



Make It, Buy It, or Leave It

Strategies for Efficient AI Adoption

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AI in **manufacturing** (through digital twins)

- IT Consultant and Trainer
- Business Informatics Researcher (441 citations) [1]

AI for **general public**

- University lectures AI for law/business administration
- VHS courses AI for general public [2]
- Certified AI Manager trainings [3]

[1] https://scholar.google.com/citations?user=TGGaQ_0AAAAJ

[2] https://vhskurs.linz.at/index.php?kathaupt=18&suchesetzen=false&kfs_dozentid=139372

[3] <https://tecnovy.com/de/tecnovy/certified-ai-manager>

Agenda

1

AI methods + use cases

2

AI project identification

3

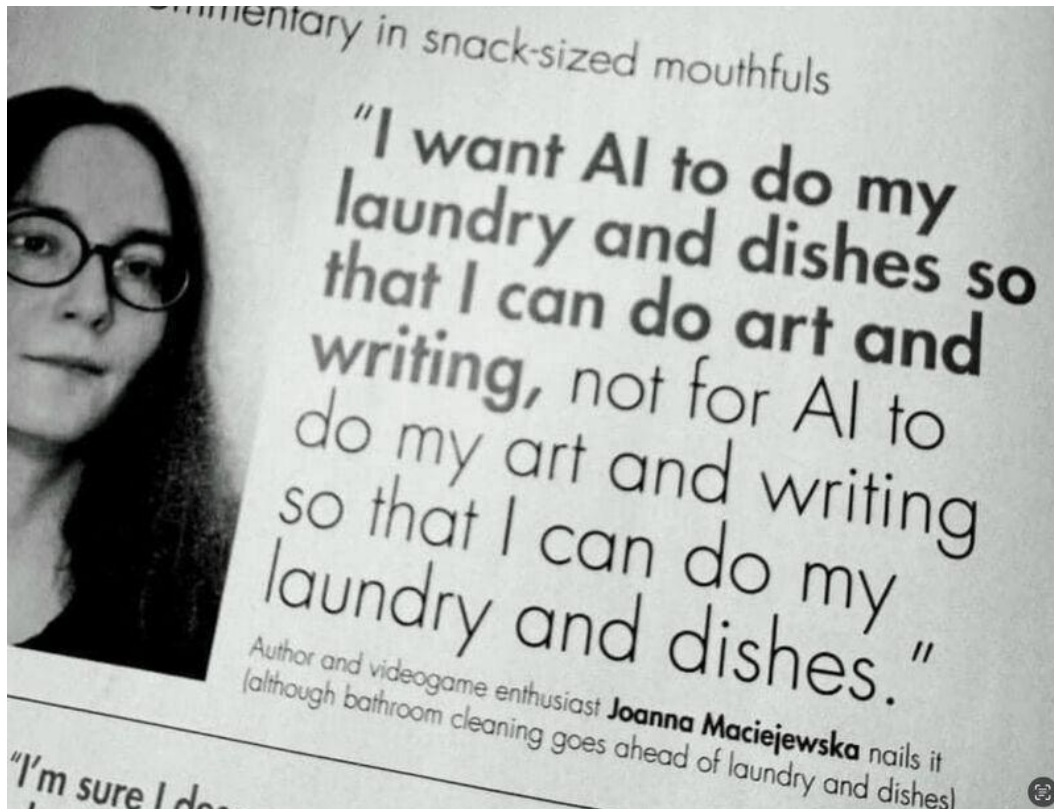
Is my data ready?

4

ROI Analysis + Sourcing Strategies



Potentials of Artificial Intelligence



Reproducing human behavior

- Automation of repetitive tasks
- „Replacing“ human interactions
 - E.g., brainstorming

Simplification of tasks that are hard for us humans

- It's about the question, not the answer (J. Kepler)
- What can we not read from the data??

Better products/customer experience

All based on natural language

Why?

Will AI take my job?

Costs of Delayed AI Adoption



Costs



Why?

Missed Strategic Insights

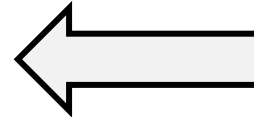
Higher Customer Churn

Overloaded Teams + Higher Operating Costs

Delayed Decision-Making

Lack of Personalization

Higher Error Rate



AI uncovers trends and patterns you would spot too late manually

AI increases user engagement

AI automates manual tasks

AI speeds up rapid prototyping and quickly prepares insights

AI personalizes emails, content and offers based on a massive amount of data

AI serves as the perfect complement to manual quality control

Do We Need AI Projects?



Can't we just use the Generative AI tool from OpenAI / Microsoft / Google / ...?

Yes — but how?



They have the money, we have the brain.

— Sepp Hochreiter

Reasons for failed AI projects

1

Investing in the wrong use cases

AI is adopted for hype rather than real business problems — only ~1% of companies rate their GenAI strategy as mature.

Source: McKinsey, The State of AI, 2025

2

Missing AI strategy

Just 15% of US employees say their employer has communicated a clear AI strategy. *Source: Gallup, Gallup Studie 2024, 2024*

3

Poor data quality

Gartner estimates ~85% of AI projects fail due to poor data quality or lack of relevant data. *Source: Gartner*

4

No AI-ready data & skills gap

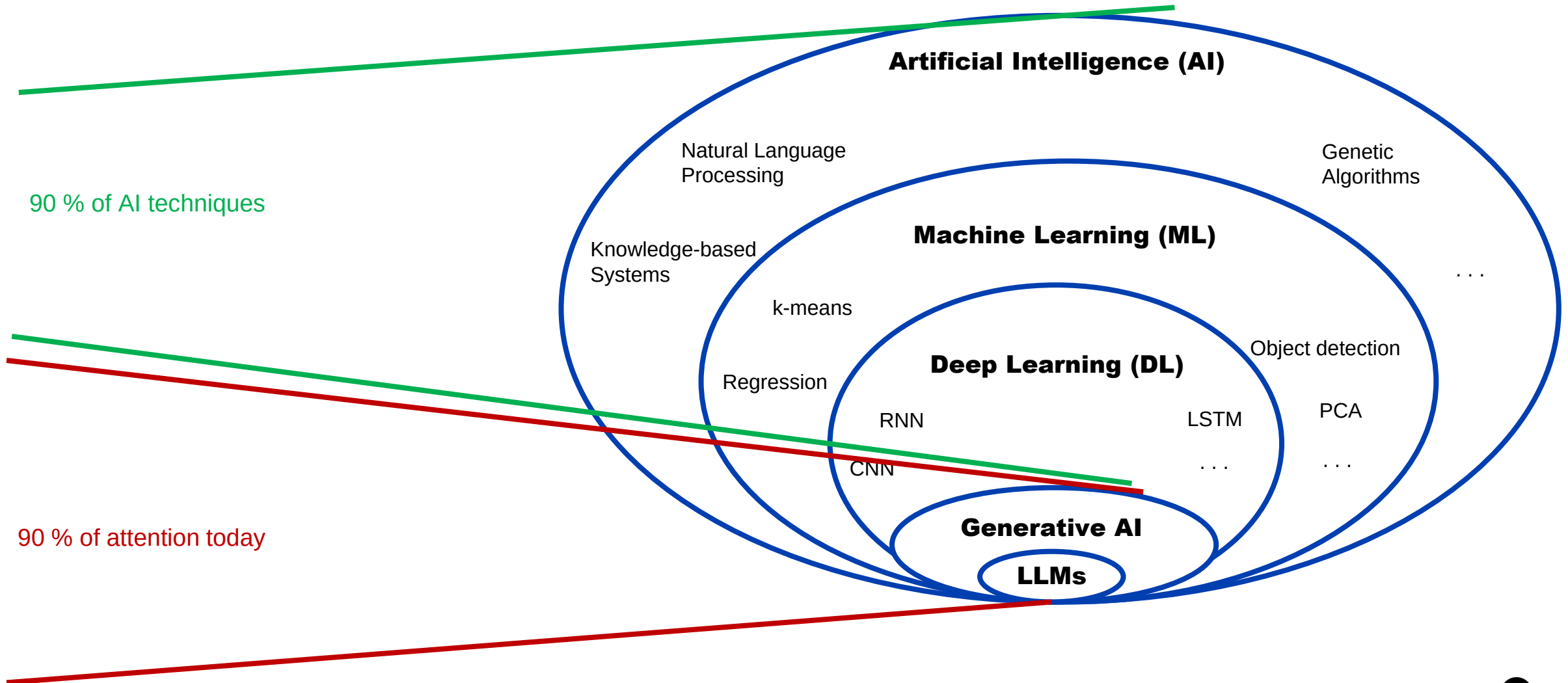
43% of organizations cite data readiness and 35% a skills shortage as their top obstacles to AI. *Source: Informatica, CDO Insights, 2025*

5

Stuck in proof-of-concept

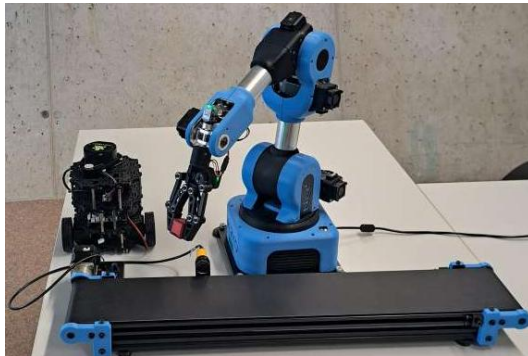
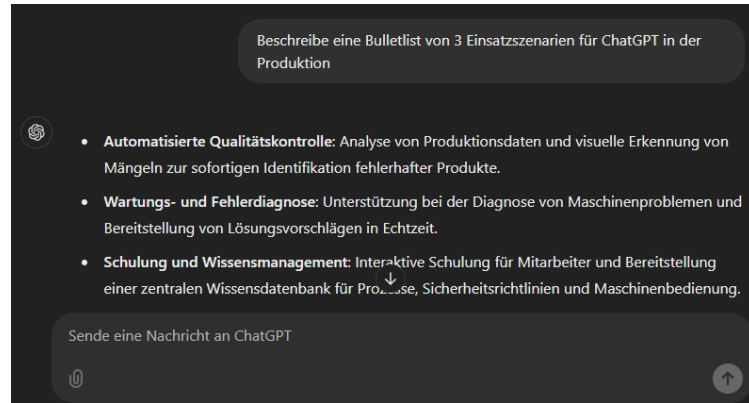
Over 80% of AI projects never reach production — twice the failure rate of non-AI IT projects. *Source: RAND Corporation, The Root Causes of Failure for Artificial Intelligence Projects and How They Can Succeed, 2024*

„AI Tunnel View“



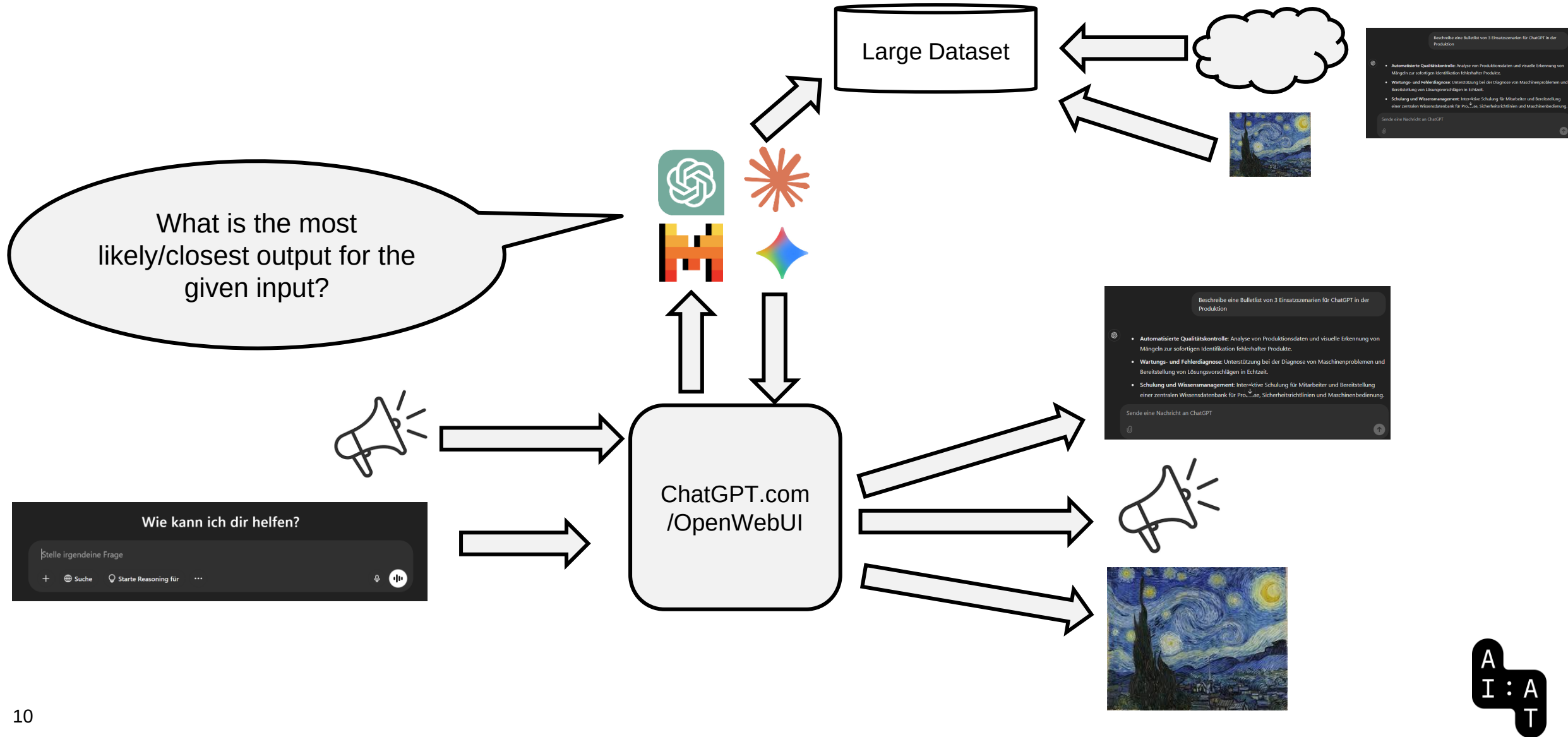
Source: https://www.linkedin.com/posts/jaylatta_llm-tunnel-vision-weve-fallen-into-the-activity-7386990451360387072-y6KI

Generative AI Chatbots



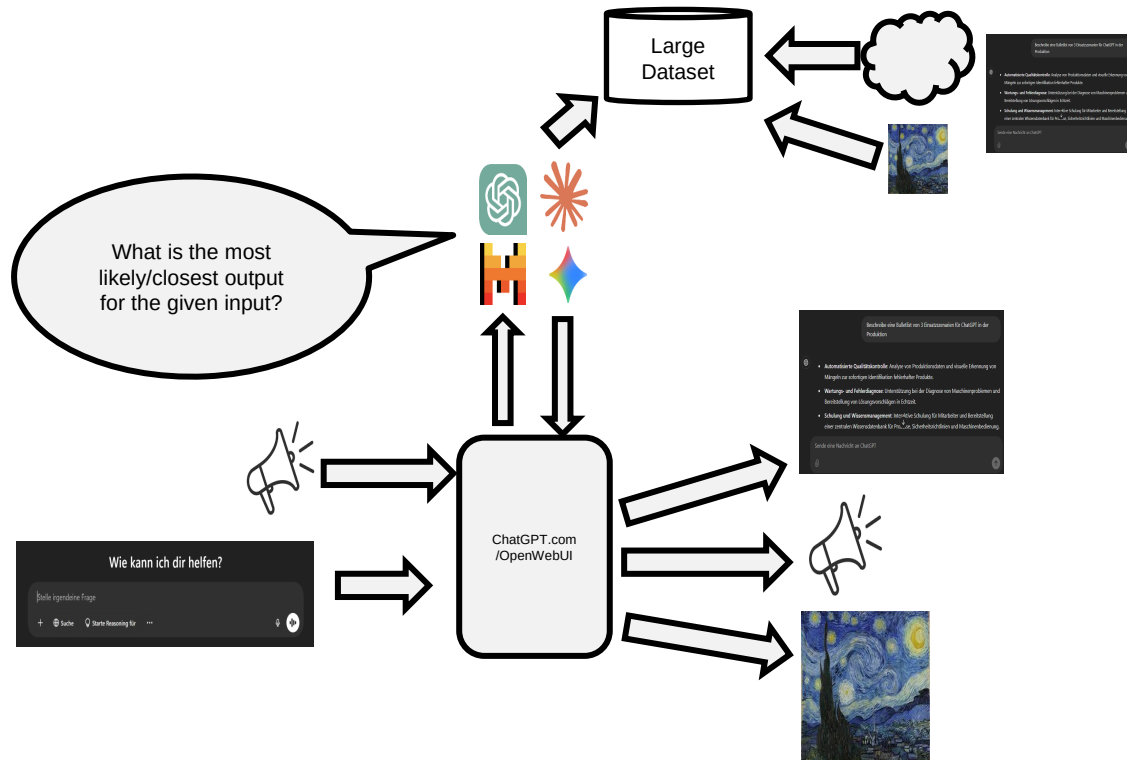
SAP

Generative AI “Under the Hood”

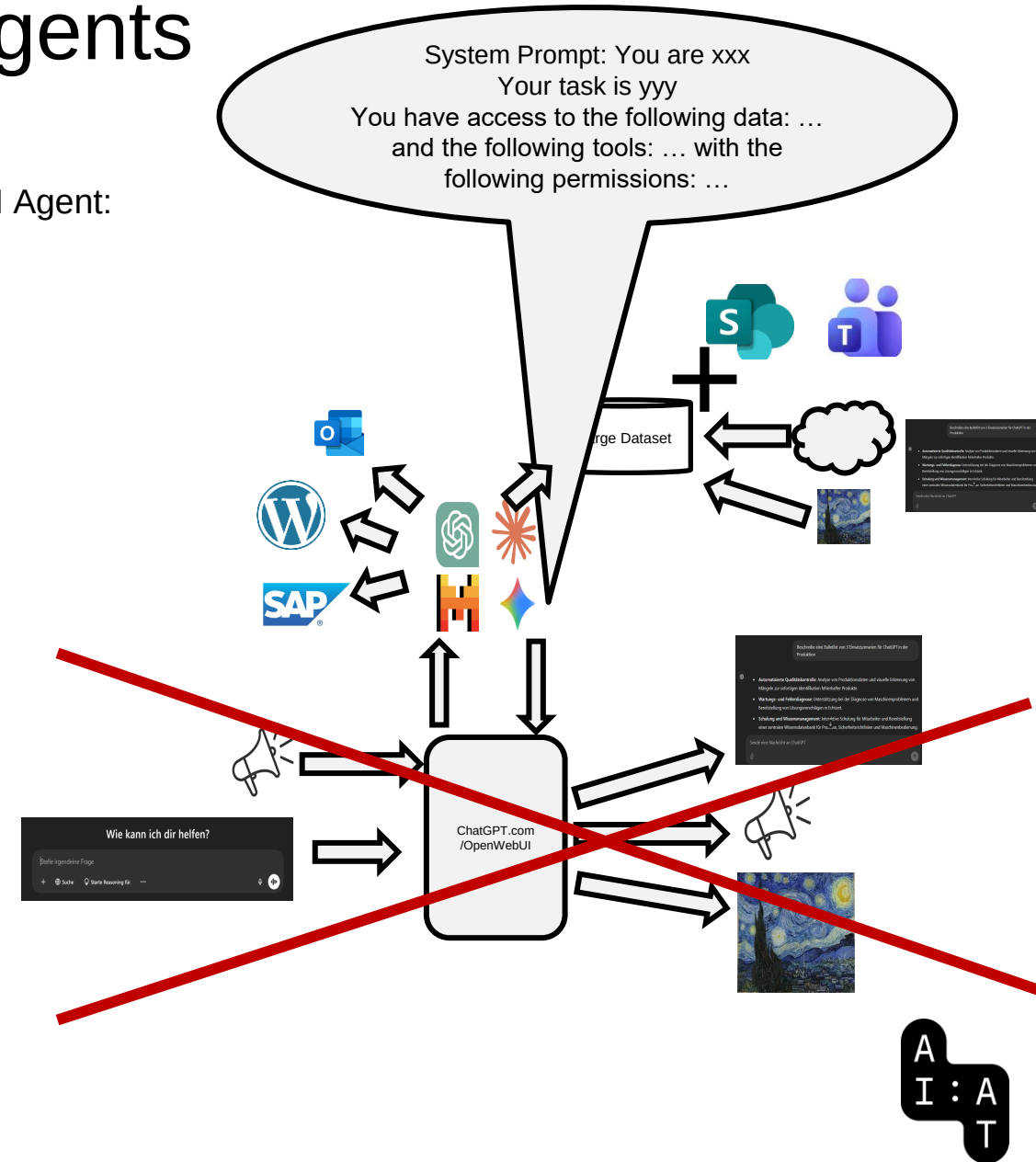


Difference AI Chatbots and AI Agents

AI Chatbot



AI Agent:



AI Agents: Examples

Agent 1: E-Mail Briefing

System Prompt: Ich bin Geschäftsführerin eines.

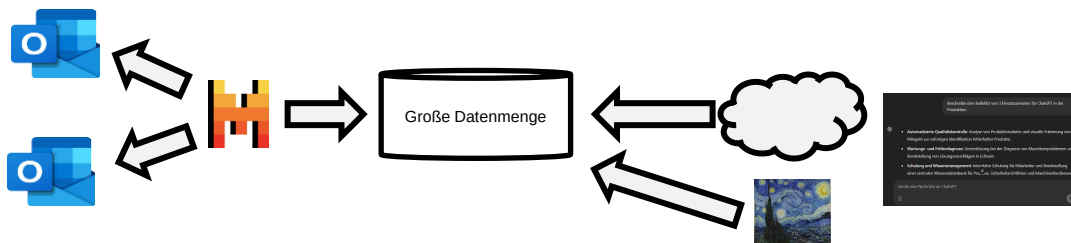
Sende mir jeden Montag um 08:00 eine Zusammenfassung der E-Mails, welche ich die letzten 52 Stunden erhalten habe. Mich interessiert dabei vor allem:

- Gibt es Dinge, die meine sofortige Aufmerksamkeit benötigen?
- Was sind Action Points, die neu hinzugekommen sind?
- ...

Sende mir das Ergebnis per E-Mail.

Berechtigungen

- E-Mail von xx (lesend)
- Eigenes Mail-Postfach (schreibend)



Agent 2: Invoice Scanning

System Prompt: Verwende den angehängten Scan einer Rechnung. Verwende das Adobe OCR Tool, um folgende Rechnungsdaten auszulesen:

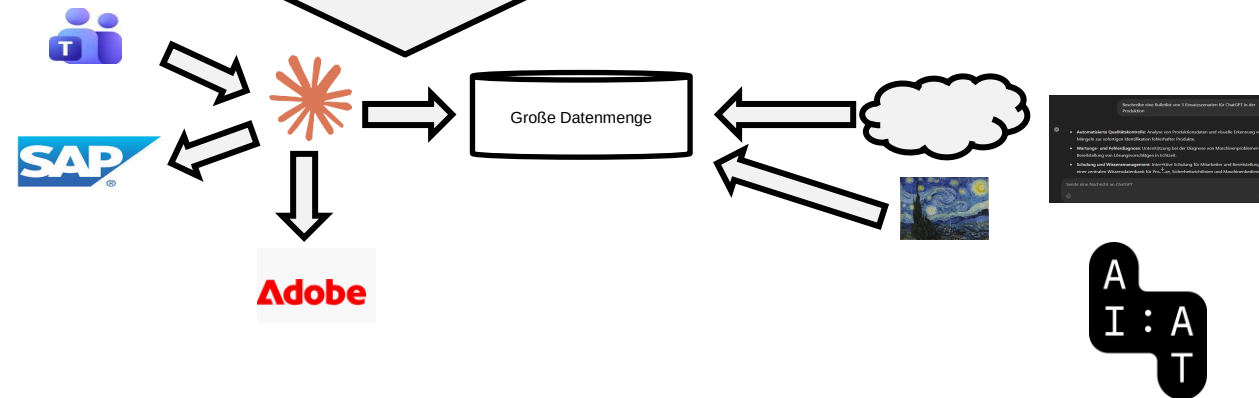
Erstelle im Anschluss einen neuen Wareneingang in SAP, und speichere die entsprechenden Rechnungsdaten ab.

Bestätige mir das erfolgreiche Anlegen der Rechnung mit einer kurzen Nachricht, inklusive Link zum angelegten Wareneingang zur Überprüfung.

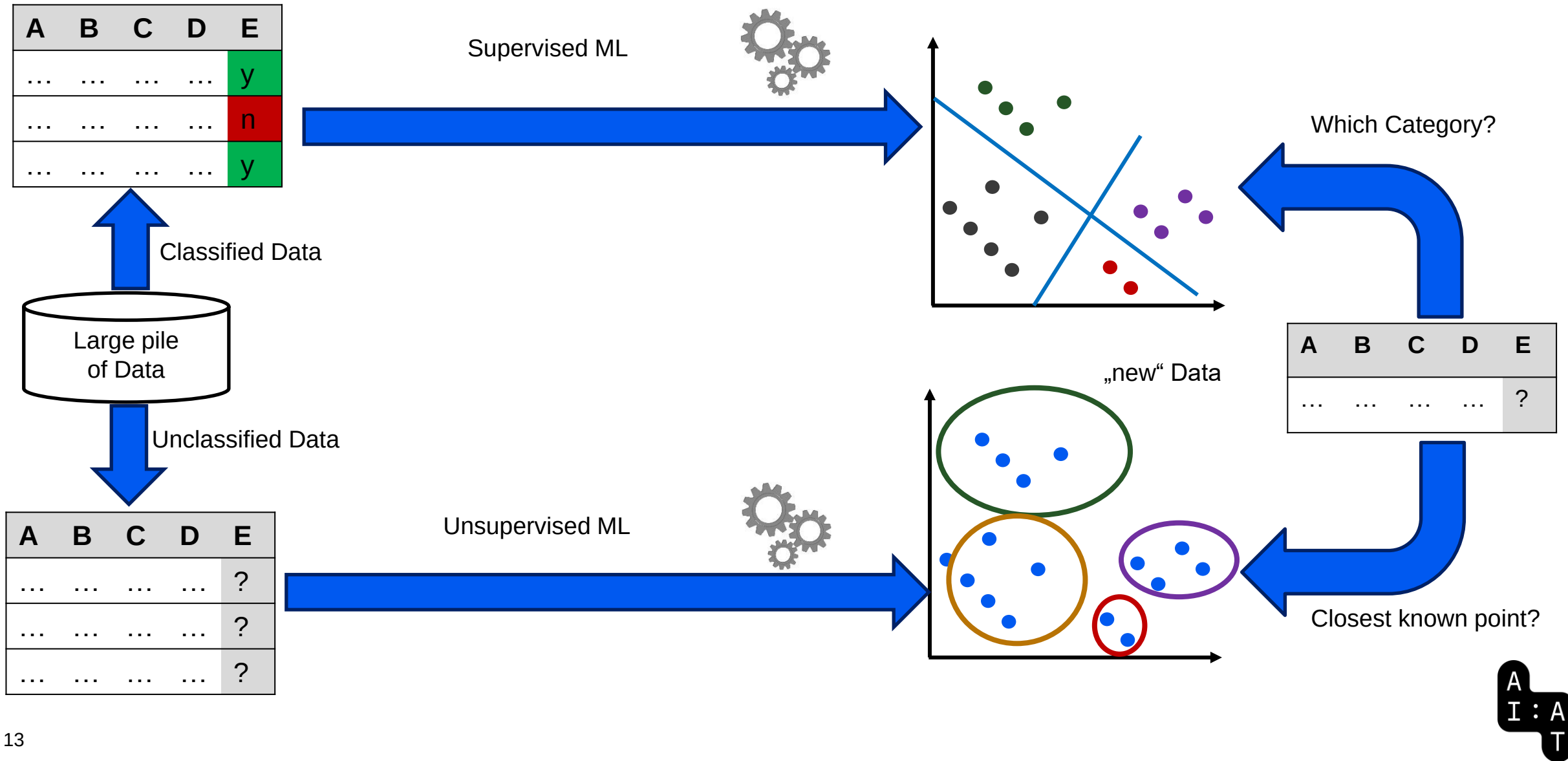
User Prompt: Hier das Dokument mit der Rechnung

Berechtigungen

- Eigenes Teams Postfach (lesend + schreibend)
- SAP Wareneingang (schreibend)



Machine Learning (ML)



Tourism

Challenge: Food waste
due to overproduction

Value: protection of resources

Value: more efficient use of personnel



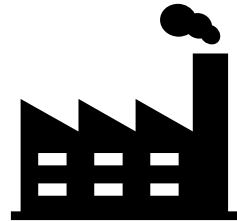
Created by Tithy
from Noun Project

Manufacturing

Challenge: More and more
mistakes during production

Value: more efficient use of machines

Value: less accidents/ increased
longevity of machines



Created by vighnesh anvekar
from the Noun Project

Healthcare

Challenge: Lack of doctors

Value: increased health of overall population

Value: more time for patients/more
patients treated

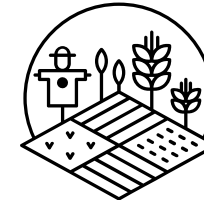


Farming

Challenge: Animals on field
during harvesting

Value: saving lives

Value: increased efficiency of harvesting/
increased longevity of machines



Created by Cindy Van Heerden
from the Noun Project

Artificial Neural Networks

Brain comprises ~10 Billion Neurons

Each Neuron is connected with 10.000 other Neurons

All inputs are processed in parallel by Neuron

Learning = change in connections between neurons (=Synapses)

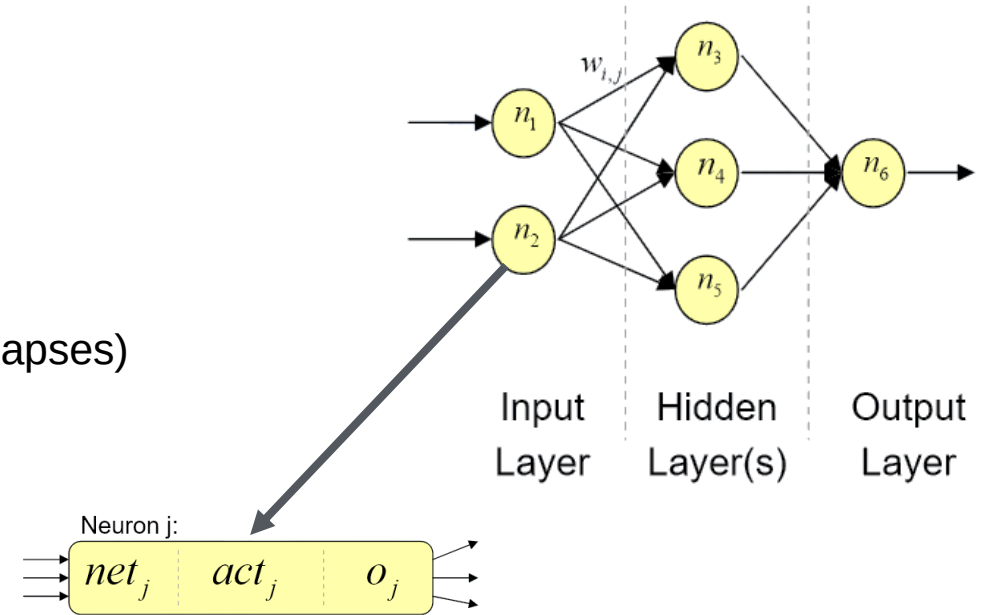
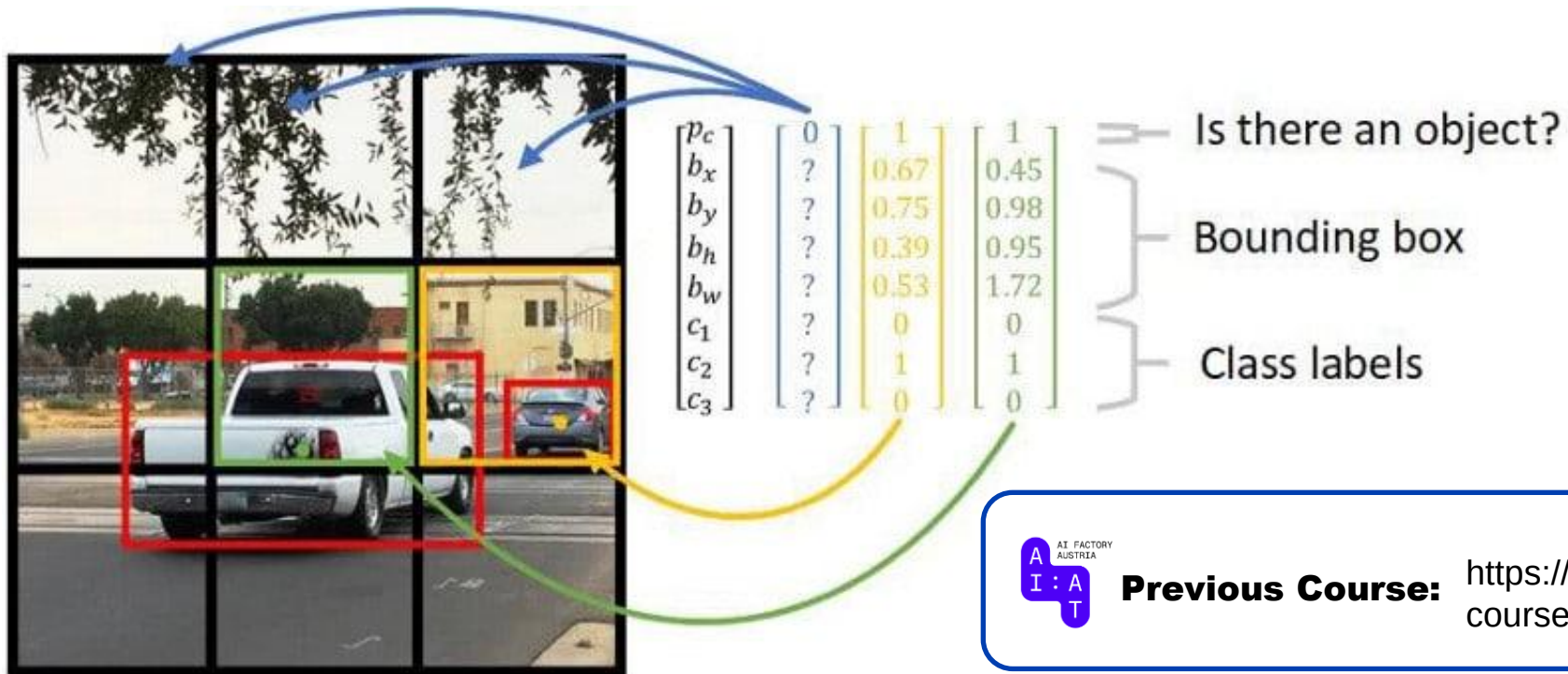


Image Detection



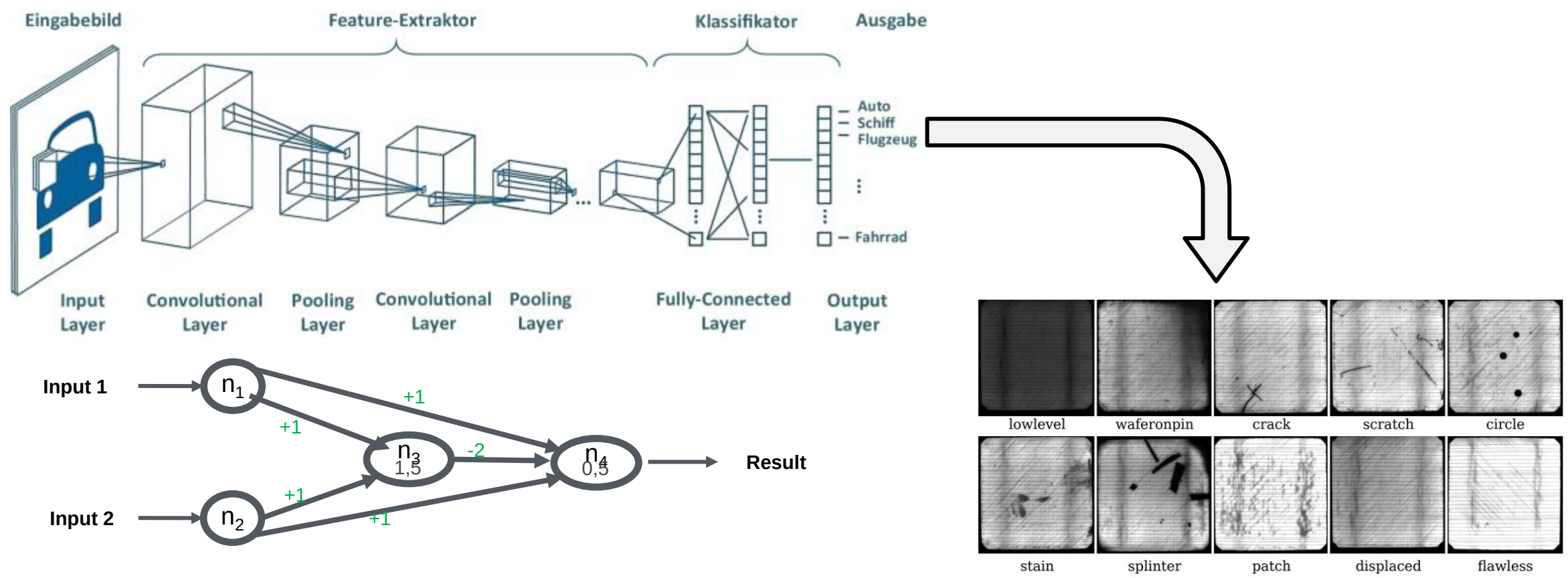
Previous Course:

<https://events.asc.ac.at/event/252/page/663-course-material>

Source: <https://datasolut.com/einfuehrung-in-maschinelles-sehen/>



Anomaly Detection in Manufacturing



Source: <https://link.springer.com/article/10.1365/s40702-020-00641-8>



Genetic Algorithms - Overview

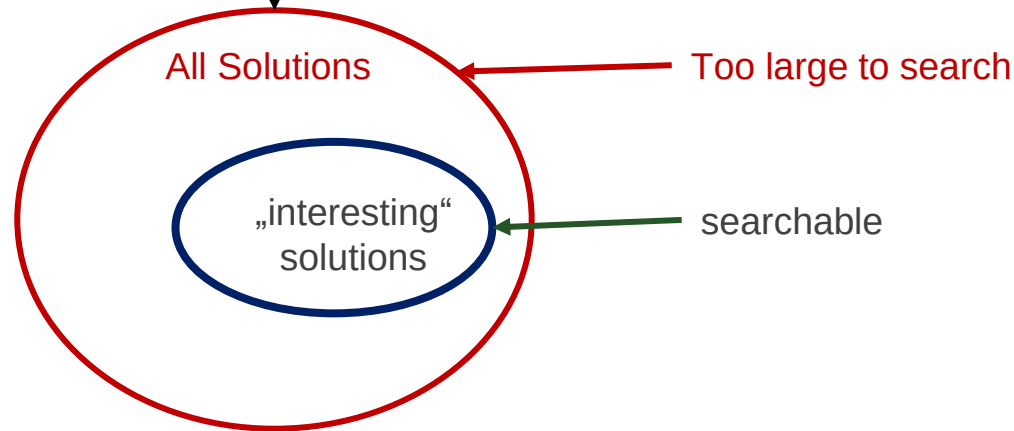
Problem statement

„What's the optimal plan?“



Solution: Genetic Algorithm

Challenge



AI Project Identification

Identifying Use Cases

What are my top 3 issues as an organization?



What can we do about it?



How can we do this?

Problem 1: Low response rate from advertising campaigns



Lever 1: Increased Efficiency



Use Case 1: Customer-specific Marketing Materials

Problem 2: High effort for accounting of expenses and invoices



Lever 2: Automation



Use Case 2: Automated Invoice Parsing

Problem 3: Too much machine downtime in production



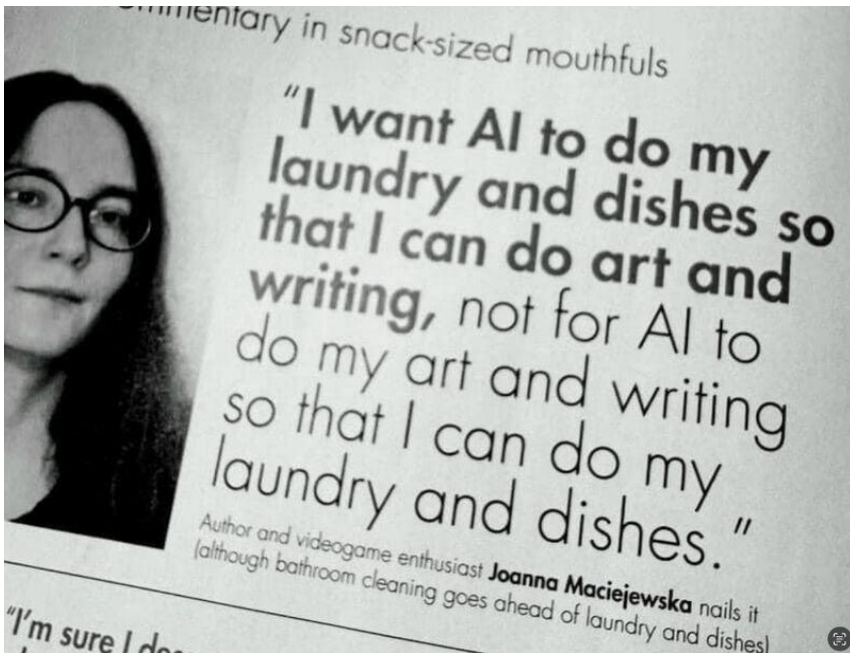
Lever 3: Extended Maintenance Intervals



Use Case 3: Predictive Maintenance for machines with highest downtime

„There's an AI for that“

Is AI really the best fit for my problem?



Advantages

- Automation
- Creativity-Boost

Disadvantages

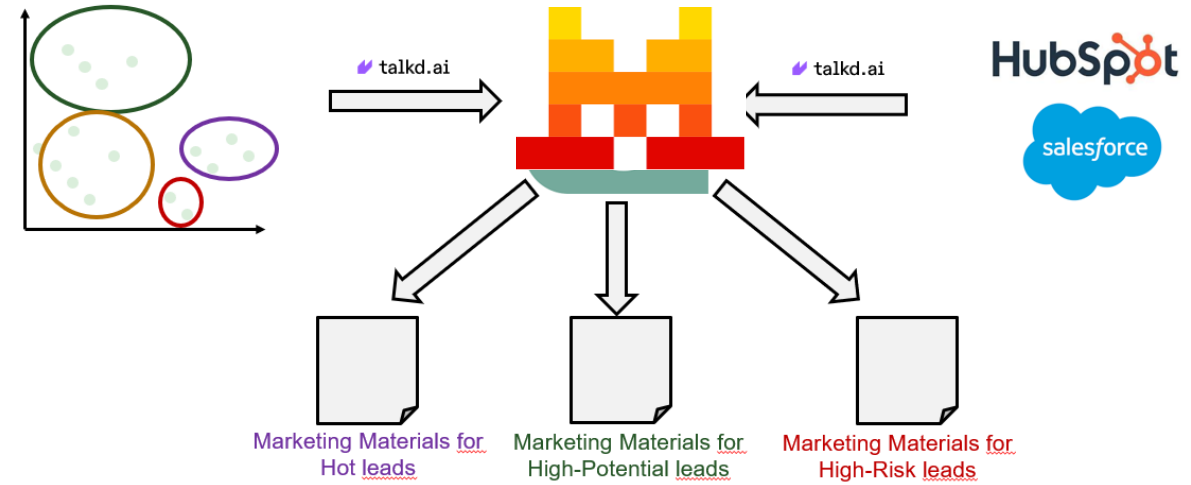
- Non-Deterministic
- Stochastic (imprecise)
- Hallucinations

Alternatives

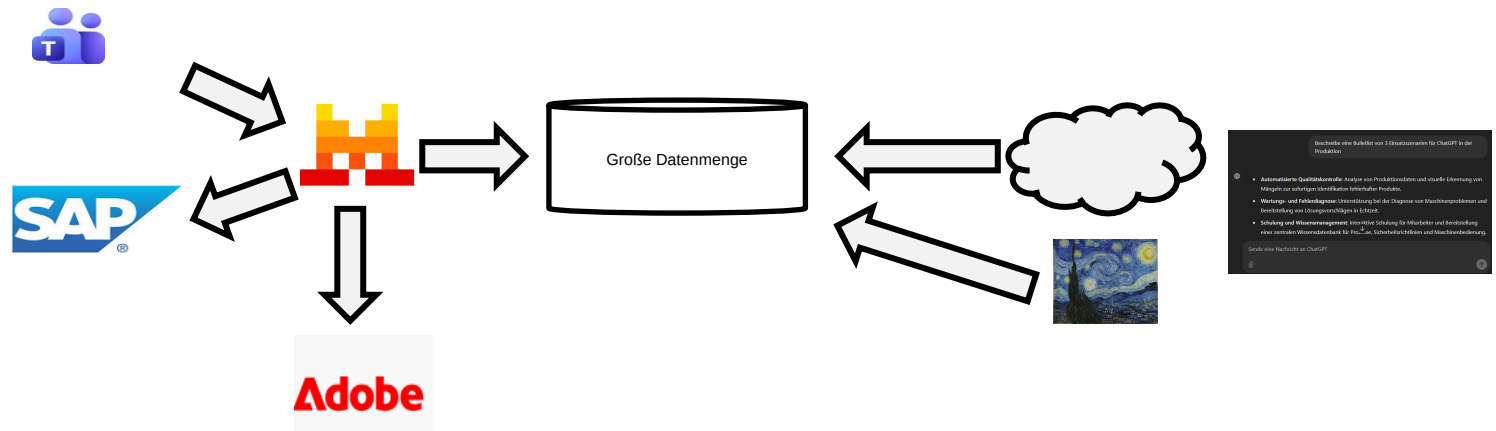
- Status Quo
- „Traditional“ Automation
- Manual Data Analysis

Identifying Use Cases

Use Case 1: Customer-specific Marketing Materials

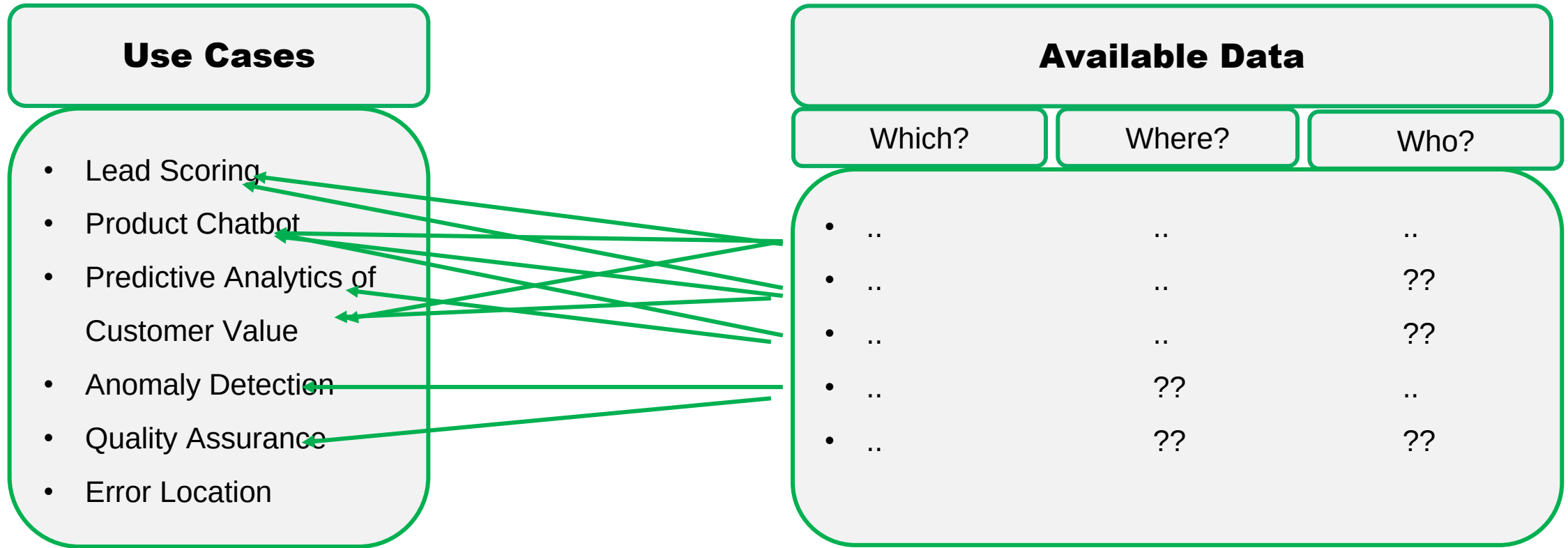


Use Case 2: Automated Invoice Scanning

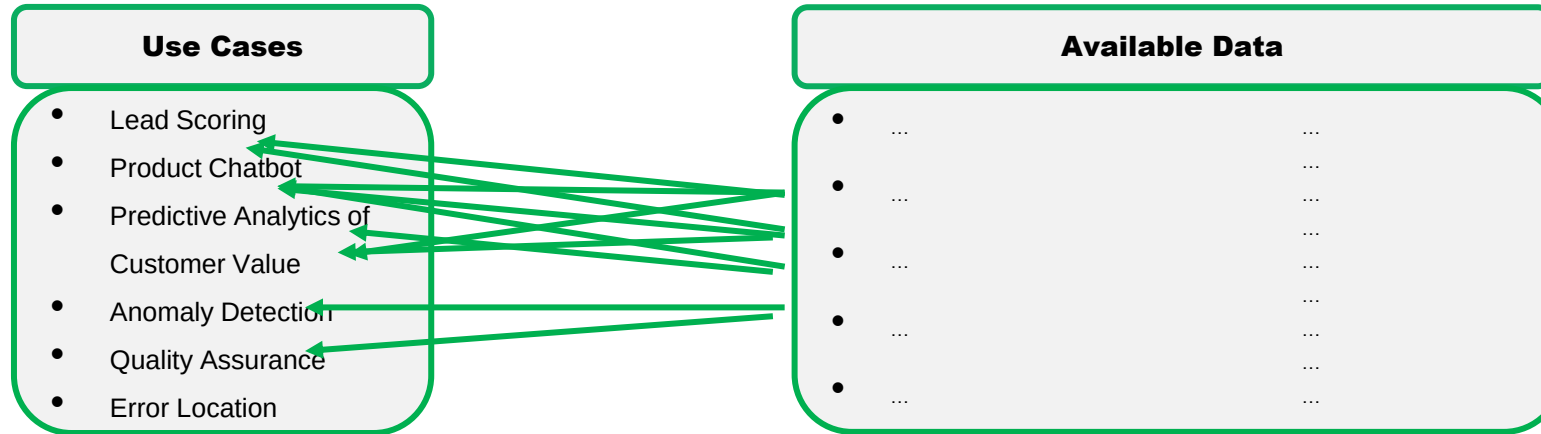


Is my data ready?

Data Map



Identifying Further AI Projects



Data points without Use Cases?

Theoretical know-how on potentials and techniques

Creativity techniques

TUSCANE

Is my data ready for AI?

- **Timely:** recent, (regularly) updated, tagged with correct timestamps
- **Usable:** are we allowed to use data, can we actually access data?
- **Structured:** common format, common storage location?
- **Complete:** what do we need, what are we missing?
- **Accurate:** garbage in – garbage out
- **Neutral:** how can we avoid bias?
- **Enough:** a LOT of data points required to reasonably train AI models



Data Map + TUSCANE



- Step 1: Create a data map for your organization
- Step 2: List use cases and their relation to the data map
- Step 2: Assess available data according to TUSCANE and identify GAPS



Duration: 30 Minutes

Use template on training page

Work in groups of 5, 15 Minutes presentation/discussion afterwards

ROI Analysis

**Firing the Junior
Data Scientist to save
\$4000 per month**



**LLM API Costs
\$100,000 per month to
do the same job**



Source: <https://www.linkedin.com/pulse/enterprise-ai-needs-new-agentic-architecture-steve-nouri-om7pe/>

Does my AI project pay off?

Step 2:

Investment?

$$\text{ROI} = \frac{\text{Return in considered period}}{\text{Investment}} \%$$

*percentage of profit obtained
for each dollar invested*

$$\text{Payback period} = \frac{\text{investment}}{\text{Return/year}} \text{ years}$$

*How long until the
investment pays off?*

Step 1:

Value?

Return?



Typical return of AI projects

Reduced manual labour = (AS-IS - PLAN) * hourly rate €

- AS-IS hours: number of hours a person requires for a task today
- PLAN-hourse: number of hours person requires for a task with AI assistance

Reduced error rate = (#errors AS-IS * cost/error AS-IS) - #errors PLAN + costs/error PLAN) €

- # AS-IS errors: how many errors occur currently?
- AS-IS cost per error: how much does an error cost us on average currently?
- # PLAN errors: how many errors will likely occur after introducing the AI solution?
- PLAN cost per error: how much does an error cost us on average after the AI introduction?

Further return types

Increased revenue

Increased customer satisfaction (and thus increased revenue)

Replacement of existing tools

- How much does the current tool cost that will no longer be needed?
- Often related to reduced working time (AI tools are more expensive, but ultimately save working time)
- Example: “AI Researcher” for 20K/month (Sam Altman/OpenAI)

Example calculation of returns

Individualized Marketing Materials

- Rationale: Currently, the bottom 40% of customers generate €20,000/month with a response rate of 5%
With AI we expect to increase the response rate to 30% (a 600% increase), thereby increasing revenue by 500% to €100,000

Expected Revenue Increase = € 80.000/year

Invoice-Scanning

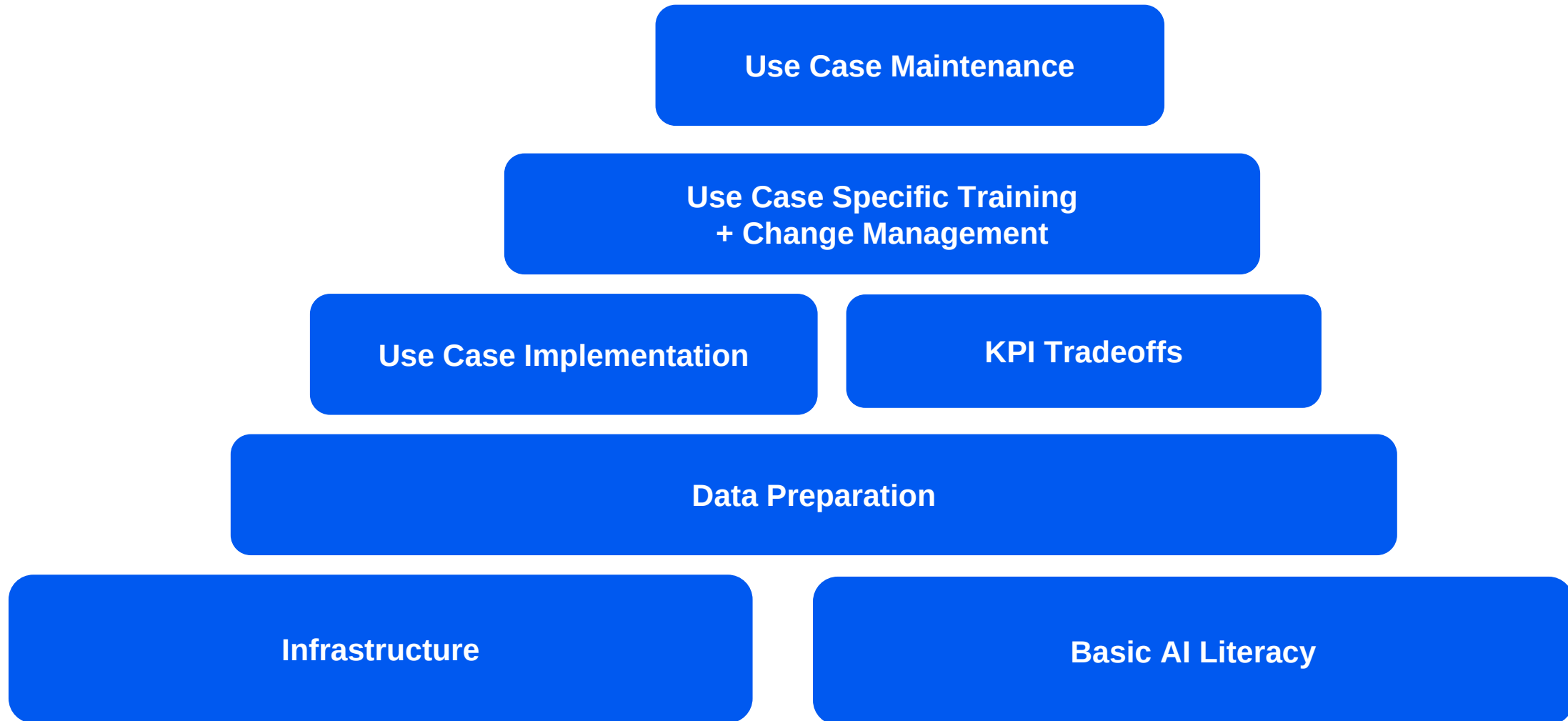
- Reduced work effort Controlling: (20 %): 60K/year
- Overhead für scanning: 10K/year

Manual labor reduction = € 60.000 - € 10.000 = € 50.000/year

Investment?

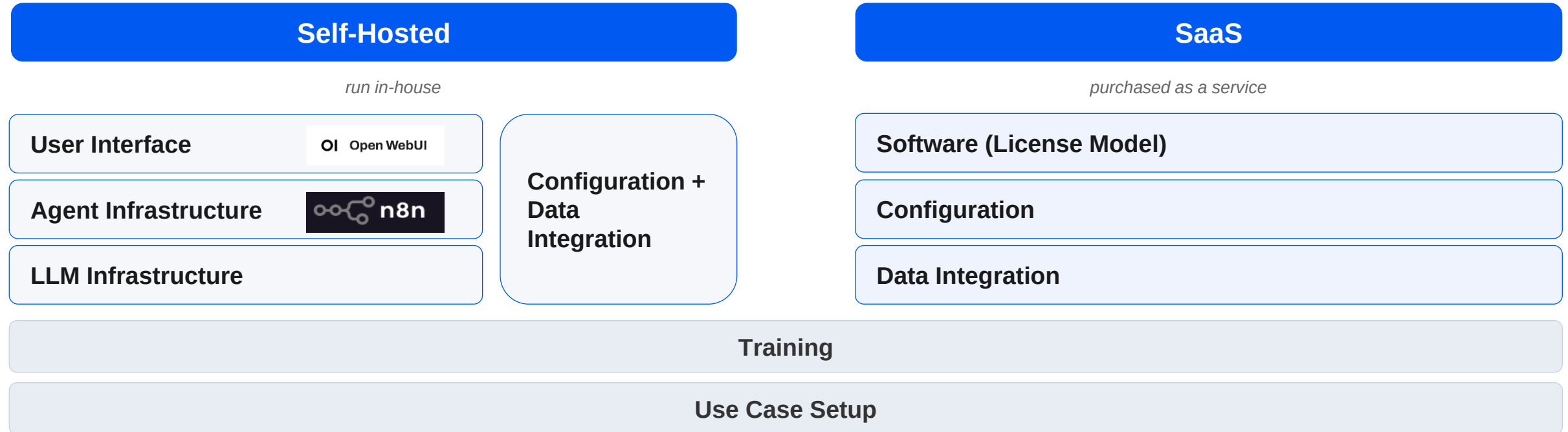


Investment Areas of AI projects



Infrastructure Sourcing: Self-Hosting vs SaaS

Which components do you run yourself — and which do you buy as a service?



LLM Infrastructure

How big does my LLM need to be?

SLM

- Runs on PC
- Low token consumption



Fast LLM

- Cloud or supercomputer
- Lower token consumption than LLM
- Up to 20% of the price of frontier LLMs



Frontier LLM

- Runs in the cloud
- Self-hosting usually not possible

Where does it run?

On-Premise · only for open-source models

- Full control and sovereignty
- Open-source software free of charge

Hardware Options

- **Mac Mini (SLM):** 700 €
- **Own server (Frontier LLM):** 40,000 € + approx. 1,000 €/month (electricity, cooling, maintenance)
- **vServer (Frontier LLM):** 5,000 €/month, billed hourly
- **Supercomputer:** 1 million € and up

Cloud-Hosted LLM

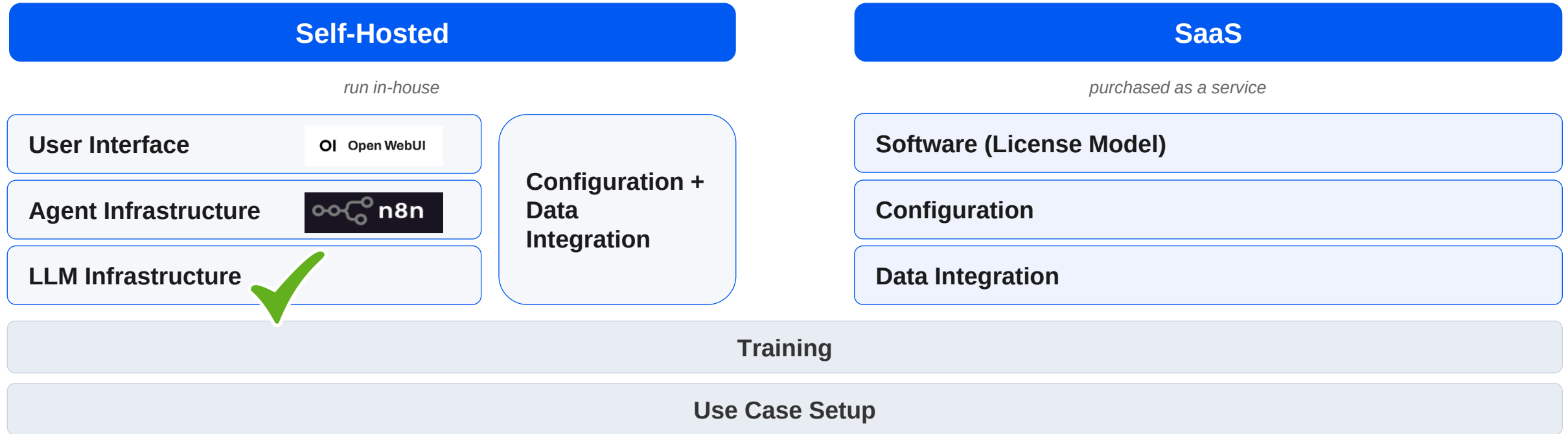
- Cost per call / request
- Demos + small projects possible without large investment
- Costs can escalate quickly

Typical Providers

OpenAI, Anthropic, Google, Microsoft Azure, AWS Bedrock

Infrastructure Sourcing: Self-Hosting vs SaaS

Which components do you run yourself — and which do you buy as a service?



Agent Infrastructure



<https://n8n.io/>

Self-Hosting in Cloud

20 € / month · setup + maintenance required

SaaS

20 € / user / month

Self-Hosting by N8N.IO

667 € / month

Flexible deployment

Self-hosted or SaaS · Full data control



<https://www.make.com/>

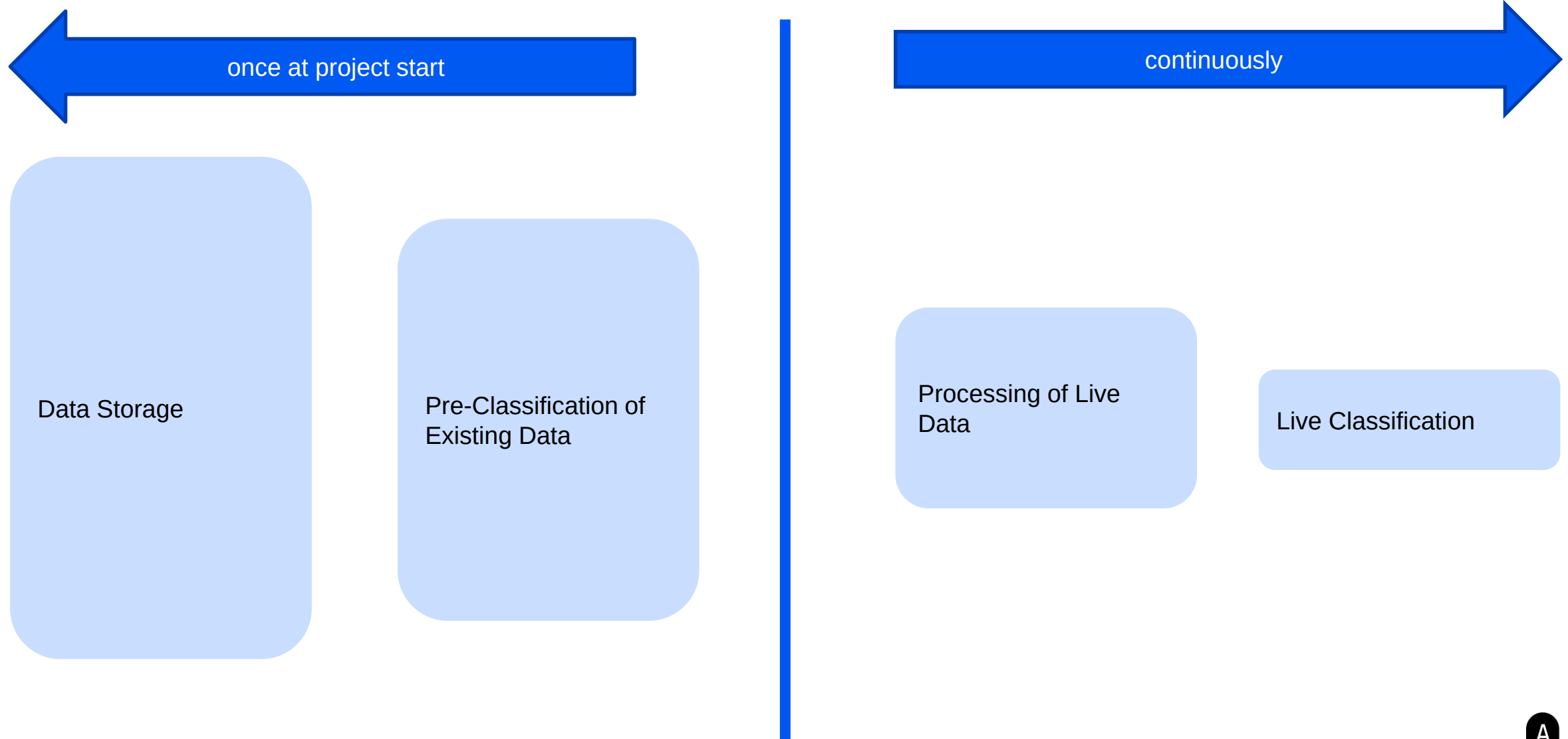
European provider

- Only SaaS possible
- Higher usability than n8n
- **From 10 €** / user / month

Easy entry

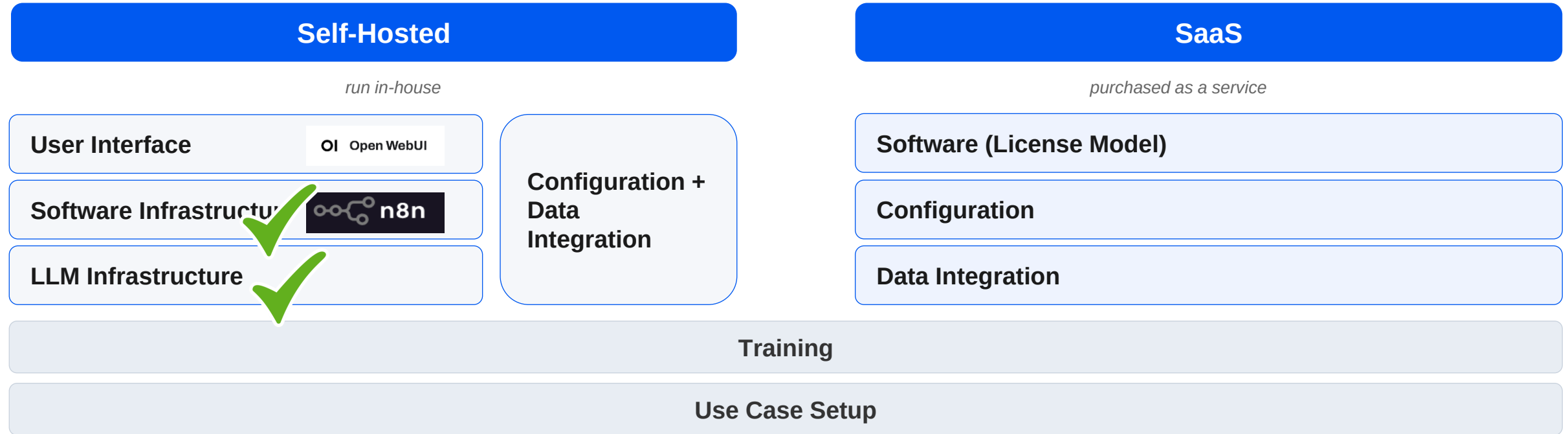
No infrastructure · Ready to go instantly

Supervised ML: Hardware Requirements

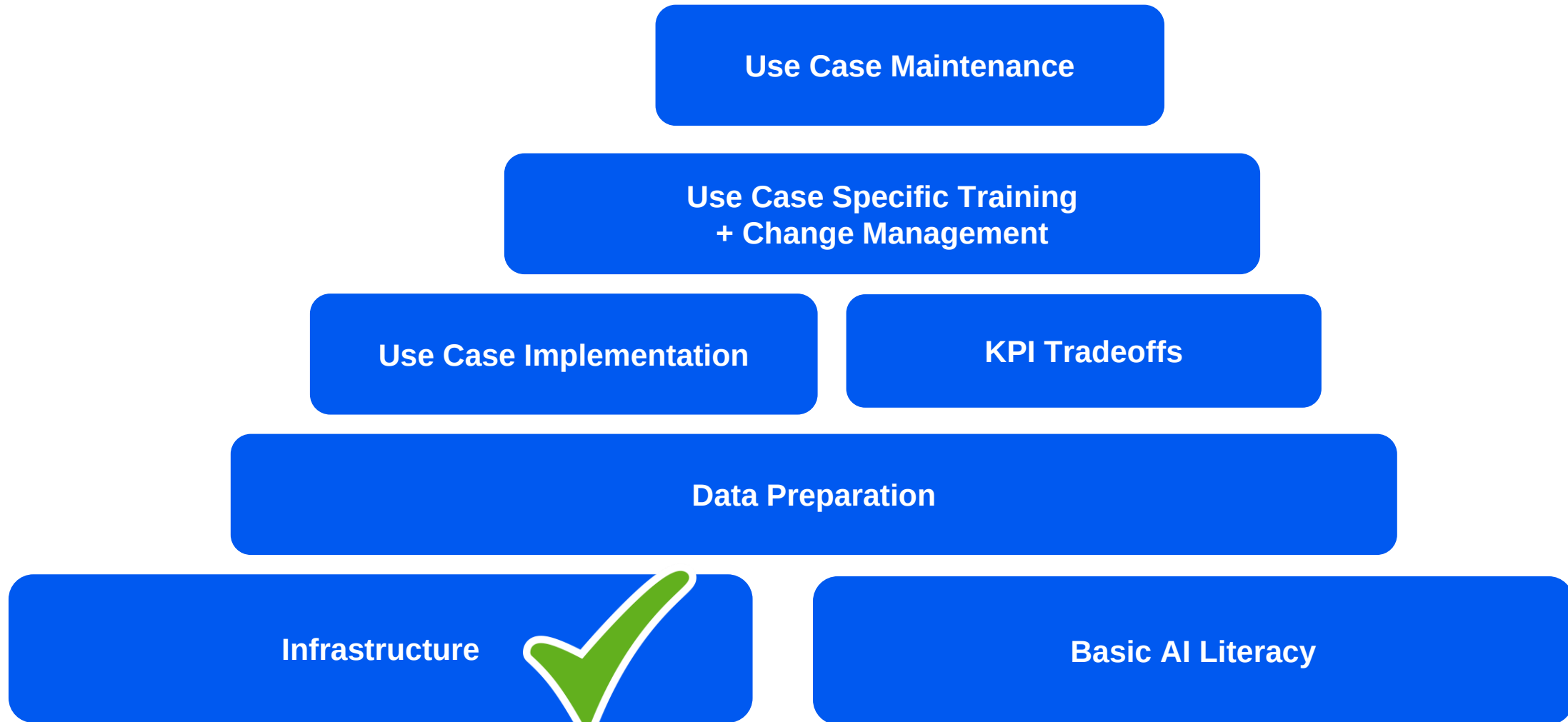


Infrastructure Sourcing: Self-Hosting vs SaaS

Which components do you run yourself — and which do you buy as a service?



Investment Areas of AI projects



AI Literacy/Trainings

Use Case cross-cutting

AI Task Force

- 1 person primarily responsible
Support from every business area
- Builds knowledge through external training
- Coordinates and administers AI initiatives

Promptathons

- Joint workshop
- Participants develop use cases themselves
- Results go straight into the use case library

Use Case specific

Training quotas with AI providers

- Free of charge
- Good for tool-specific details
- Mostly videos and interactive tutorials

Use Case Library

- Employees instantly know where to start
- Momentum from regular in-house training (externally supported)

Running Example: “Self-Hosting” Option

Organisation fixed costs/year (cross-use-case)

AI Lead
90 K € salary + 10 K € training

AI Core Team
20 K €

Hardware
240 € self-hosted N8N + 60,000 € IaaS server

Use Case 1 · Individualized Marketing

FIXED COSTS (one-time)

- Training and onboarding: **100 €/employee**
- Data connection & configuration: **50,000 €**

Total: 60,000 €

Calculated Return **80,000/year**

Use Case 2 · Invoice Scanning

FIXED COSTS (one-time)

- Training and onboarding: **50 €/employee**
- Data connection & configuration: **8,000 €**

Total: 50,000 €

Calculated Return **50,000/year**

Running Example: “LLM as a Service” Option

Organisation fixed costs/year (cross-use-case)

AI Lead
90 K € salary + 10 K € training

AI Core Team
20 K €

Hardware
240 € self-hosted N8N + ~~60,000 € IaaS server~~

Use Case 1 · Individualized Marketing

FIXED COSTS (one-time)

- Training and onboarding: **100 €/employee**
- Data connection & configuration: **50,000 €**

Total: 60,000 €

ANNUAL OPERATION

- Token: **50 €/month/employee (20 employees)**
- Total: 12,000 €**

Calculated Return **80,000/year**

Use Case 2 · Invoice Scanning

FIXED COSTS (one-time)

- Training and onboarding: **50 €/employee**
- Data connection & configuration: **8,000 €**

Total: 50,000 €

ANNUAL OPERATION

- Token: **15 €/month/employee (200 employees)**
- Total: 36,000 €**

Calculated Return **50,000/year**



Running Example: 'Software as a Service' Option

Organisation fixed costs/year (cross-use-case)

AI Lead

~~90 K € salary + 10 K € training~~

AI Core Team

20 K €

Hardware

~~240 € self-hosted N8N + 60,000 € IaaS server~~

Use Case 1 · Individualized Marketing

FIXED COSTS (one-time)

- Training and onboarding: 100 €/employee
- Data connection & configuration: 10,000 €

Total: 12,000 €

ANNUAL OPERATION

- License: 100 €/month/employee (20 employees)
- Total: 24,000 €

Calculated Return **80,000/year**

Use Case 2 · Invoice Scanning

FIXED COSTS (one-time)

- Training and onboarding: 50 €/employee
- Data connection & configuration: 1,000 €

Total: 11,000 €

ANNUAL OPERATION

- Token: 20 €/month/employee (200 employees)
- Total: 48,000 €

Calculated Return **50,000/year**

Does my AI project pay off?

Option 1: Self-Hosting

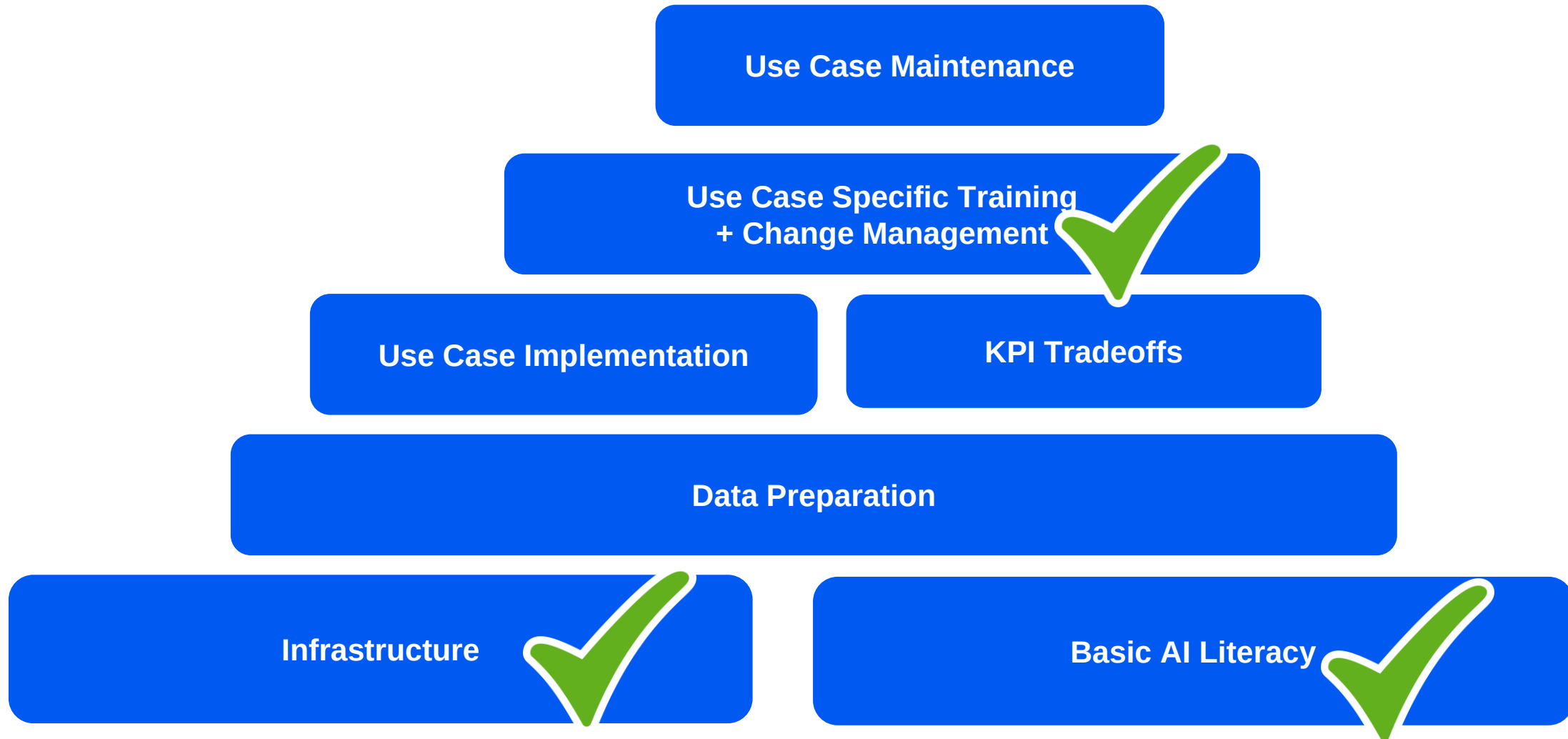
$$\text{ROI (3 years)} = \frac{(130,000 - \dots) \times 3}{180,240 \times 3 + 60,000 + 50,000} = 60 \%$$

Option 2: LLM as a Service

$$\text{ROI (3 years)} = \frac{\text{Profit over assessment period}}{\text{Investment costs}} = 63 \%$$

$$\text{ROI (3 years)} = \frac{\text{Profit over assessment period}}{\text{Investment costs}} = 63 \%$$

Investment Areas of AI projects

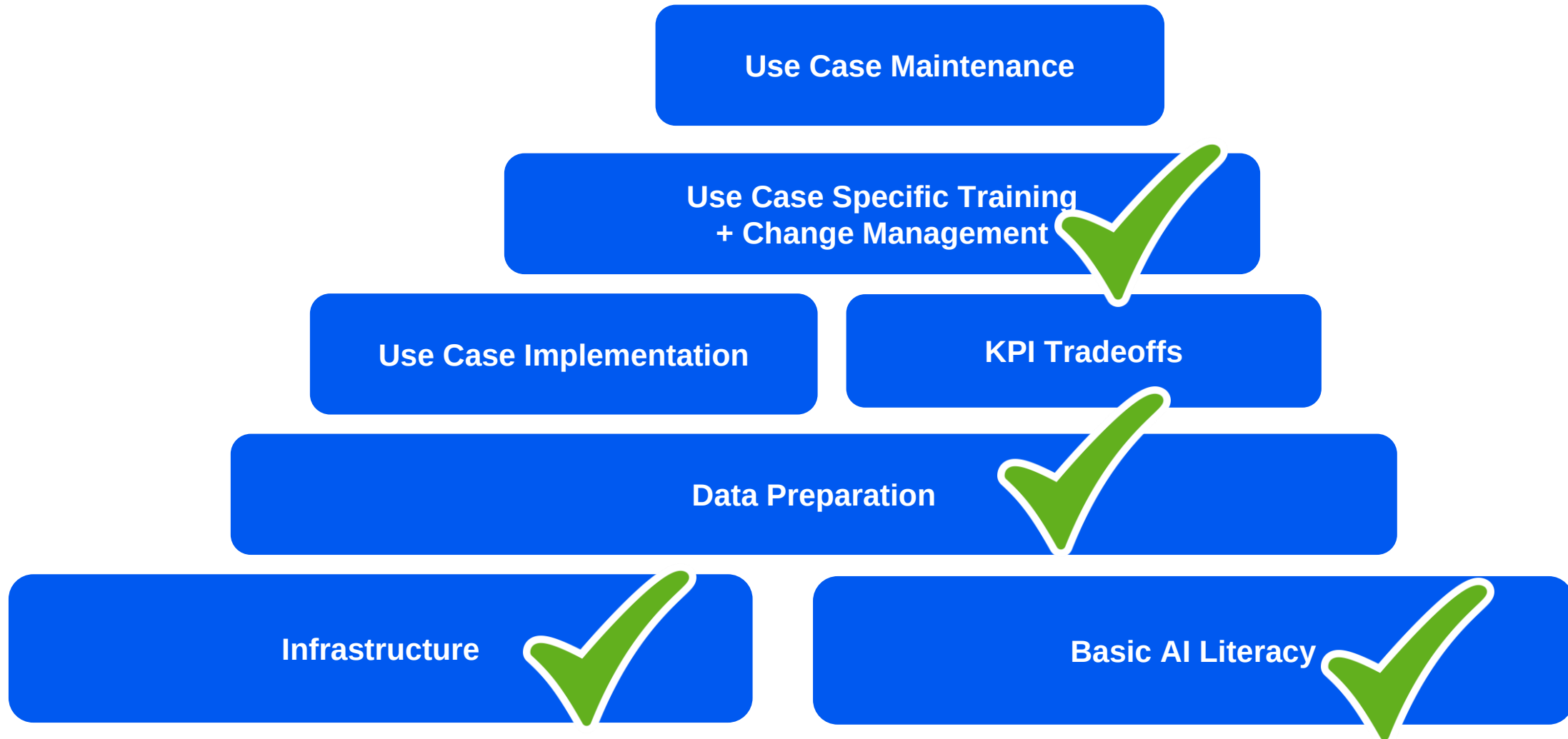


Data Preparation

How to close Gaps in my Data Map?

What are requirements of my specific use case?

Investment Areas of AI projects



Can we do it in-house?



Search

- Which tools are already out there? <https://theresanaiforthat.com/>
- To which extent can these tools satisfy my requirements?

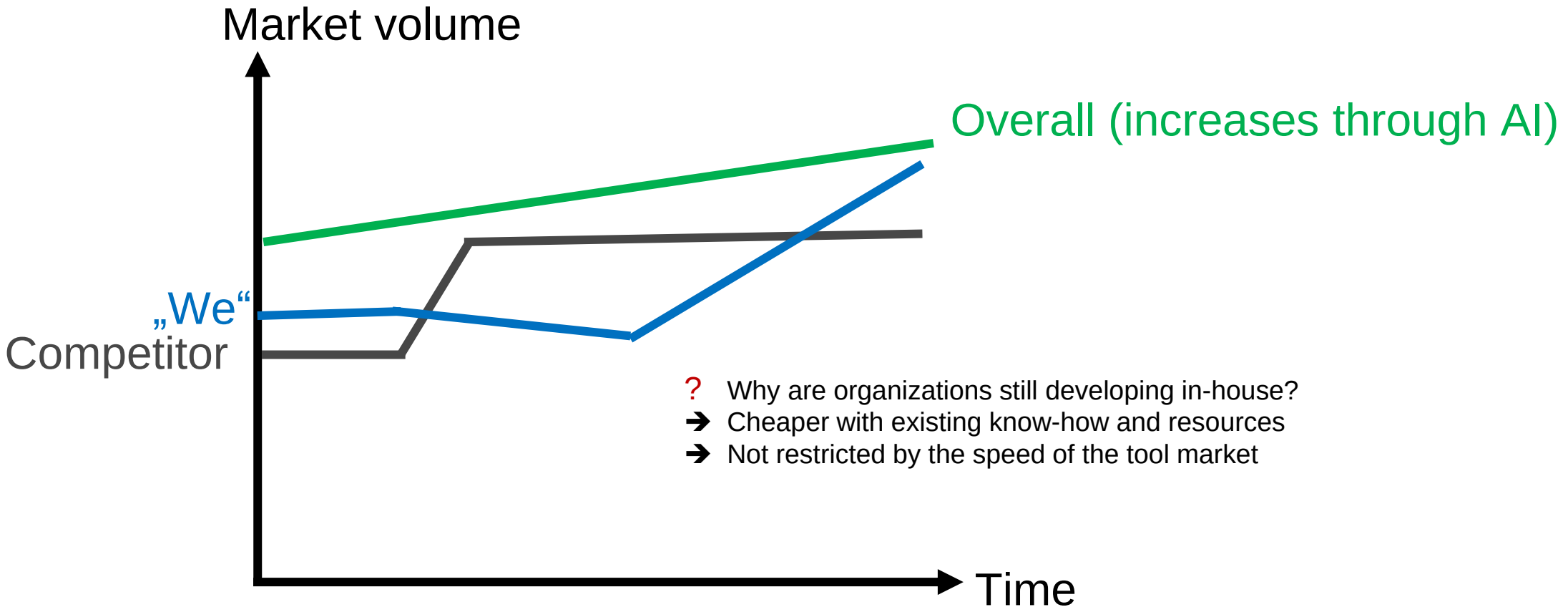
Ask

- What know-how do I need for in-house development?
- Is this know-how already available?
- How can we acquire required know-how?

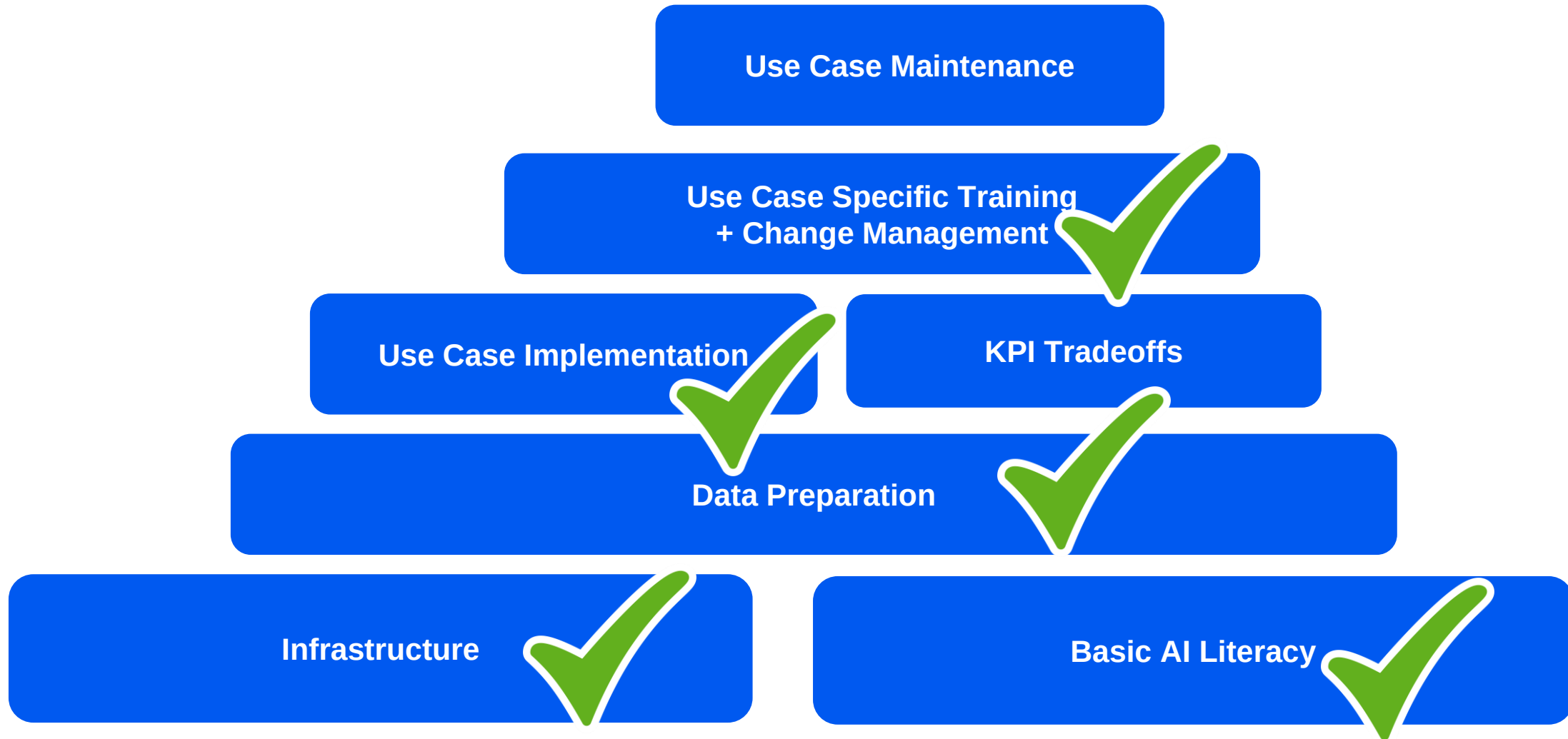
Collect

- Result: list of options

Opportunity Costs of In-House Development



Investment Areas of AI projects



ROI Calculation



Perform an ROI analysis for your selected AI project(s)
Perform sensitivity analysis
Decide on an implementation strategy for your AI project(s)



Duration: 30 Minutes
Use template on training page
Work in groups of 5, 15 Minutes presentation/discussion afterwards

Key Takeaways

1

AI methods + use cases

2

AI project identification

3

Is my data ready?

4

ROI Analysis + Sourcing Strategies

Contact

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and Infrastructure
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under discussion with



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