TÜVNORD

Looking into the future

(TÜV NORD founded in 1869)

Dagmara Żygowska | TÜV NORD Czech | 26.11.2024

TÜV NORD GROUP - International Projects

NPP Barakah 1-4, UAE
APR-1400,
Safety review,
units 1&2 in operation

NPP Leibstadt, Switzerland
BWR-1300,
Review of modernization
YUMOD since 2008

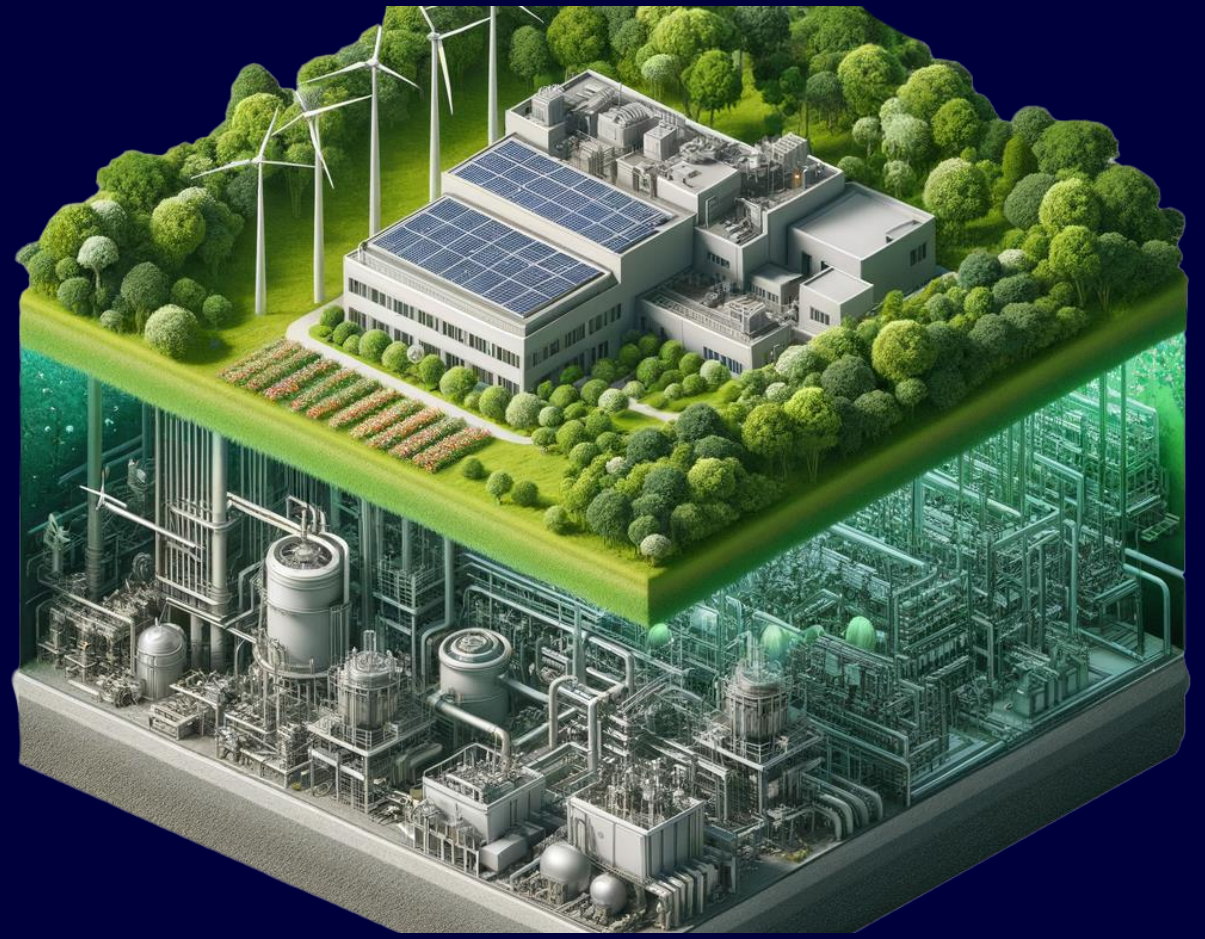
NPP Angra 3, Brazil
PWR-1300
Design review of systems and components (SSC)
Construction since 2010

Pilot Conditioning Plant Gorleben, Germany
Complete licensing review
1990-1998

NPP Hanhikivi, Finland
WWER-1200
Review of safety systems
Project cancelled 05/2022

Fuel Fabrication Plant Lingen, Germany
Review for licensing, continuous inspection
Operating since 1979

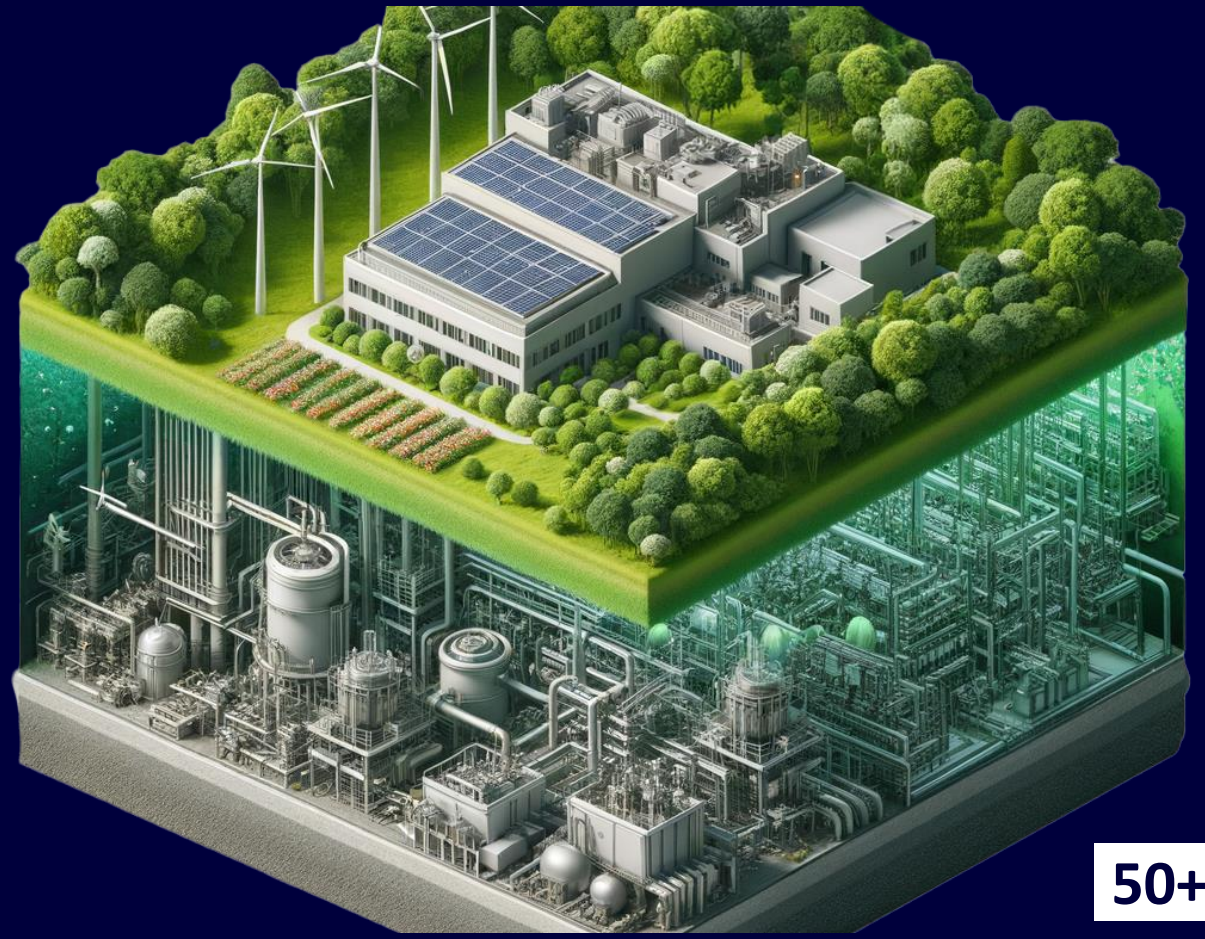
TÜV NORD Czech – focused on Quality / short intro



TÜV NORD from outside – what you see:

- Audits as the third and second party
- Inspections – under notification, accreditation, authorization and group procedures
- Conformity assessments – group procedures
- Certification of management systems, products and personel – accredited by ČIA, DAKKS, IATF
- Trainings – open and dedicated

TÜV NORD Czech – focused on Quality / short intro



TÜV NORD from inside – „hidden factory”:

- Qualified personel – continuos monitoring
- Verified Competences – ČIA, SÚJB, ČEZ, TNG...
- Certified personel and methods of testing -ČIA
- Innovative solutions & technics – TNG, clients
- New technology implementation - TNG
- Research & development for new methods - TNG
- Innovation and AI – TNG
- QMS, ISMS – internal TN audits

... we know how you feel

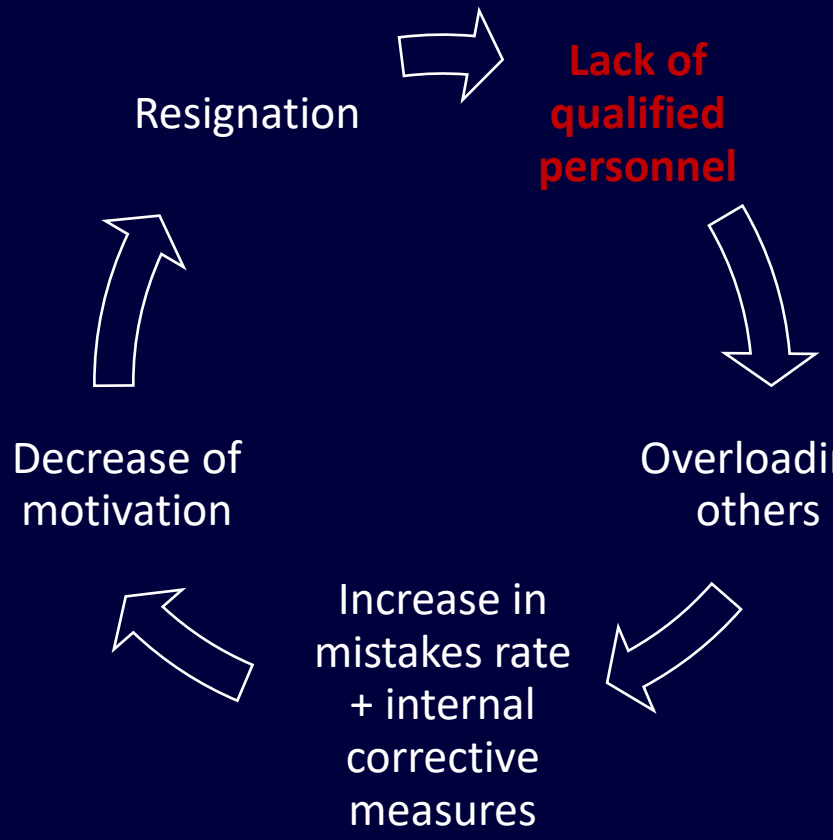
50+ **ManDays spent by external auditors in our premises / year (ČIA, SÚJB, ČEZ, TNG...)**

40+ **External auditors in our premises / year**

TÜV NORD Czech – Lessons learned

Our power and asset even in ages of AI development are **PEOPLE!**

The main challenge esp. in field of inspections:



TÜV NORD Czech – Lessons learned

We had to **STOP** it!

- Organisational structure changes inside the company
- Process mapping, defining roles and responsibilities
- Logistics and utilisation planning – to increase our efficiency
- Monitoring improvement
- Investments
  - Training

2023	806 888 Kč
2024	1 674 413 Kč

107 %

- Hiring

Triple increase in number of employees / 17 per year

(total nr. 127)

Increase of number of externs

TÜV NORD Czech – Lessons learned

Artificial Intelligence is learning from all of us...

We would like to thank all of you – you are our best teachers!

Thanks that your share your knowledge, experience, research, innovations

...we share ours

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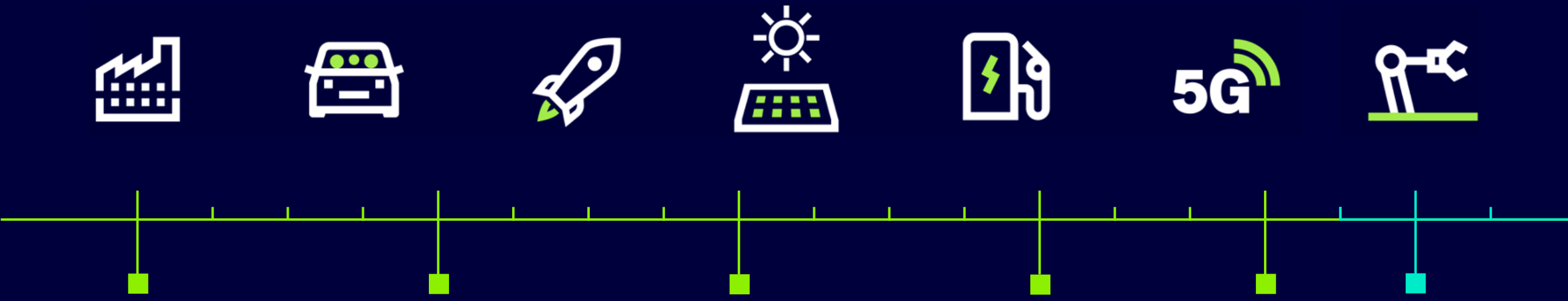
Navigating the AI landscape

Dr. Irina Fiegenbaum | TÜV NORD GROUP | 26.11.2024

The safety of people and technology

We have been ensuring global safety every day for over 150 years.



1860 Industry 1.0

1900 Industry 2.0

1940

1980 Industry 3.0

2010 Industry 4.0

2025 Industry 5.0

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The safety of people and technology

We have been ensuring global safety every day for over 150 years.

2010
Industry 4.0

2020
Testing AI

2023
TN GPT

2025
Industry 5.0

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Artificial intelligence

Significance for us as TÜV NORD GROUP

Increased efficiency

Automation and optimisation of routine tasks (e.g. completeness check; rule violations)

Data analysis

Analysing data, pattern and trend recognition, e.g. for business decisions

Customer interaction

Increasing customer satisfaction through AI-based chatbots (including permanent availability through "Sophie")

Process optimisation

Optimisation of business processes (including supply chain management and production processes)

Innovation

Machine learning/AI supports innovation management

Risk management

Data analysis for risk identification (including market changes and crises)

Operational use of AI in the TNG

Selected examples

BU Mobility

voize

Chatbot Sophie

autolytic

DRACI

infomaxx

BU People & Empowerment

Avatar-based tutorials

3spin learning

Learning with VR/AR and AI

BU Industry / BU Energy & Resources

Assessment of of radioactive residual materials

DMT Safeguard

Wind turbines (damage analysis)

AI roadmap / AI ideas Campaign / Workshops on AI solutions

BU Digital & Semiconductor

gsi global surface intelligence

"Counting trees"

"AI checks AI"

PRECEDER

"Prediction of radiation damage"

BU Certification

Conformity testing

Digital assistant

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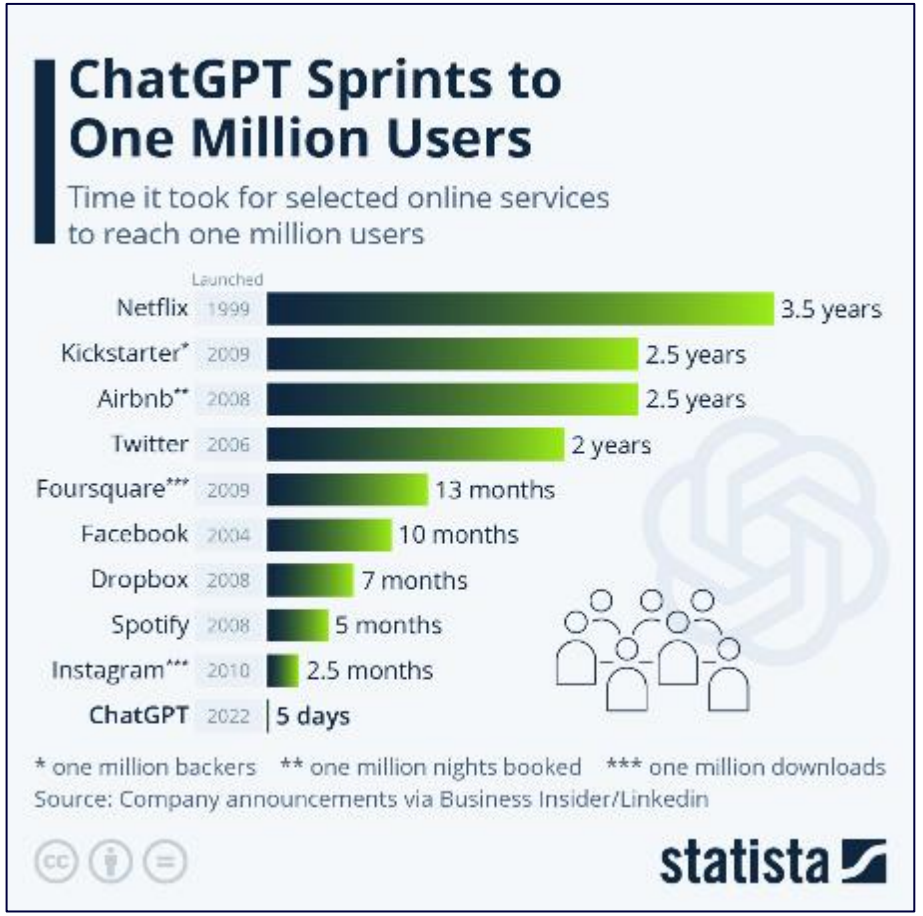
Example: TÜV NORD GPT

Our secure response to ChatGPT

Dr. Irina Fiegenbaum | TÜV NORD GROUP | 26.11.2024

ChatGPT and its hype

One million users within 5 days



OpenAI collects and retains user data from ChatGPT interactions

Best Practices for Users

- Avoid sharing sensitive personal information with ChatGPT
- Opt out of data sharing for model training where possible
- Carefully review AI-generated content before sharing or using it elsewhere
- Report any concerning or unethical AI responses to OpenAI
- Stay informed about AI safety research and best practices

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Public vs. private ChatGPT

public ChatGPT

- ✗ Expensive individual licences
- ✗ No safety control
- ✗ No GDPR conformity
- ✗ Training of public knowledge
- ✗ No corporate branding

TÜV NORD GPT

- ✓ IT availability and cost control: Automated operation, measurement and control of our IT services
- ✓ Control of data protection: GDPR protects our company value
- ✓ Security control: The virtual private network protects our internal data traffic
- ✓ Control of the corporate identity: Customised UI with corporate branding
- ✓ Customised use cases: e.g. chat with own PDF

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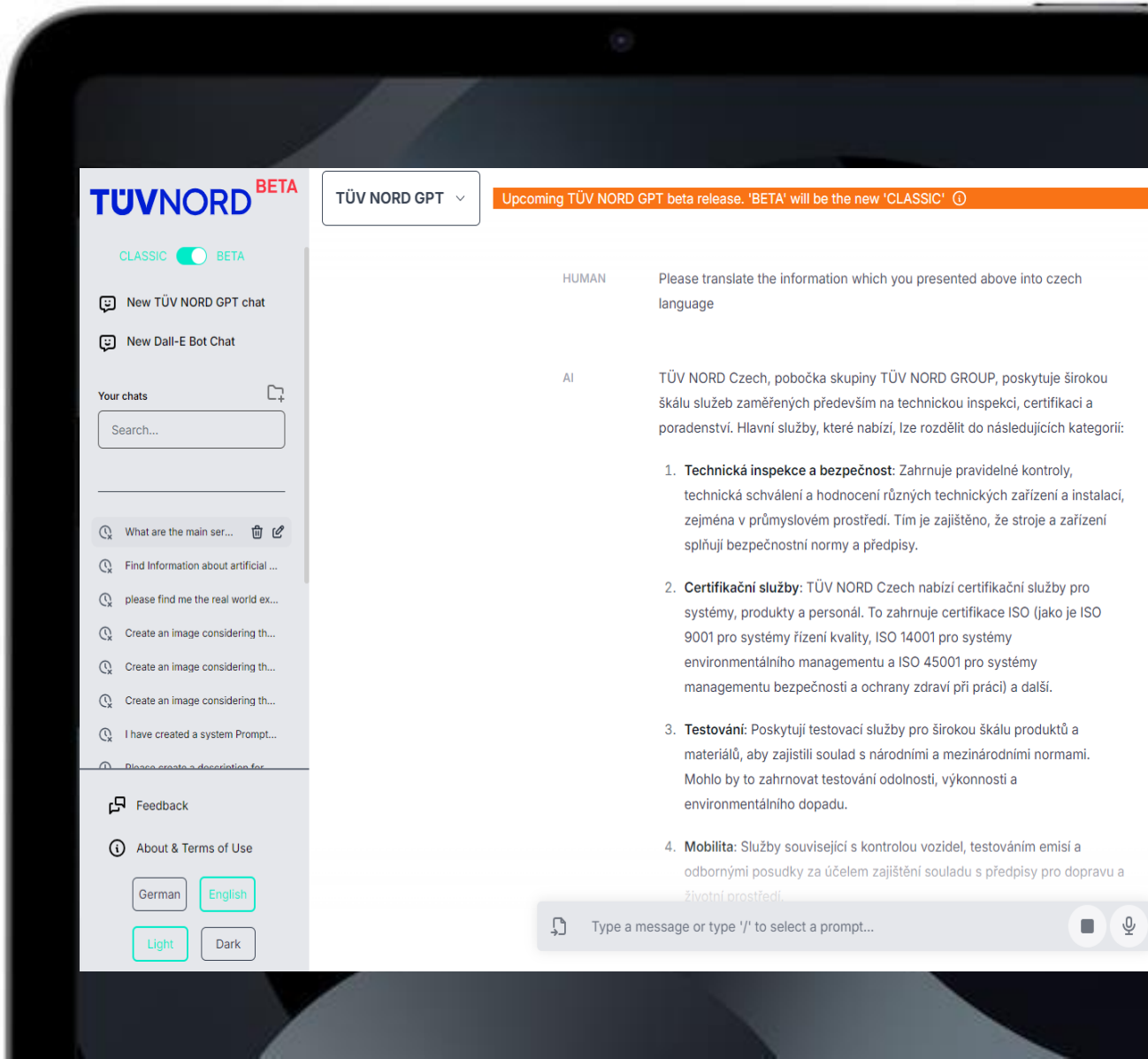
TÜV NORD GPT - Our knowledge assistant with AI

Function and application:

- Access to world knowledge
- Access to TÜV NORD knowledge: application orientated
- GDPR-compliant ("hosted" in Europe)
- No (training) data to OpenAI
- Image generation with DALL-E



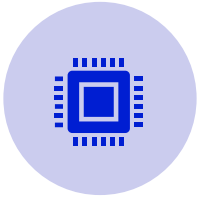
DSGVO: General Data Protection Regulation

What did we learn in AI projects?

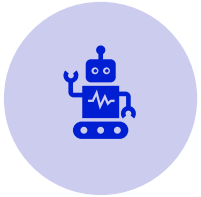
Many AI projects fail due to a lack of clear objectives and strategic alignment with business goals. Often focus on technology rather than specific problems -> focus on use cases and measurable objectives.

Unrealistic expectations: AI can solve it all and fast -> Implementation of AI is a long transformation project and is not a quick fix.

Data quality issues lead to erroneous outputs and undermine credibility of AI solutions -> do your homework first, ensure the data is there, accessible and reliable.



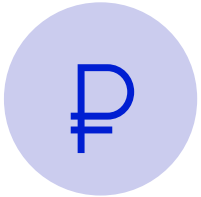
Ignoring the user: focusing on technical implementation ignoring the needs of the user - > involve user early, implement user-centric design.



Integration complexities: legacy infrastructure can hinder compatibility -> ensure the IT basis is there to implement AI solutions.

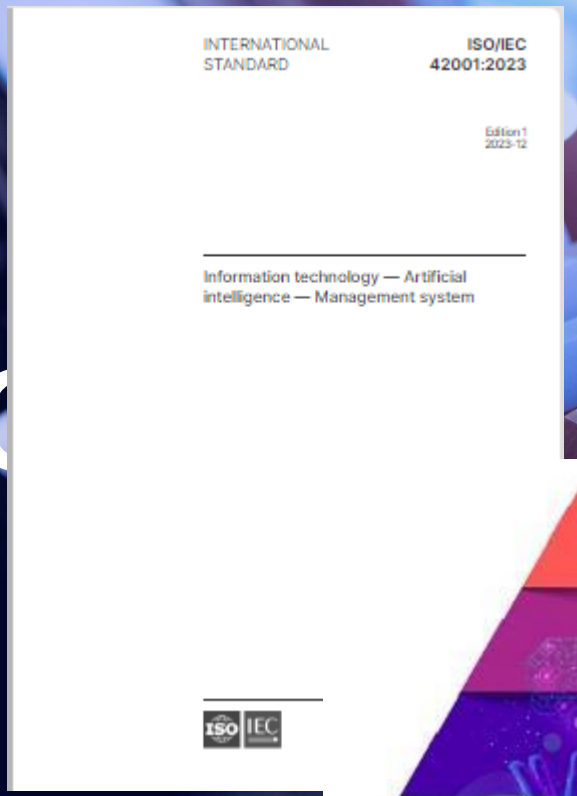
Inadequate testing and validation: rushing AI deployment will lead to quality loss -> take time for testing, validation and ensuring safety.

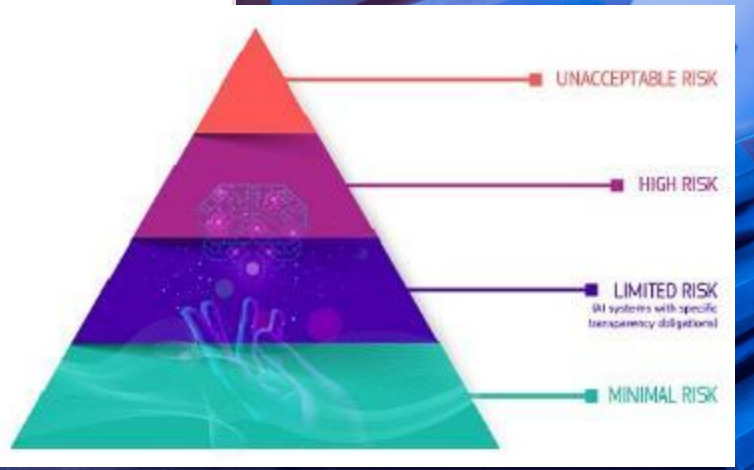
Lack of change management can lead to resistance and underuntilisation of AI solutions -> effective change management increasses user acceptance.



Costs and ressources: a lot of hidden costs as well as lack of qualified personnel -> solution is still to be found.

Is AI also subjec to quality control?





Source: European Commission Digital Strategy. (n.d.). Regulatory Framework for AI

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Most common AI quality concerns

Data Quality and Integrity: AI systems rely heavily on data. Poor quality, incomplete, or biased data can lead to inaccurate or unfair outcomes.

Model Accuracy and Reliability: AI models must be accurate and reliable – they should perform well under various conditions and do not produce erroneous results.

Ethical and Bias Concerns: AI systems can inadvertently perpetuate or amplify biases present in the training data.

Security and Privacy: AI systems often handle sensitive data, making them targets for cyberattacks.

Transparency and Explainability: AI decisions can sometimes be opaque, making it difficult for users to understand how conclusions are reached.

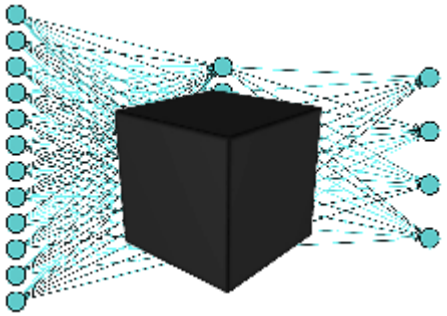
Risk of AI

„It‘s not a Bug, it‘s a Feature“

```
# ImageNet labels
decode_predictions = tf.keras.app
# Helper function to preprocess
def preprocess(image):
  image = tf.cast(image, tf.float
  image = tf.image.resize(image,
  image = tf.keras.applications.
  image = image[None, ...]
  return image
```

Common Systems

(traceable, clear rules, source code, etc.)



AI is a „Black Box“

(<u>What</u> has been learned? lack of robustness, etc.)

„Cat“
98,2%

„Banana“
99,1%

Our answer to those: Safe & Secure AI

Dr. Irina Fiegenbaum | TÜV NORD GROUP | 26.11.2024

Making AI safer

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TÜV NORD & TÜV AI.Lab

Charging the TÜV brand with AI

AI as a tool for improving internal work flows

Our focus in the AI.Lab

AI as a test object

AI as a testing tool

"The company's main field of activity will be the development of recommended courses for action and auditing processes in connection with the AI-Act“

(JV-Agreement, Par. 5.3.1)

"The object of the company is the research and development of intellectual property and know-how (such as best practices and certification processes) for statutory conformity assessment activities in connection with artificial intelligence"

(Shareholders‘ agreement, Par. 2.1)

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VISION

Europe becomes a hotspot for trustworthy & secure AI

TÜV companies become globally leading AI testing organizations

TÜV AI.Lab as a key enabler of trustworthy AI in Europe

Time is running…

The Future Path of the AI Act

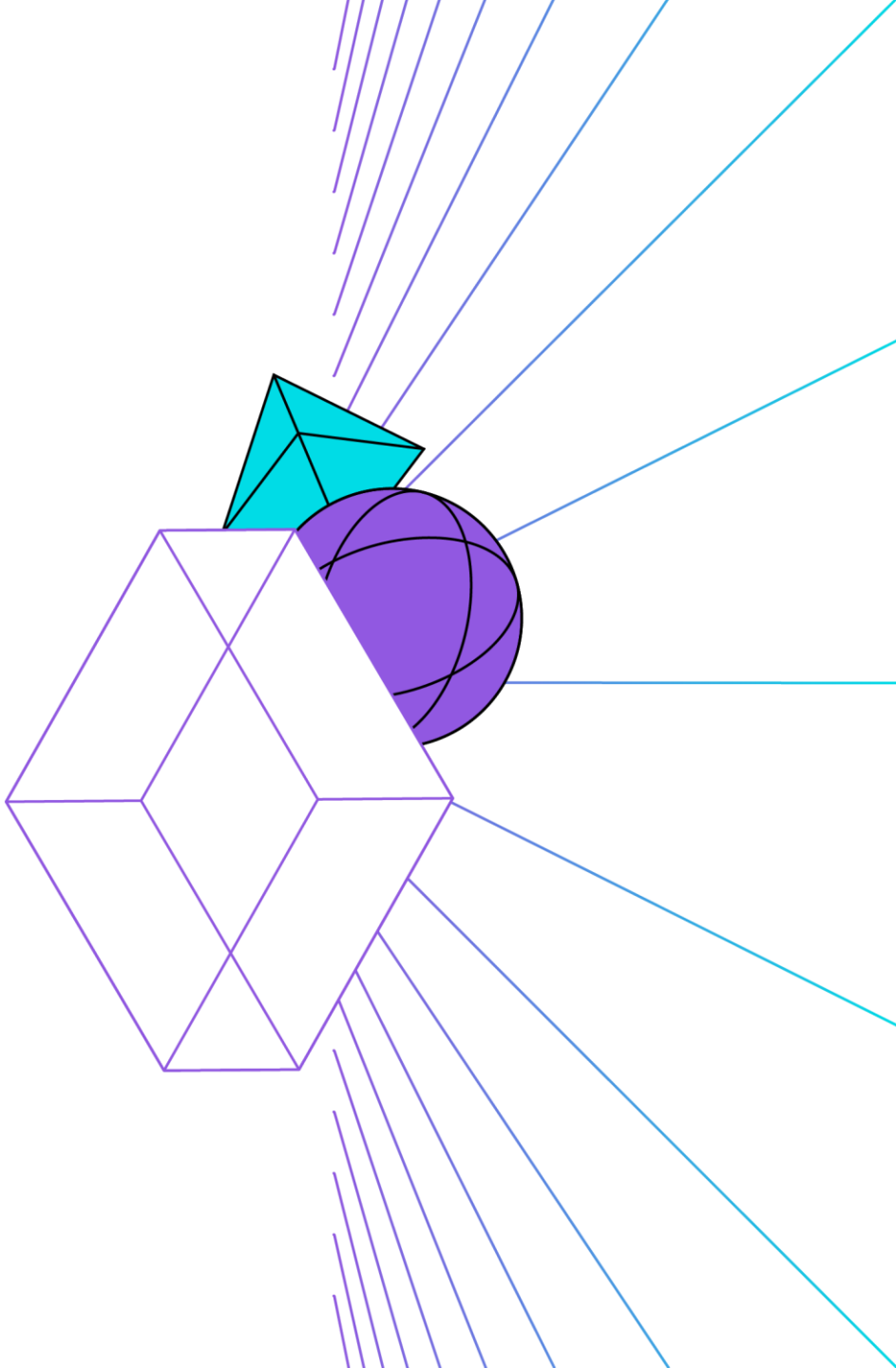
2024 Aug 1st — **Entry into force**

2025 Feb 2nd — **Prohibitions apply**

2025 Aug 2nd — **GPAI Obligations**

2026 Aug 2nd — **Entire AI Act applies + High-risk Area of Use**

2027 Aug 2nd — **High-risk Sectoral Regulation apply**



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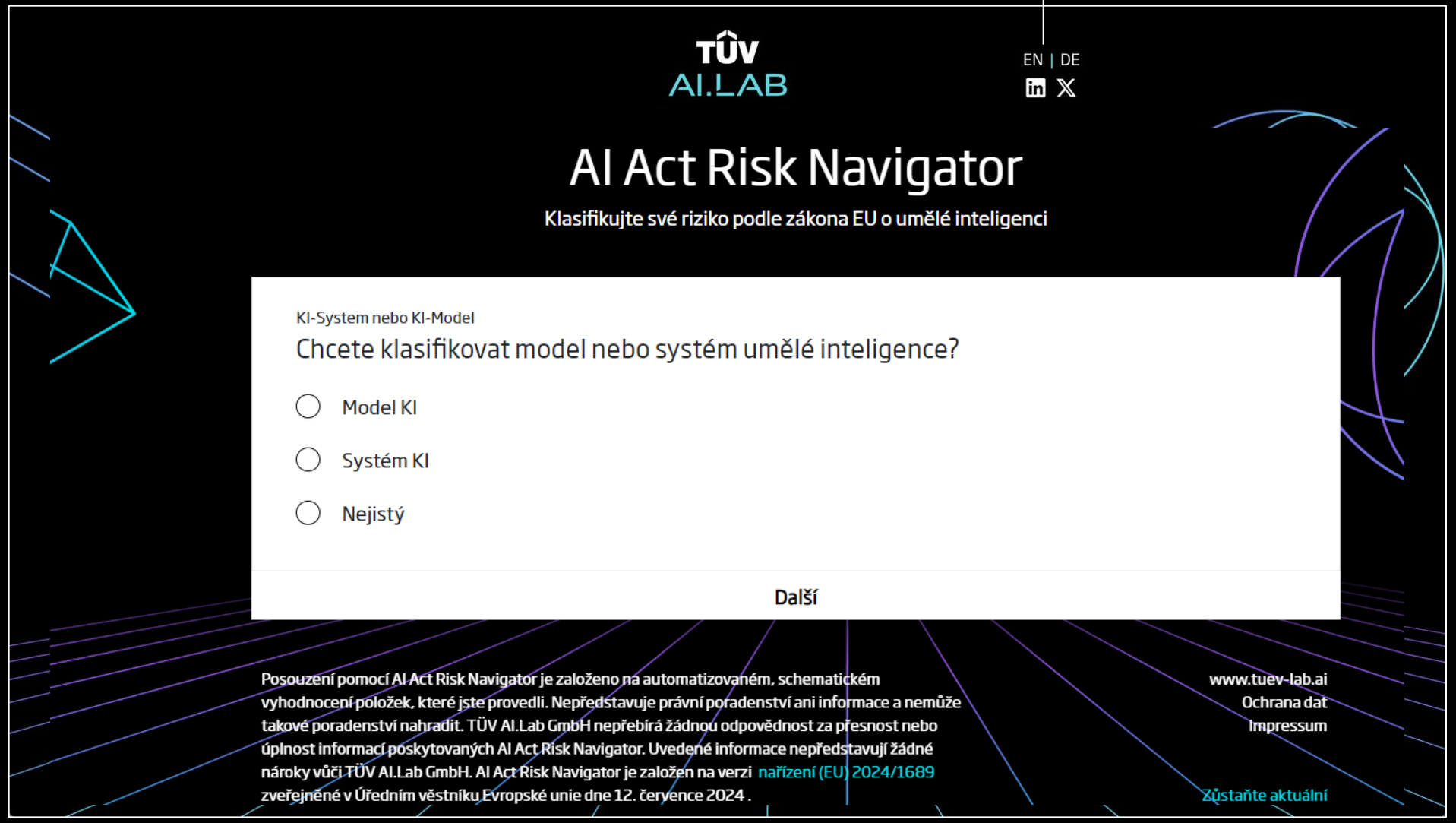
At your service: AI Act Risk Navigator

EN version available: 11/24

tuev-risk-navigator.ai

Free and low-threshold classification tool for the risk classes of the AI Act

Have a look:



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Insight and outlook AI

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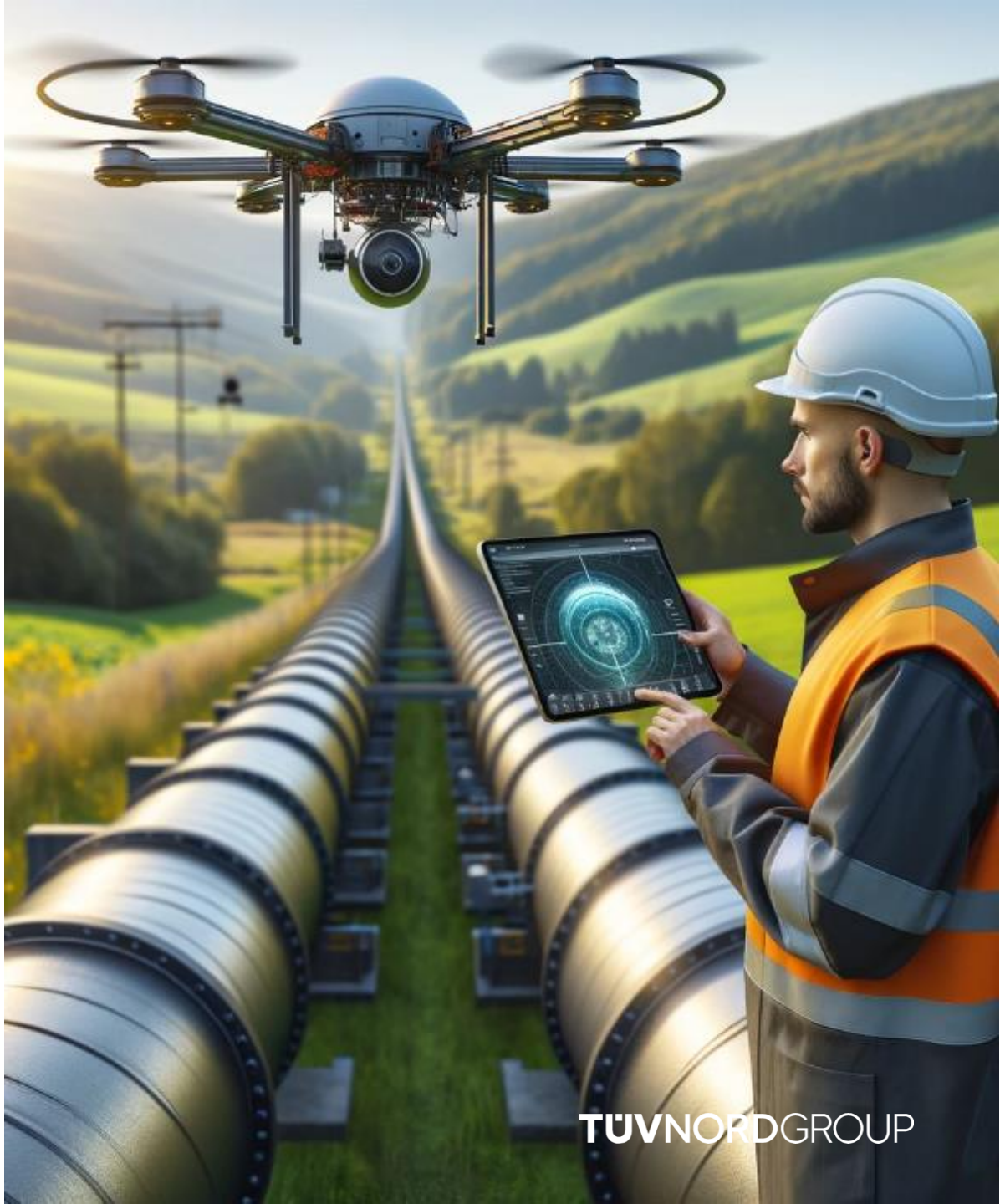
Artificial intelligence is gradually becoming an integral part of the TÜV NORD GROUP and will fundamentally change both external and internal processes.

- Future role of AI as an **assistant and "co-pilot"**
- Use of AI will **increase customer benefits** and make a significant contribution to **reducing bureaucracy**
- The interaction between **humans and AI** will be the decisive success factor
- Thorough TÜV AI.Lab we are at the forefront of implementing social and regulatory requirements, (e.g. EU AI Regulation) in testing criteria and processes, and of supporting the development of standards for **testing safety-critical AI applications**.




Q&A