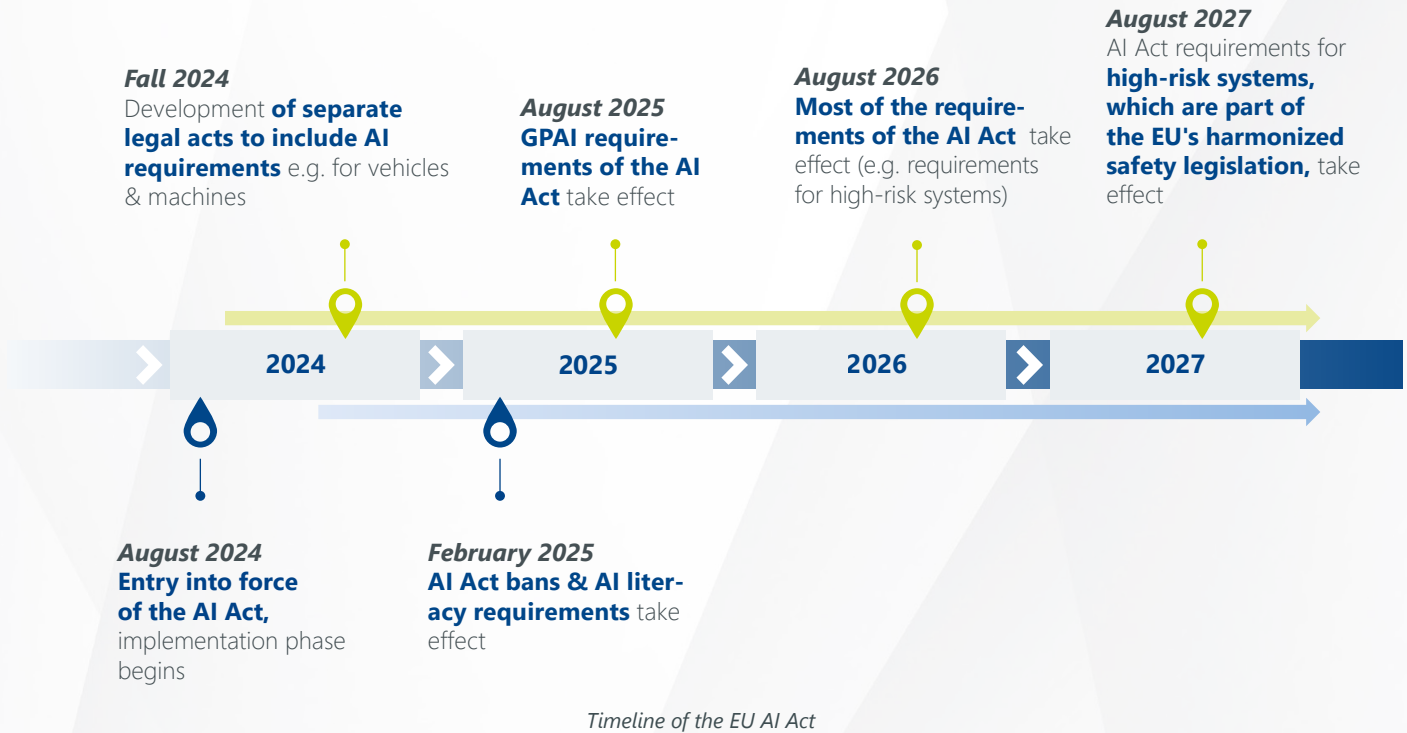
Data quality is crucial

The quality of the data used to train an AI system significantly determines its performance. The AI Act therefore imposes strict requirements on data quality and data governance. Only clean, well-prepared data enables reliable decision-making. In addition to meeting legal requirements, high data quality is also fundamental for ensuring optimal results from AI systems.

To reinforce the objectives of the AI Act, the law stipulates severe penalties for violations. Depending on the nature of the violation, penalties can reach up to €35 million or 7% of total global annual revenue, posing a significant risk to any business activity of companies.

3. NEED FOR ACTION FOR COMPANIES WHEN USING AI: TIMEFRAME AND MEASURES

Fall 2024
Development **of separate legal acts to include AI requirements** e.g. for vehicles & machines

August 2025
GPAI require-ments of the AI Act take effect

August 2026
Most of the require-ments of the AI Act take effect (e.g. requirements for high-risk systems)

August 2027
AI Act requirements for **high-risk systems, which are part of the EU's harmonized safety legislation,** take effect

2024   2025   2026   2027

August 2024
Entry into force of the AI Act, implementation phase begins

February 2025
AI Act bans & AI liter-acy requirements take effect

Timeline of the EU AI Act

The AI Act applies according to the market location principle, meaning that it is enforced regardless of a company's location as soon as an AI system is deployed or made accessible within the European Union. It also applies across all sectors and therefore applies comprehensively. Although the AI Act already came into effect in August 2024, its requirements must be implemented gradually according to different periods of validity (see figure).

A reason to relax? Not at all! Knowing the requirements at an early stage enables businesses to incorporate them into the conceptual phase and thus integrate them into the development with minimal effort during the implementation of AI projects. Subsequently implementing these requirements is sometimes only possible with a great deal of effort. An

example: If training data does not meet the AI Act's required quality standards, all models trained or even pre-trained on this data would be non-compliant with the AI Act. Preparation of the data is therefore automatically followed by starting from scratch in terms of training the models.

To ensure applicability in already regulated sectors within the EU while avoiding conflicting regulations, the AI Act applies indirectly in these areas – such as in the automotive sector. It stipulates that corresponding requirements must be defined in the relevant regulations. While some questions remain unanswered, it is advisable to familiarize oneself with potential requirements and their implementation now, given the often lengthy development cycles.

4. YOUR CHALLENGES – OUR TAILORED SOLUTIONS

For this reason, it is crucial for companies to work with AI experts from the outset. It is important to develop a sound and future-oriented strategy - one that not only harnesses the full technological potential of artificial intelligence but also ensures compliance with all requirements of the AI Act. Only through a deep understanding of the regulatory landscape can companies use the full range of benefits offered by AI while effectively addressing legal risks and ethical pitfalls.

How can these new AI Act requirements for AI system development and processes be established leanly and efficiently in your own company? What could a comprehensive yet lean AI strategy that is tailored to the company's structure look like? Before implementing one of the many existing tools on the market for capturing, assessing and managing AI systems, a precise needs assessment should be conducted. Additional software may not always be necessary – already established systems can also be adapted and used to organize the individual AI strategy.

Our approaches for your data-driven & AI-driven organization

With our expertise, we focus on several key areas to ensure the effective use of data and artificial intelligence.

First and foremost, we attach great value to **governance and management** by defining clear guidelines and responsibilities that enable the efficient use of data and AI.

We also develop a tailored **data and AI strategy** that goes beyond well thought-out planning to include customized training programs for your teams, optimizing the practical application of data and AI.

Together with you, we work towards the vision of an **AI-assisted company**, where AI-driven solutions enable the automation of processes and thus increase efficiency.

One important step on this path is building a **data-driven company**. Here, we focus on building technical and procedural structures that enable your company to make data-based decisions and foster the strategic use of data.

We also foster a **strong data culture and mindset** within the company by developing AI-supported, data-literate teams and cultivating a corporate culture that supports responsible, data-driven decision-making.

4. YOUR CHALLENGES – OUR TAILORED SOLUTIONS

Our approaches for your data-driven & AI-driven organization

With our expertise, we focus on several key areas to ensure the effective use of data and artificial intelligence.

We start with your challenge...

Focus on strategy		Focus on implementation	

MANAGEMENT CONSULTING

Holistic **strategy** development & joint **transformation** management

ENGINEERING CONSULTING

Consulting on **methods, processes & tools** in digital engineering

DIGITAL ENGINEERING

Customized **software and system development**

ENGINEERING SERVICES

Domain-specific **IT services & solutions**

...advise holistically ...   ... and implement practically ...

Learning with the ITK Academy

In addition to identifying relevant use cases and implementing new AI tools, it is essential to train employees accordingly to ensure that these tools are used efficiently and to their full potential. Just as a new wrench in a workshop may initially seem useful, it only develops its full potential when all employees understand how to use it and are aware of the associated risks. This is where the ITK Academy comes in. It offers customized training programs, either as general courses or tailored to your specific processes and tools. Our team supports you not only with the practical implementation of the training sessions but also in assessing needs and developing tailored training concepts.

5. AT A GLANCE

Why the EU AI Act is important for your company – even if you don't develop AI

Key dates and requirements:

- 1. August 2024: The EU AI Act comes into force
- 2. February 2025: Enforcement of bans on certain AI practices and requirements relating to AI proficiency for all employees who use or develop AI systems
- 2. August 2026: Deadline for compliance with regulations for high-risk AI systems and transparency requirements for nearly all AI systems

Steps for compliance with the regulations

- **Identify your AI use cases:**
    - Determine which AI systems are in use within your organization.
    - Assess the risk category of AI systems, as defined by the AI Act.

- **Recognize prohibited AI practices:**
    - Understand which AI practices are prohibited under the new regulations, such as subliminal techniques and manipulative methods that could distort human behavior.
    - Ensure that none of your AI systems apply these practices.

- **Promote AI expertise:**
    - Inform and train your team on the ethical use of AI.
    - Develop programs that promote understanding of AI technologies, their benefits and risks.
    - Raise awareness of the regulatory requirements and the importance of compliance.

- **Prepare for the AI regulations for high-risk systems:**
    - Begin aligning your high-risk AI systems with the upcoming requirements now.
    - Conduct thorough risk assessments and implement necessary safeguards.
    - Develop a robust AI governance framework to ensure ongoing compliance with regulations and ethical AI usage.

How we can help: Building an efficient AI governance structure is key to meeting these regulatory requirements. Our team of experts can support you in a number of ways:

AI governance framework: We can help you to establish a comprehensive governance framework tailored to your company's needs.

Compliance strategy: We can develop and implement strategies to ensure your AI systems comply with the AI Act.

Training and AI competence programs: We can provide training to improve AI competence within your organization.

Establishment of development processes: We can help you implement AI use cases quickly and efficiently within the framework of legal and normative requirements

Navigating the AI Act can be complex, but with our expertise, you can ensure that your company not only meets legal requirements but also benefits from the ethical and responsible use of AI.

6. SUMMARY AND OUTLOOK

The EU AI Act provides a regulatory framework to ensure compliance with fundamental EU rights. Compliance with these rules is ensured by a comprehensive AI governance strategy. However, this strategy should extend beyond mere AI compliance. It enables companies to critically evaluate their own processes, identify AI opportunities within the company and leverage them profitably to create synergies. Which processes can be optimized with the help of AI? ITK will help you analyze these processes and, if needed, can directly optimize and implement them in consultation with you.

Data forms the foundation of every decision and should be understood as a strategic resource within your organization. Its use, along with the possibility to optimize workflows based on consistent data using AI, is transforming how companies make decisions and drive innovation. With our support, you can build an AI-supported and data-driven organization that makes informed decisions, automates processes and unlocks new business opportunities.

7. REFERENCES

[1] Statisa - Next Move Strategy Consulting
[2] Artificial intelligence: high savings potential through AI in the healthcare system, only available in German
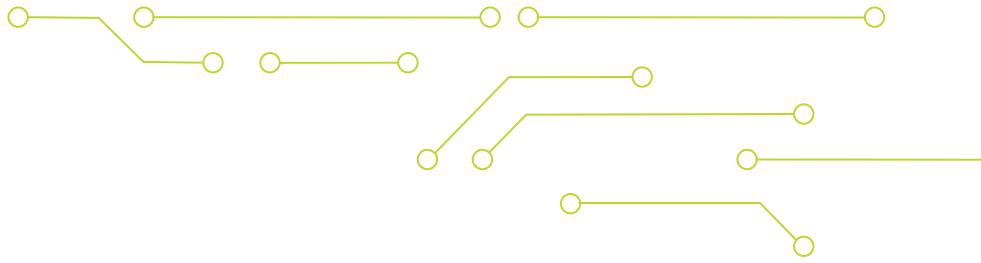
ITK ENGINEERING

Stability, reliability and methodological expertise – this is what we have stood for since our founding in 1994. At all times, our customers have benefitted from our dedicated multi-industry know-how, especially in the fields of control systems design and model-based design. Customers can count on us – from conception to deployment, we cover the entire development process.

Our areas of expertise include:

- Software development
- Hardware development
- Electrical & electronic systems
- System integration

- Software as a product
- Turnkey systems
- Customer specific development
- Technical consulting

- Seminars
- Quality assurance

The satisfaction of each of our partners and mutually respectful cooperation shape our corporate philosophy, in which four values are firmly anchored: Read more about this on the web.

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