



# IS ARTIFICIAL INTELLIGENCE A TIME AND COST SAVER, A SECURITY AND EFFICIENCY TOOL FOR PORTS OR A RISK FOR SOCIETY?

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ESPO – Paris Conference  
Date : 25 April 2024

# Agenda

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Some use cases in the Seaport sector

Foundation models, GPT and Generative AI

The European AI Act

Q & A



# Use cases



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# How can AI deliver value for the seaport sector ?



Increase  
Activity

Reduce Costs

Improve  
Operational  
Efficiency

Identify  
Trends &  
Correlations

# What do the analysts / specialists see as trends ?



## Maritime & ports innovation trends :

- Ship location prediction
- Scheduling shipments optimization
- Dynamic pricing models for container shipping
- Port operations optimization

(source Nexocode June '22)

## GenAI possibilities in shipping industry :

- Port operations
- Shipping & logistics
- Maritime safety
- Communication & navigation

(source Netsol '24)

## Top 3 AI trends in seaports:

- Optimising Port Operations
- Berth Management
- Predicting Managing Congestion

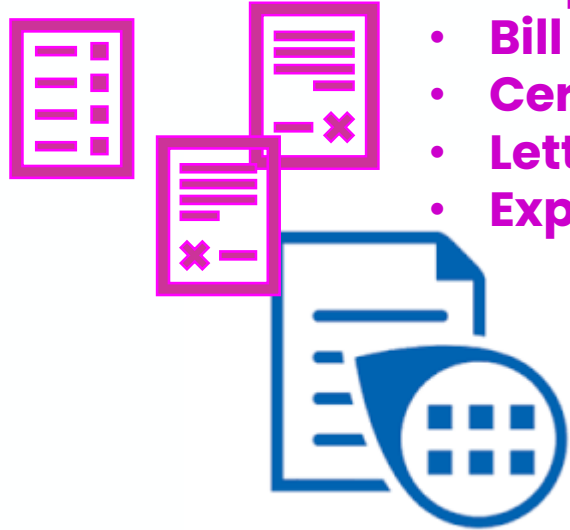
(source innovez Sept '23)

## ML opportunities in ports:

- Automate standard vessel operations
- Fuel economy / optimisation
- Route planner optimizer
- Cargo & maintenance process optimisation

(source Medium '23)

# Extracting content, information, and references from any documents



- **Commercial invoice**
- **Shipping list**
- **Bill of loading**
- **Certificate**
- **Letter of credit**
- **Export & import licence**

Forms Recognizer /  
Intelligent document  
processing



Can handle free text, tables in documents, handwritten documents, pdfs, typed prescriptions, etc.



# A day in the life of a CFO at a seaport – CoPilot assistance

8:00 AM

Clarisse begins her day in Excel looking at the latest estimates for a new IBA product. she uses Copilot to filter the data to get the view he wants.



Copilot in Excel

**Sort the data** by product feature and then filter out the Priority 2 features.

4:00 PM

Clarisse heads back into Excel to update the acquisition numbers with the latest what-if scenarios and create some charts to go into the business planning presentation.



Copilot in Excel

**What is the impact** of doubling the IT integration budget on the revenue per month?

9:30 AM

she later meets with the concerned manager and IT to discuss reporting requirements updates from the sales organization. she asks Copilot to summarize the requirements.



Copilot in Teams

**Summarize the meeting** and be sure to list all the reporting requirements that were mentioned.

2:00 PM

Clarisse needs to catch up on a chat she started in the morning. she asks Copilot to summarize the thread (history)



Copilot in Teams

**Summarize the thread** calling out where my name was mentioned and any action items for me.

10:00 AM

Clarisse finally gets to her main project for the day and reviews the due diligence information on a potential acquisition target. she asks Copilot to create a summary.



M365 Chat

**Summarize the information** in the Due Diligence report and the Acquisition preparation dossier of the concerned Seaport

11:00 AM

After creating an overview of the acquisition in Word, she asks Copilot to turn the document into a presentation for the business development team.



Copilot in PowerPoint

**Create a presentation from** [Word document link to the acquisition overview.docx]



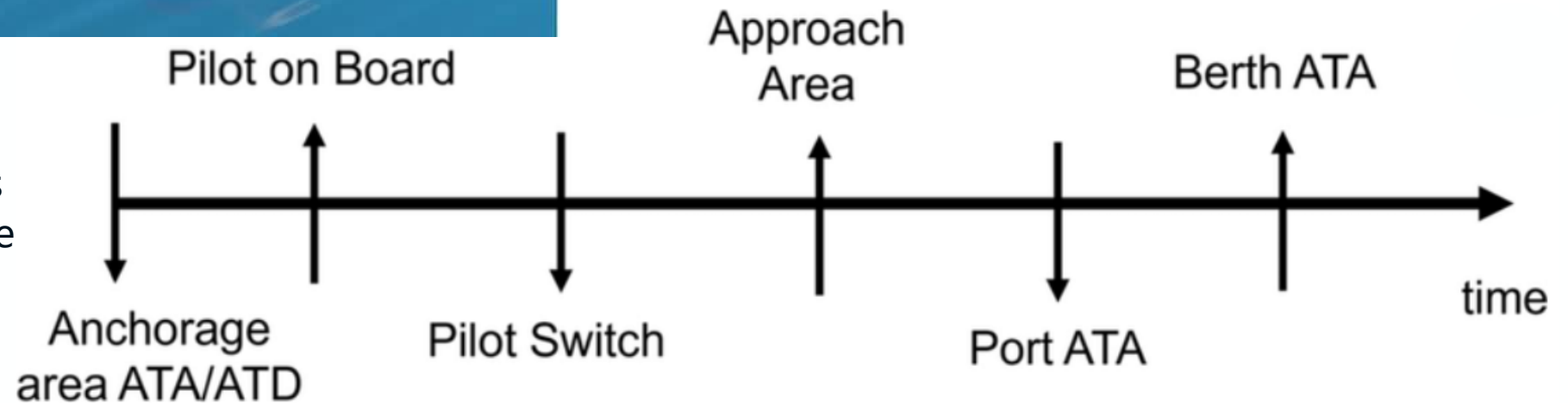
Clarisse

# Vessel arrival time prediction with AI to improve berth planning



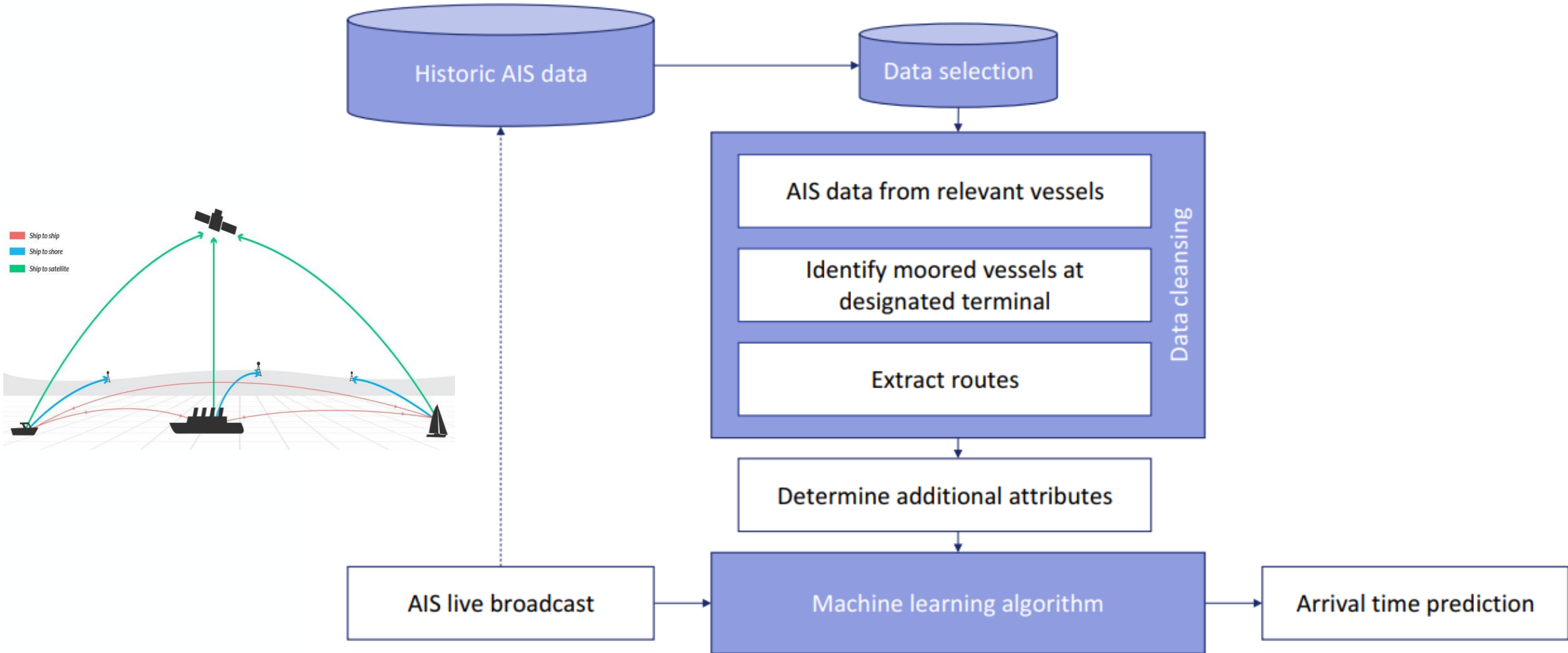
Data-driven optimization for berth allocation. The aim is to derive conflict-free vessel assignments at the quay of a terminal, taking into account uncertainty regarding the actual vessel arrival times which may result from external influences as, e.g., cross wind and sea current. One can apply ML techniques such as linear regression, kNN or a neural network for vessel arrival time prediction.

Theoretical timeline for vessel arrival with events labels. ATA is Actual Time of Arrival

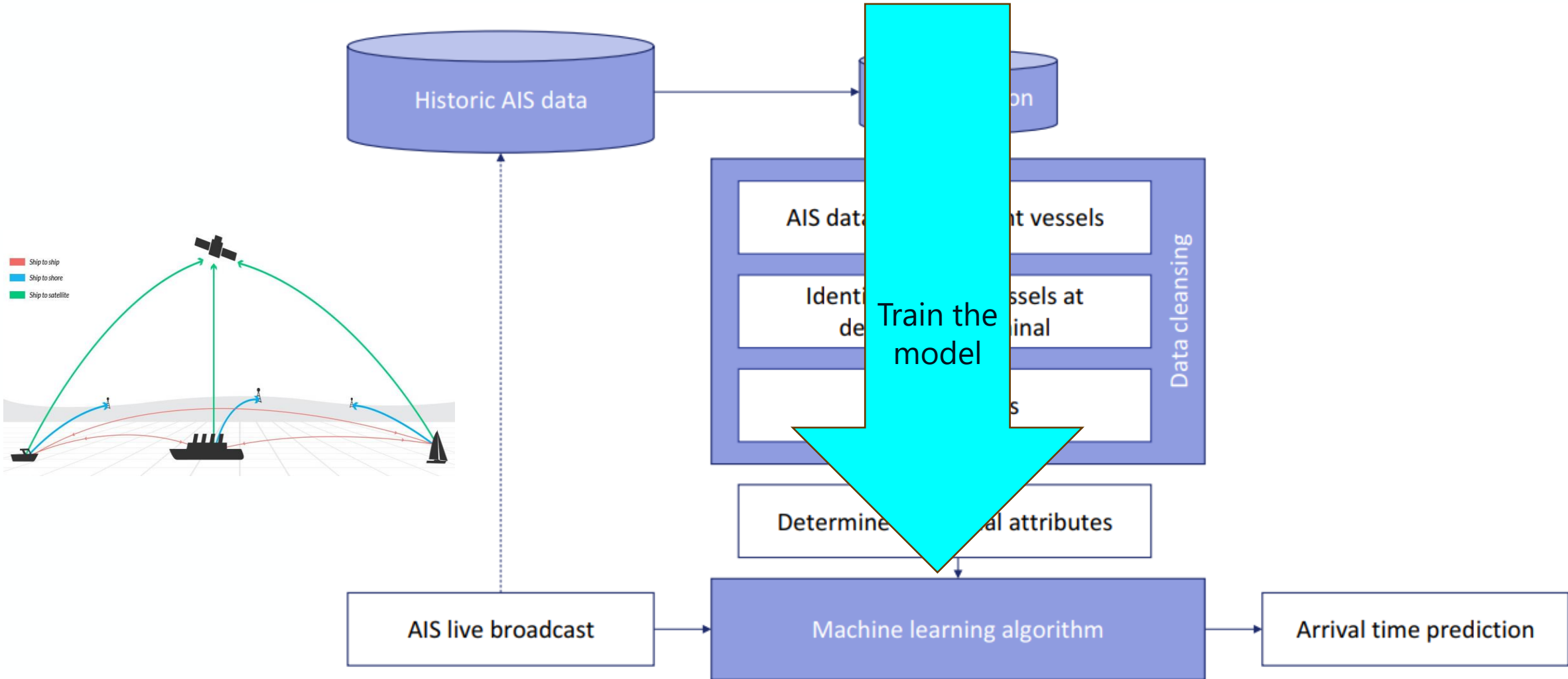




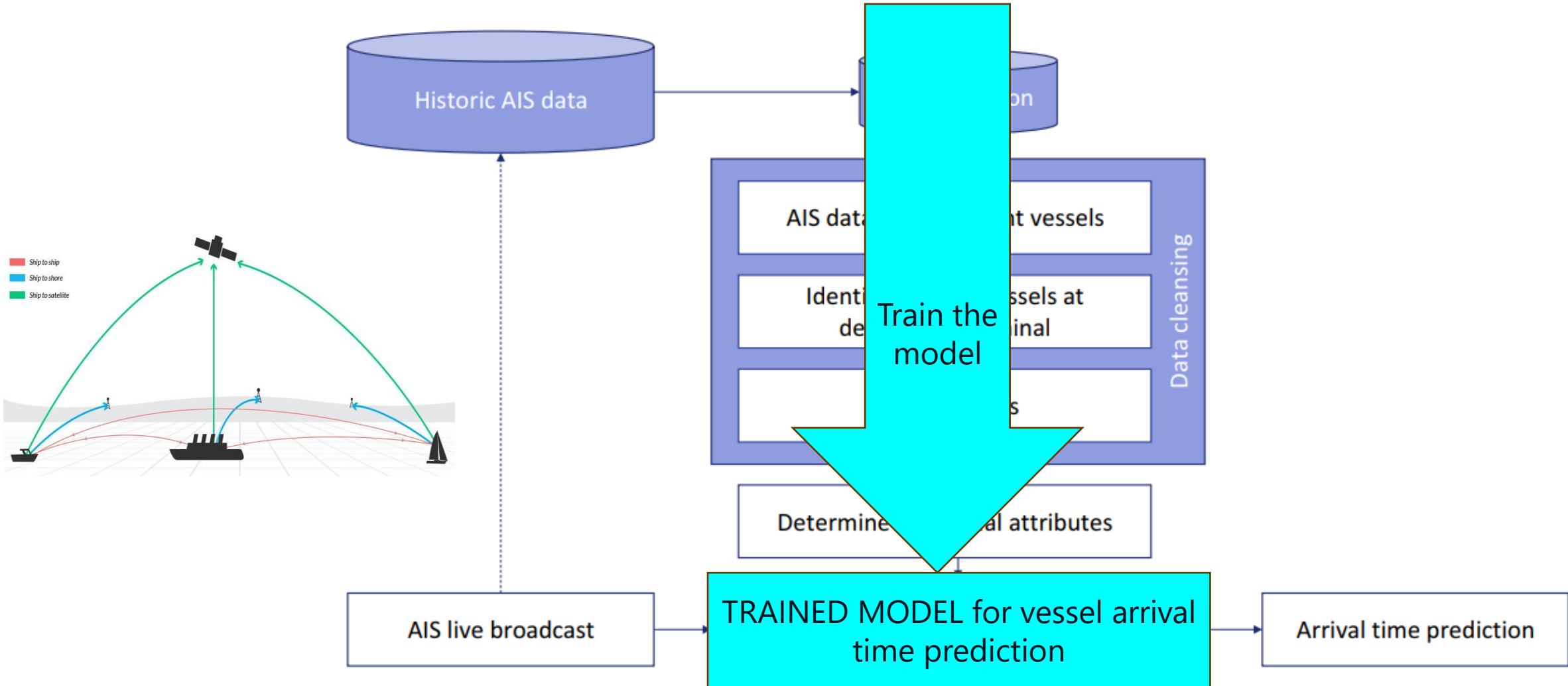
# Vessel arrival time prediction with AI to improve berth planning



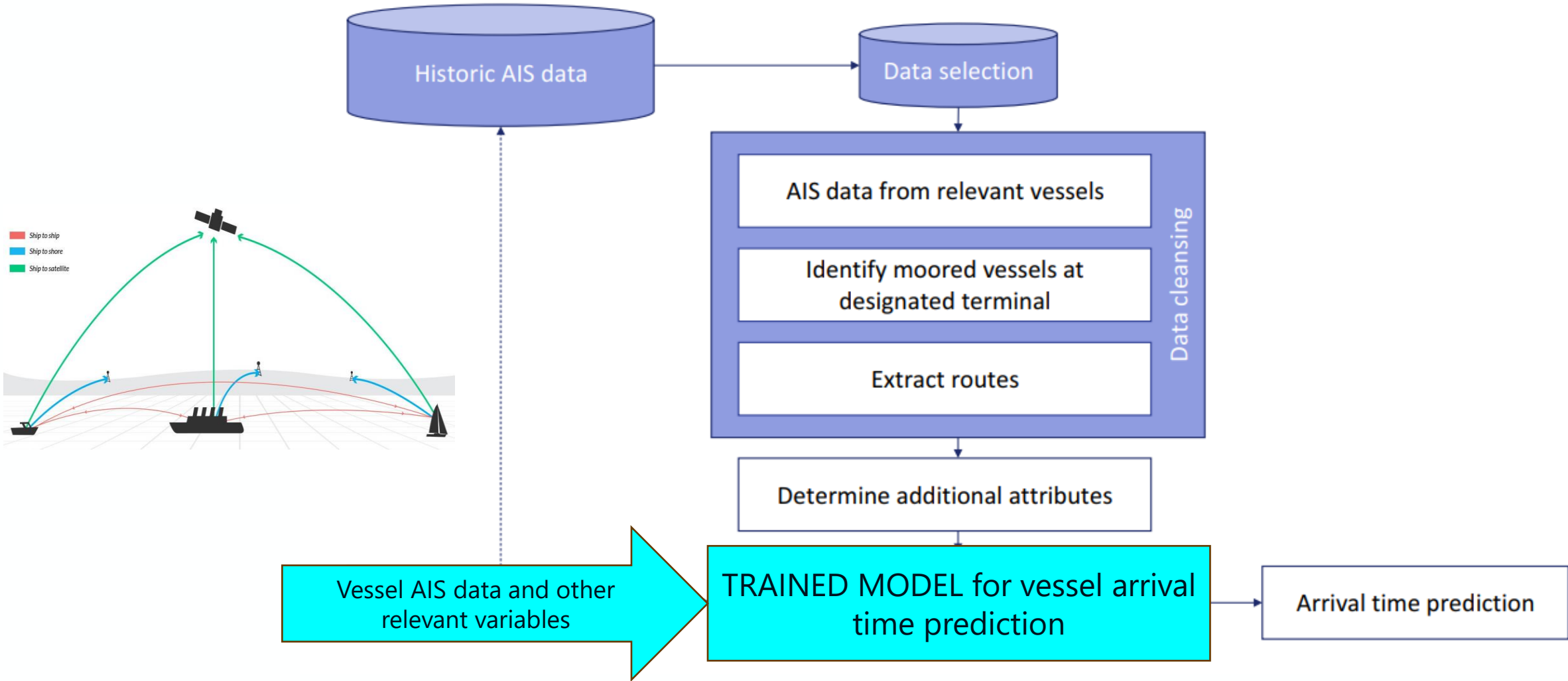
# Vessel arrival time prediction with AI to improve berth planning



# Vessel arrival time prediction with AI to improve berth planning



# Vessel arrival time prediction with AI to improve berth planning



# AI & GenAI applied to some business processes

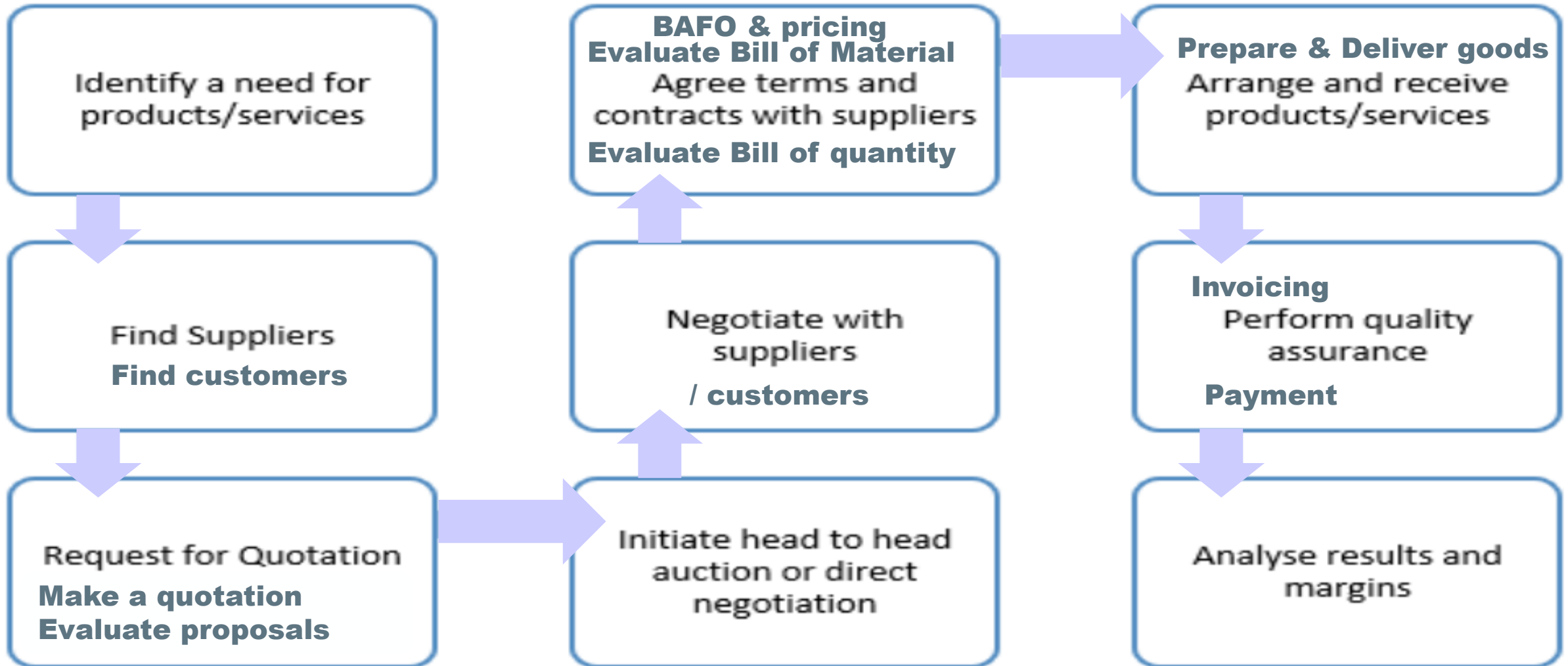
PROCUREMENT PROCESS

CONTRACTING & LEGAL PROCESS

NEGOTIATION PROCESS

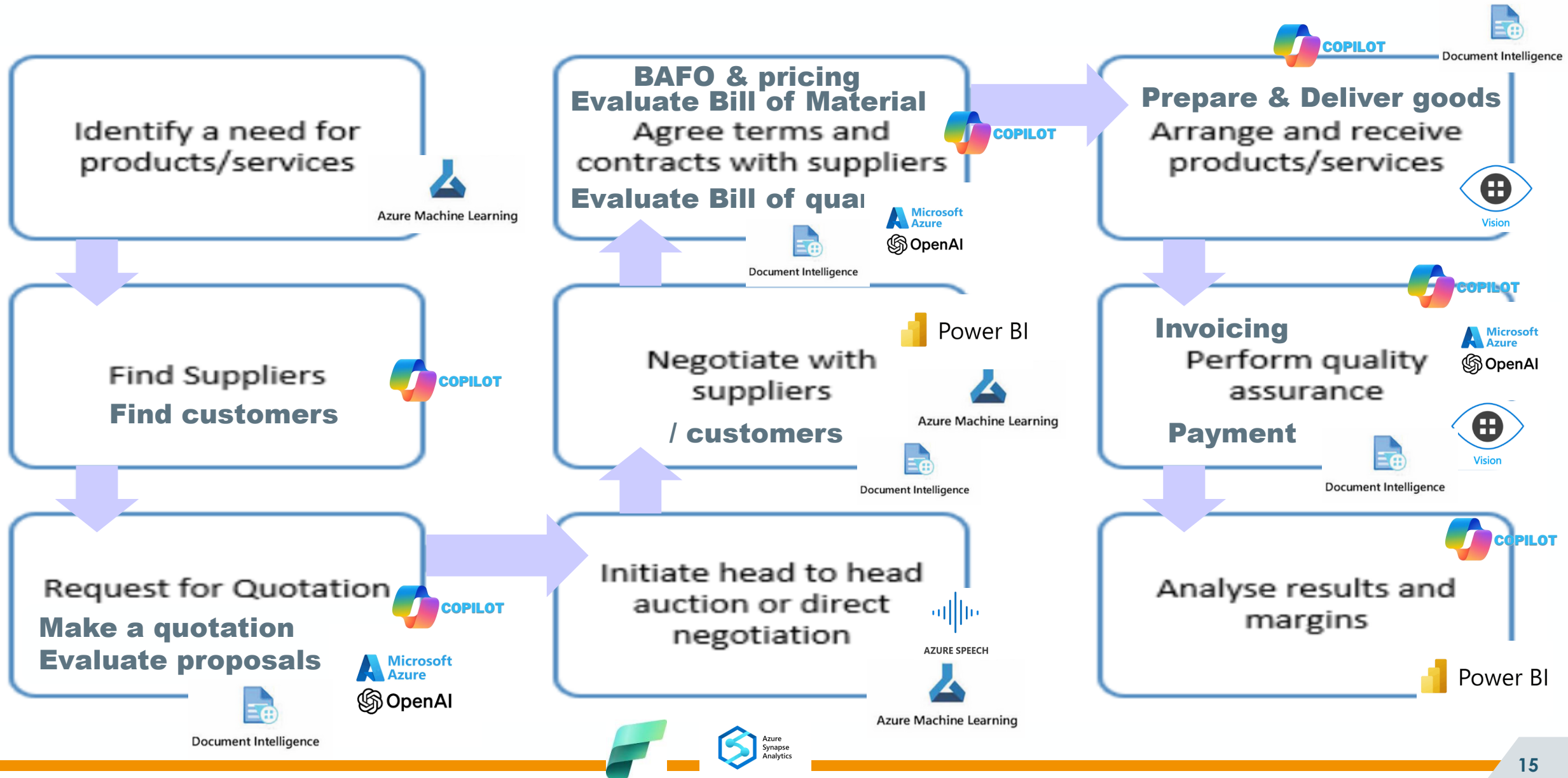
SALES & QUOTE PREPARATION PROCESS

# AI & GenAI applied to some business processes



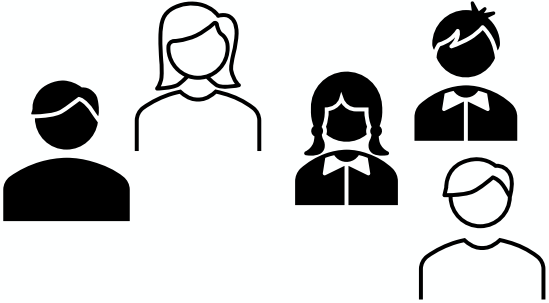


# AI & GenAI applied to some business processes



# Unburden HR with a self service chat (GPT)

I travelled abroad, how do I get reimbursed for my hotel expenses?

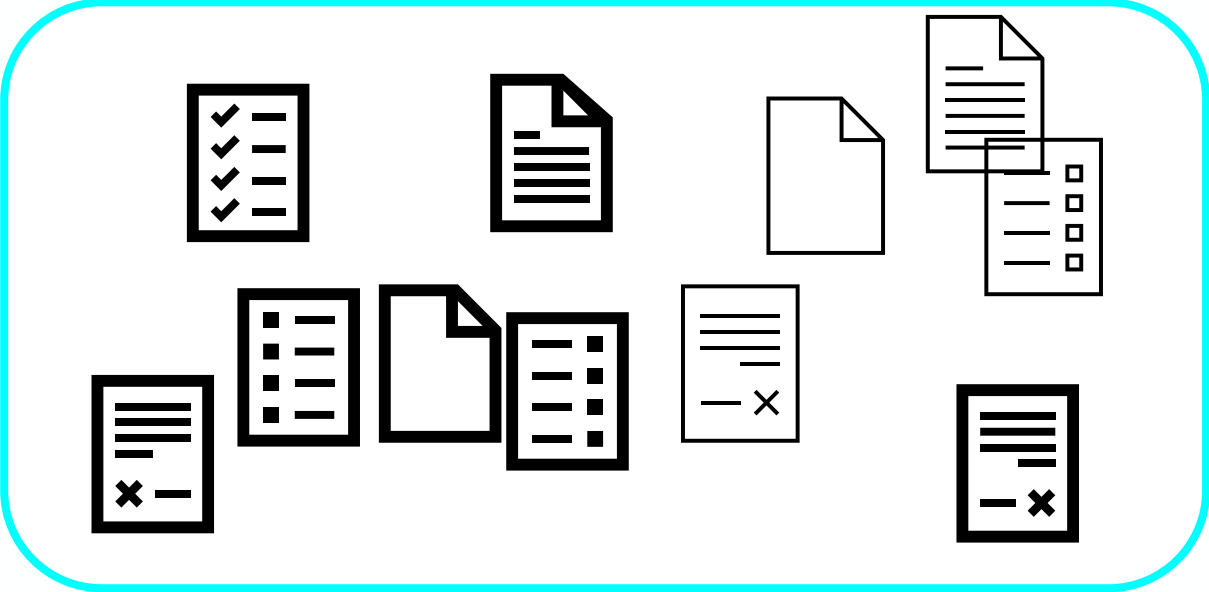


What is the procedure for maternity leave?



I'm looking for the latest template for a job description

All internal HR documents stored on the Intranet, or SharePoint or other document management system



# Better ESG reporting & insights with AI

The image shows a screenshot of an ESG reporting dashboard. On the left, there are filters for reporting year (2018-2023), accounting method (Location Based, Market Based), and organizational hierarchy. The main dashboard displays 'Emissions (mtCO<sub>2</sub>e)' for the reporting period January 1 - December 31, with a total of 2,165,285. Below this, it breaks down emissions by scope: Scope 1 (1,048,015.96), Scope 2 (291,541.49), and Scope 3 (825,727.19). A line chart at the top shows emissions from 2018 to 2021. A navigation menu on the left includes Home, Analytics (Executive dashboard, Emissions insights, Water insights, Waste insights, Reporting, Scorecards & goals, Intelligent insights), Data, and Calculations (Models, Calculation profiles, Factor libraries, Allocation profiles). A large image of a wind turbine is visible in the background. In the foreground, a large black icon of a document with horizontal lines is overlaid. On the right, a chat interface shows a user asking 'What are Fabricam's carbon reduction goals?' and an AI-generated response: 'Reduce supply chain emissions by 30% within the next five years by working closely with key suppliers to optimize transportation methods, improve energy efficiency in manufacturing processes, and encourage the adoption of renewable energy sources throughout the supply chain.' Below the response is a disclaimer 'AI-generated content may be incorrect' and a 'View prompts' button. A 'Copy' button is visible in the top right corner.

**Emissions**  
Reporting period: January 1 - December 31

**Filters**

Reporting year

- 2023
- 2022
- 2021
- 2020
- 2019
- 2018

Accounting method

- Location Based
- Market Based

Organizational hierarchy

- (unassigned)
- Contoso Corp

**Emissions (mtCO<sub>2</sub>e)**

2,165,285

Scope type

- Scope 1: 1,048,015.96
- Scope 2: 291,541.49
- Scope 3: 825,727.19

By source and scope | By org level and emissions source | By country / region | By organization unit | By facility

Home | Analytics | Data | Calculations

- Executive dashboard
- Emissions insights
- Water insights
- Waste insights
- Reporting
- Scorecards & goals
- Intelligent insights (p...
- Models
- Calculation profiles
- Factor libraries
- Allocation profiles (p...

What are Fabricam's carbon reduction goals?

Reduce supply chain emissions by 30% within the next five years by working closely with key suppliers to optimize transportation methods, improve energy efficiency in manufacturing processes, and encourage the adoption of renewable energy sources throughout the supply chain.

AI-generated content may be incorrect

View prompts

I'd like ci

# Better ESG reporting & insights with AI

**Copilot**

**Chat**

long haul (>= 2300 miles) (employee commuting), Air travel - medium haul (>= 300 miles, < 2300 miles) (business travel), Air travel - medium haul (>= 300 miles, < 2300 miles) (employee commuting), Air travel - short haul (< 300 miles) (business travel), and Air travel - short haul (< 300 miles) (employee commuting).

Air travel - long haul (>= 2300 miles) (business travel)

Air travel - long haul (>= 2300 miles) (business travel)

2300 miles) (business travel)

Air travel - medium haul (>= 300 miles, < 2300 miles) (employee commuting)

Air travel - short haul (< 300 miles) (business travel)

Show all on a page

AI-generated content may be incorrect

Ask a question about the data in this app, or ask for help finding for

ChatGPT

**Intelligent insights**

An outlier represents a record that's significantly different than others within the same context, helping you discover data quality issues or areas where action is needed.

**Microsoft Sustainability Manager**

**Document analysis**

Look for a document

ESG Report 2023

Documents

Upload new document

Fabricam ESG Report 2023  
1 January 2023 12:00PM

Document will expire in 24 hours after upload

**Our approach**

We believe that many of the most impactful solutions for addressing climate change are rooted in agriculture. It starts with the soil and ends in the sky, and we're committed to making it a part of our business - from production and transportation to sustainable environmental.

**Reducing and optimizing emissions**

Our primary focus is on reducing our own emissions, which we do through a combination of energy efficiency, renewable energy, and carbon capture and storage (CCS). We also work with our suppliers to reduce their emissions, and we encourage the adoption of renewable energy sources throughout the supply chain.

**Increasing new products and solutions**

We're committed to developing and launching new products and solutions that help our customers reduce their carbon footprint. This includes everything from energy-efficient lighting to smart irrigation systems, and we're constantly looking for new ways to help our customers become more sustainable.

**Scaling new markets and collaboration**

We're expanding our reach into new markets and working with our partners to create new opportunities for sustainable growth. This includes everything from new geographic markets to new business models, and we're committed to finding ways to work together to make a positive impact on the world.

**Supporting climate policy and collaboration**

We're committed to supporting climate policy and working with our partners to create new opportunities for sustainable growth. This includes everything from new geographic markets to new business models, and we're committed to finding ways to work together to make a positive impact on the world.

**and 2**

Renewable electricity around the world

Renewable electricity around the world

Target

215,000

**Document analysis**

**Copilot**

Show me carbon reduction goal targets for the sustainability reports provided.

Reduce supply chain emissions by 30% within the next five years by working closely with key suppliers to optimize transportation methods, improve energy efficiency in manufacturing processes, and encourage the adoption of renewable energy sources throughout the supply chain.

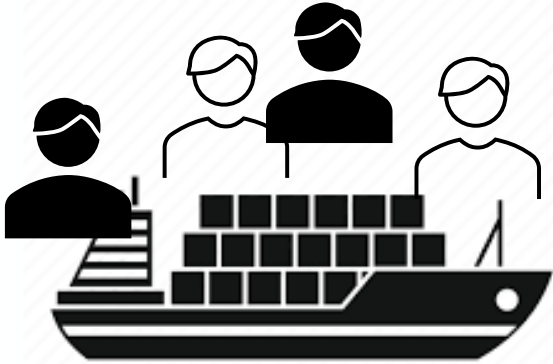
I'd like to circularity commitments for products at end of life.

Answer will go here...

Ask a question about the data in this app, or tell me what you are looking for

# Seaport chatbot for new arrivals/shippers

I have to register in your system, what is the procedure

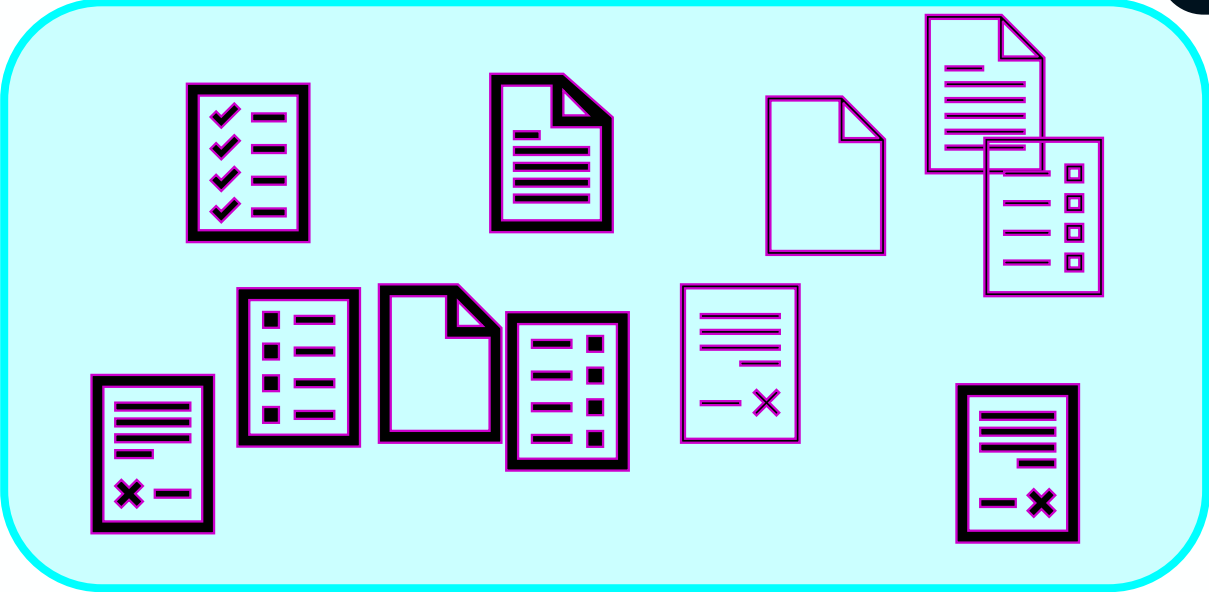


Where can I find my contact person related to working permit problem

What is the electronic procedure for invoicing



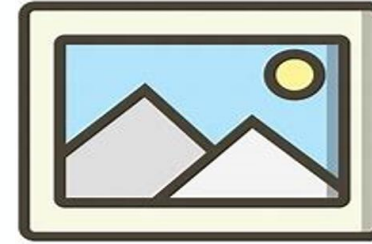
All related information about operations, administration, invoicing, departments, responsibilities, FAQ etc. of that seaport





# Safety & security – GenAI for images & video

Question: How many people are wearing personal protection (helmet)?



Answer: I count 4 people; 3 with helmet and 1 person not wearing any protection.





# Foundation models, GPT and Generative AI



ESPO – Paris Conference  
Date : 25 April 2024

## Machine Learning

### Deep Learning

### Generative AI

### Foundation models

## Machine Learning

A subset of AI that allows machines to learn from existing data and improve that data to make decisions or make predictions

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## Deep Learning

A machine learning technique in which layers of neural networks are used to process data and make decisions

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## Generative AI

Algorithms that use existing content to generate new content (text, image, sound, etc.)

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## Foundation models

It's a broad term to define AI models designed to produce a wide and general variety of outputs. They are capable of a range of possible tasks and applications, including text, video, image, or audio generation.

**Machine Learning**

**Deep Learning**

**Generative AI**

**LLM**

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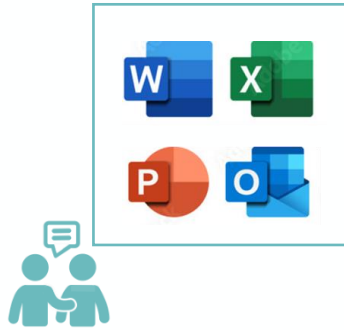
## **Large Language Models**

A type of foundation model that can perform a variety of natural language processing (NLP) tasks such as text generation, text summarization, text classification, text understanding and translation.

# GenAI helps & changes day-to-day working tasks



Your own  
sparring  
partner



A co-pilot in your office  
applications



A tailor-made assistant /  
improvement of work  
processes or  
applications

# The True Potential of Large Language Models

~~GPT = Knowledge~~ + Linguistic Reasoning



# The True Potential of Large Language Models

You see the **real potential** when you realize that GPT is a kind of **language reasoning** machine that (sort of) resembles **humans**.

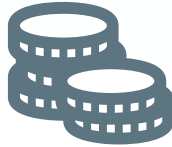
ChatGPT



Azure



Finance



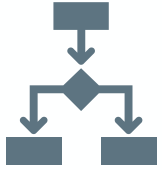
Legal



Invoicing



Operations



Today, you have to assume that **every knowledge process** in a company or organization can be **automated or reinvented** – to some extent – **with Large Language Models.**

Security



Contracts & subsidies



Communication



HR



Customer, citizen, patient service



Business Planning  
Guard scheduling,..



Logistics



# LLM / GPT can help in many areas

## Text Analysis & Editing

Grammar and punctuation, language translation, sentiment detection.

## Data Extraction

Create tables from text, extract keywords.

## Classification

Text Elements in Categories

## Summarizing

Understand text and meaning and be able to display key points in a structured manner.

## Content Generation

Generate text for various applications such as social media, blogs, but even writing scientific articles.

## Programming

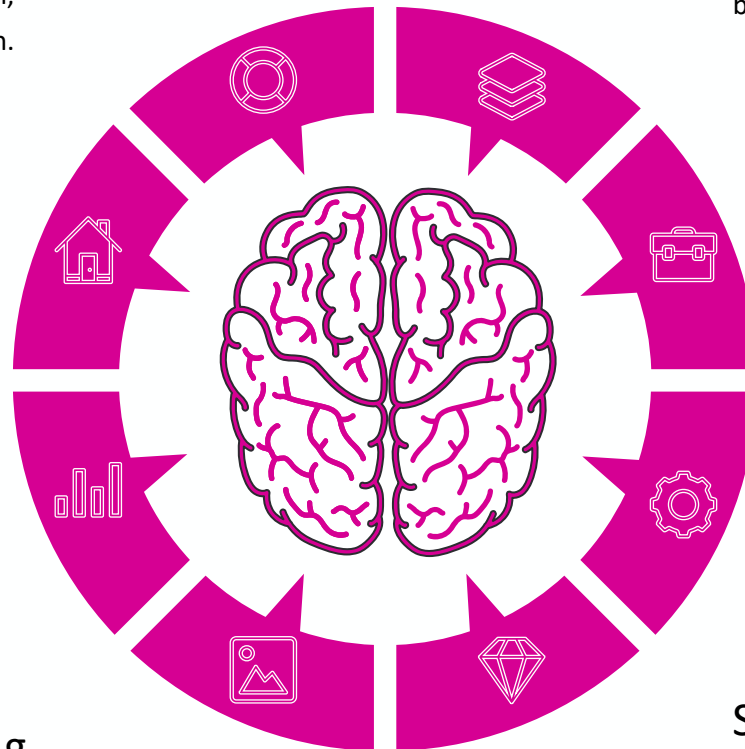
Create code, debug code, explain code in natural language, convert simple language to code.

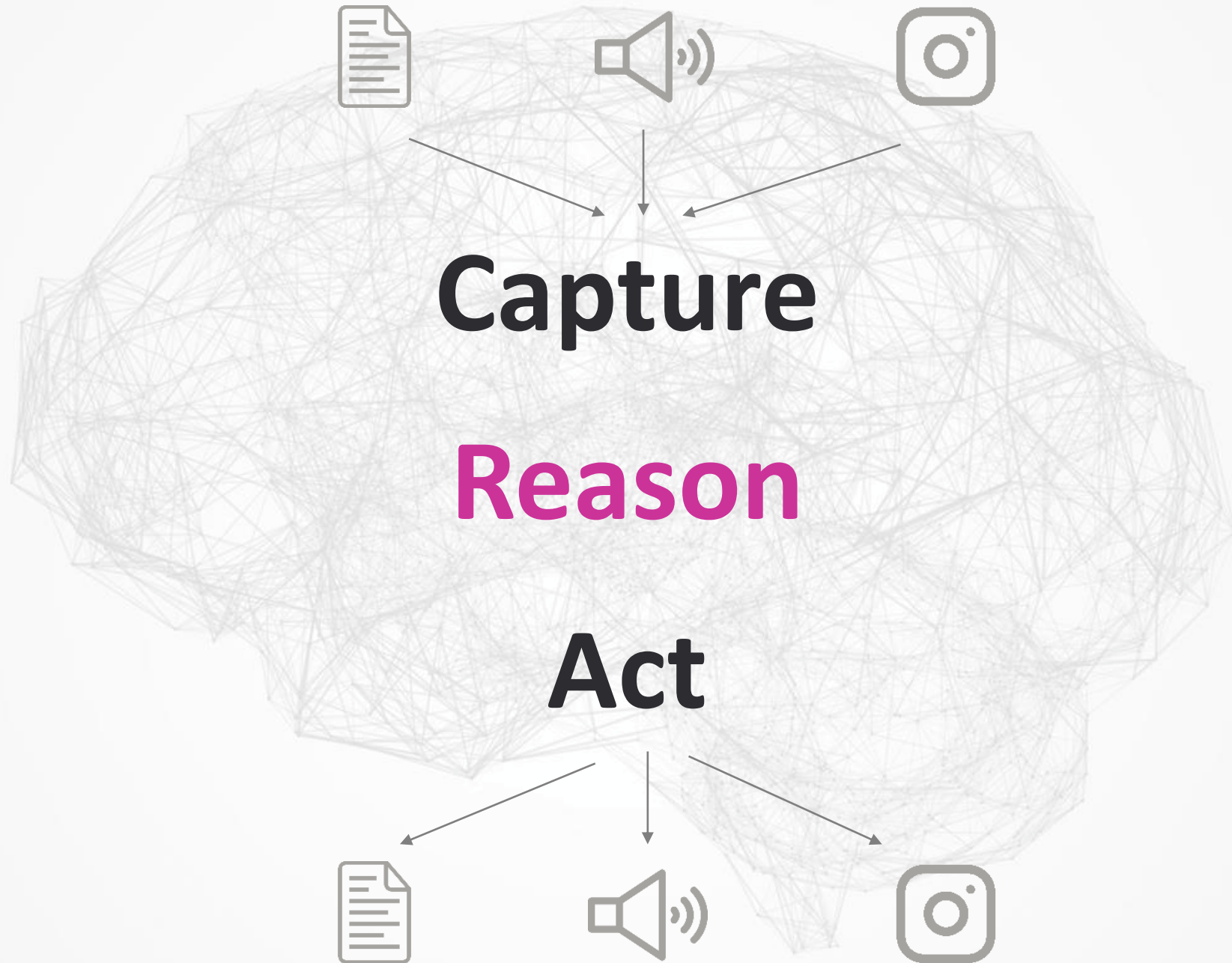
## Automatation

Write emails/letters and reply automatically.

## Search

Can search the context or data on which it has been trained/refined, summarize and generate appropriate responses to queries.





**Capture**

**Reason**

**Act**



# Retrieval Augmented Generation (RAG) on private documents



Unleash the power of ChatGPT on internal documents; contracts, instructions, standards, reports, procedures, specifications, etc.,

ChatGPT  
Azure



ChatGPT and GenAI Competence Center  
ChatGPT governance in line with internal rules and the European AI ACT



# European AI Act



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## Purpose

a framework for AI systems to protect EU citizens that ensures:

- safety
- transparency
- accountability

## Respect

1. existing laws
2. fundamental human rights
3. user safety



## **Global ethical leadership**

First horizontal framework for AI governance.  
Prior work is not as comprehensive (IBM, Google).

## **Comprehensive scope**

Covers a broad range of AI applications ensuring a tailored regulatory approach that encourages technological advancement.





## Innovation and regulation balance

Foster innovation while providing legal certainty for anyone in the AI value chain, facilitating the development of AI in a manner that benefits society.

## Outcome

Facilitates the development of a **single market** of AI systems that are:

- Lawful
- Safe and trustworthy

# Prior work

## Prior work from tech giants:

- **Google**'s AI principles that describe their commitment to developing responsible technology (2018)
- **Microsoft**'s Ethical AI: five key principles to consider to implement responsible and ethical AI (2019)
- **IBM**'s AI explainability 360: Open-source toolkit that helps you comprehend how machine learning models predict labels (2019)

## EU first draft arrived in 2019

- The EU's Ethics Guidelines mandate AI to be lawful, ethical, and robust, focusing on human oversight, safety, and fairness
- **GDPR, ESG**

## RISK LEVELS



# EXAMPLES OF SYSTEMS



Unacceptable risk: manipulative and exploitative systems, social scoring, remote biometric surveillance



High risk: biometrics, justice, access to education or employment, migration, essential services, or if subject to existing rules (e.g. toys)



Limited risk: chatbots, systems that generate or manipulate visual or audio content



Minimal risk: AI-enabled video games, spam filters

# Large Language **M**odels and their risks

- Discrimination and bias
- Copyright / IP issues
- Prompt injection attacks
- Personal data or sensitive code extraction
- Disinformation
- Malicious use
- Scamming and Fraud
- Generating toxic content

## **Overreliance**

(excessive trust and unsafe data entry)

# General-purpose AI (GPAI)

- 1. **Providers** need to perform a Systemic Risk assessment  
Huge model and/or compute might have big impact
- 2. **Deployers** need to review the use case

## RISK LEVELS



# Penalties for non-compliance

## Non-compliance with prohibitions:

Up to €35M or  
7% of global AT

## Non-compliance with other obligations:

Up to €15M or  
3% of global AT

## Supplying incorrect or incomplete information:

Up to €7.5M or  
1% of global AT

For **SMEs**:  
whichever of the  
two amounts is  
**LOWER**

Final amount  
depends  
on circumstances  
of incident



# Sparkle's offering

# Our most popular solutions

## EU AI Act Readiness Assessment

- Risk scoring
- Register framework
- Compliance roadmap
- Stakeholder report

## AI Compliance as a Service

- Coaching
- Compliance implementation
- FRIA (fundamentals rights impact assessments)
- System logging
- Risk report & rating
- AI Compliance Officer

## AI Compliance Officer Training

- 7 day training (online or in person)
- Become an AI Compliance Officer
- Get trained on all AI Compliance topics based on the EU AI Act

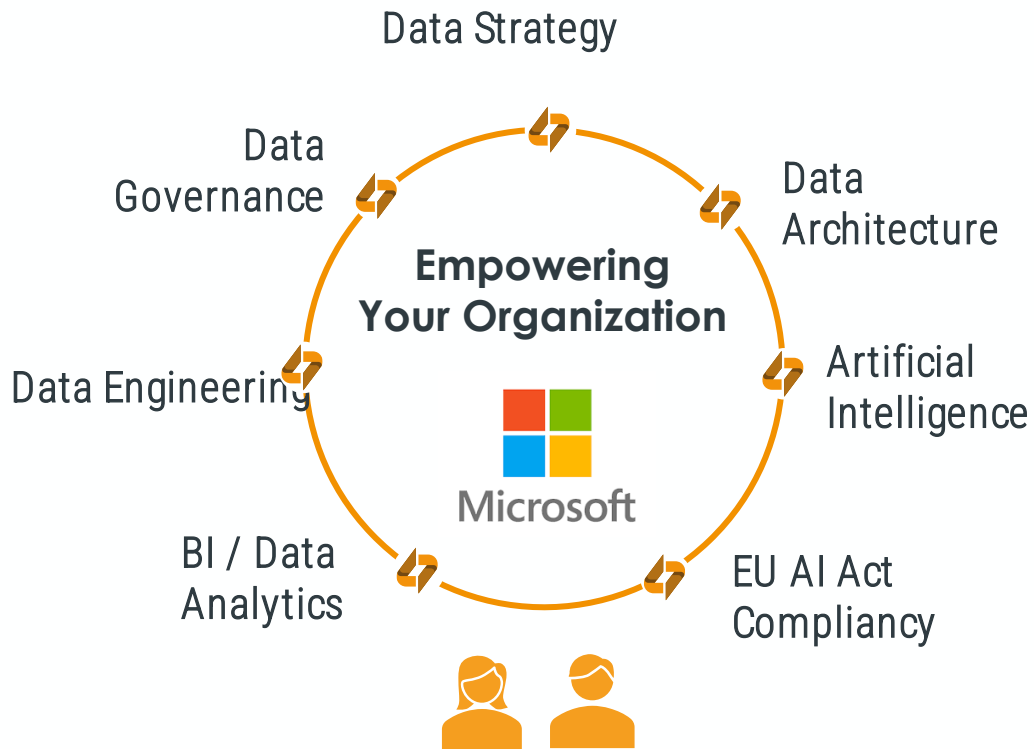
## Implementation Ethical Framework & Ethical Board

- Ethical framework tailored to the organization
- Design and organisation of ethical board
- Clear roles & responsibilities

## AI Workshop for C-level and board members

- Workshop
- Gain AI knowledge
- Draft AI strategy roadmap
- Description of principles and assumptions

## Maximizing the value of data



# Tapping into the Cronos Group ecosystem



Possibility to increase scale & augment specialized skills from our network of specialized partners

**> 650**  
competence centers

**+ 5.000**  
clients

**+1.050 Million € 15%**

revenue per year & no external shareholders

YOY sustainable growth for the past 30 years

## Business Strategy

- + Digital Transformation
- + Enterprise Architecture
- + Service Design
- + Business analysis
- + Change Management
- + Product owners/managers

## Innovation & Early access

- + Innovation as a Service
- + Prototyping as a Service
- + Blockchain
- + Solid (personal data vaults)
- + Quantum Computing
- + Edge Computing
- + AR/VR
- + Artificial Intelligence
- + Enterprise Architecture
- + 5G
- + Metaverse
- + Internet of Things

## Cloud

- + Amazon Web Services
- + Microsoft Azure
- + Google Cloud Platform
- + Salesforce

## Digital marketing

- + Brand Purpose Strategy
- + Product & Service Design
- + Customer Insights & Behaviour
- + Hubspot
- + Branding Design
- + Content Marketing
- + Conversational Marketing
- + Influence Marketing
- + Integrated Campaigns
- + Video marketing

## Cyber Security

- + Security Advisory & Architecture
- + Certification Advisory & Assistance
- + Privacy & Data Protection (DPO)
- + Threat protection
- + Ethical Hacking (Red Teaming, PEN Testing)
- + Identity & Access Management
- + Zero Trust
- + Vulnerability Management
- + Intrusion prevention & detection
- + Endpoint detection services

## Product Dev & Integration

- + ERP
- + CRM
- + Custom Development
- + Front-end Development
- + Cloud Native Development
- + Agile Software Factories
- + Hybrid Integration
- + MesPlatforms
- + saging & Collaboration
- + Reactive architectures
- + Streaming architectures
- + Web, Document & Content Management
- + Enterprise Search
- + UX & UI
- + Low code/No code platforms
- + Customer & Serious Game Development
- + Digital Asset Management
- + Integration Middleware

## Intelligent Automation

- + Business Process Management
- + Robotic Process Automation
- + Process Mining
- + Artificial Intelligence
- + Conversational Interfaces / Chatbots
- + Marketing Automation...
- + Document Processing

## Commerce

- + End-to-end solutions (Shopify, Intershop, SAP...)
- + Customer engagement
- + Product Information Management

## Infrastructure & managed services

- + Hybrid datacentre
- + Connectivity
- + Intelligent Cloud
- + Modern workplace
- + Migrate to the cloud (lift and shift)
- + Business Continuity



CONTACT

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