

Strategic Thinking on four levels of AI

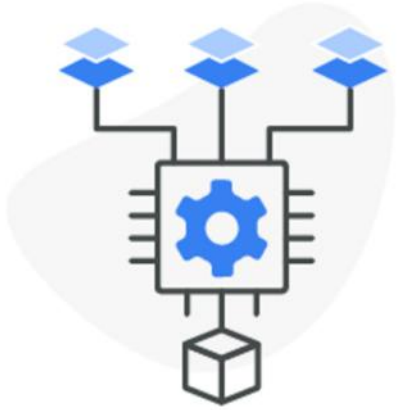
Stefan Michel, Professor of Management
Dean of Faculty and Research

IMD / Real learning
Real impact

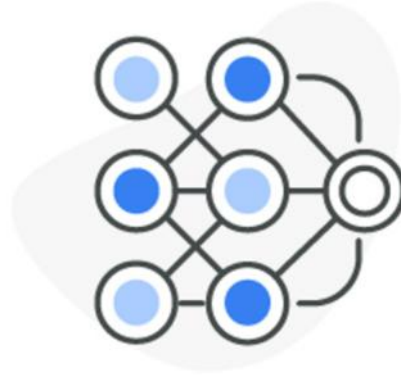


Four managerial relevant categories of AI

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Expert systems



Single-purpose
Machine Learning



Generative AI



AI Agents

The most productive use cases here are

Today, the hype is here

... and tomorrow here

The biggest misunderstanding about artificial intelligence is confusing technological disruption with economic disruption

Peter Drucker, 1909-2005

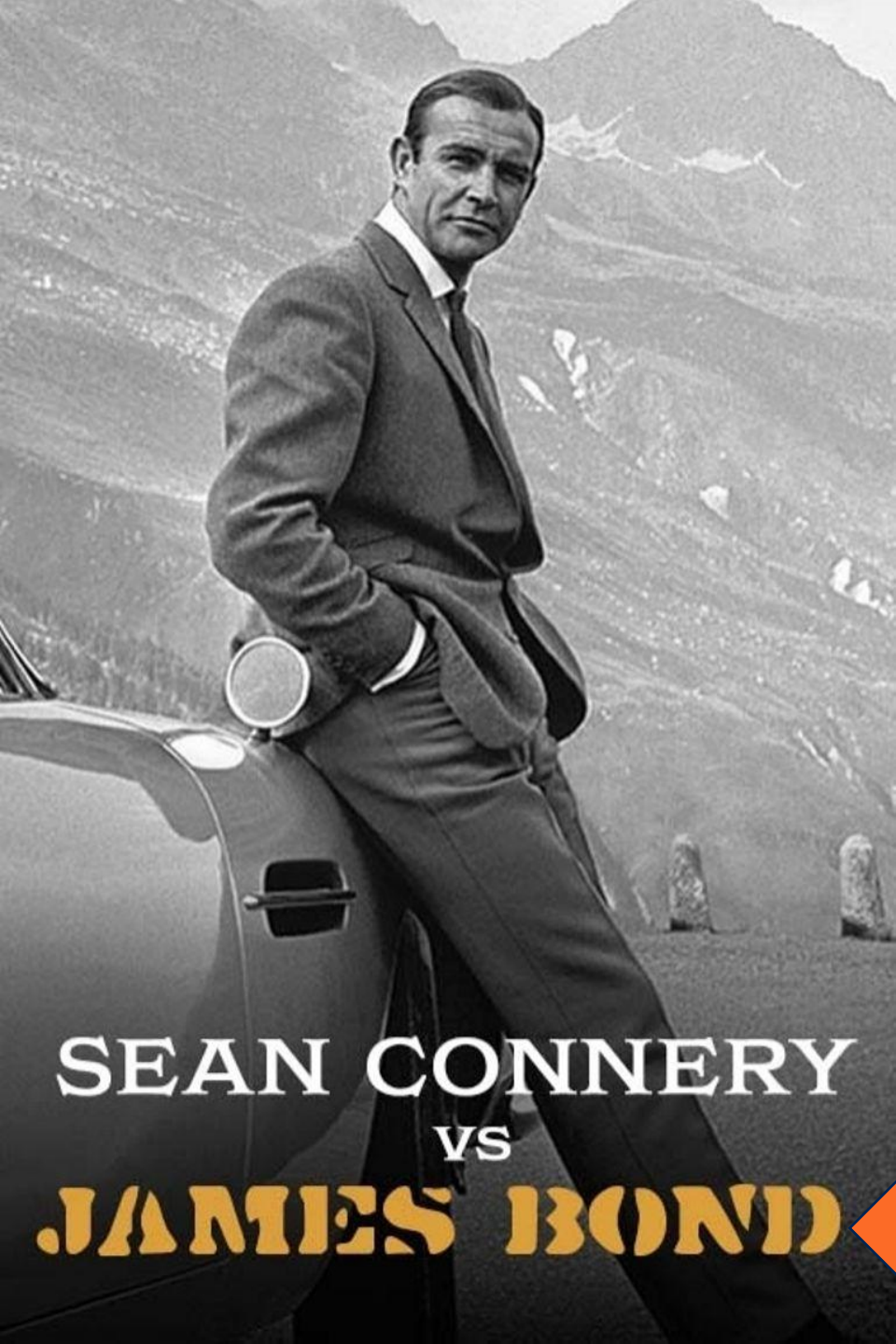
The biggest misunderstanding about digital disruption is confusing technological disruption with economic disruption

Peter Drucker, 1909-2005 Stefan Michel





Agents

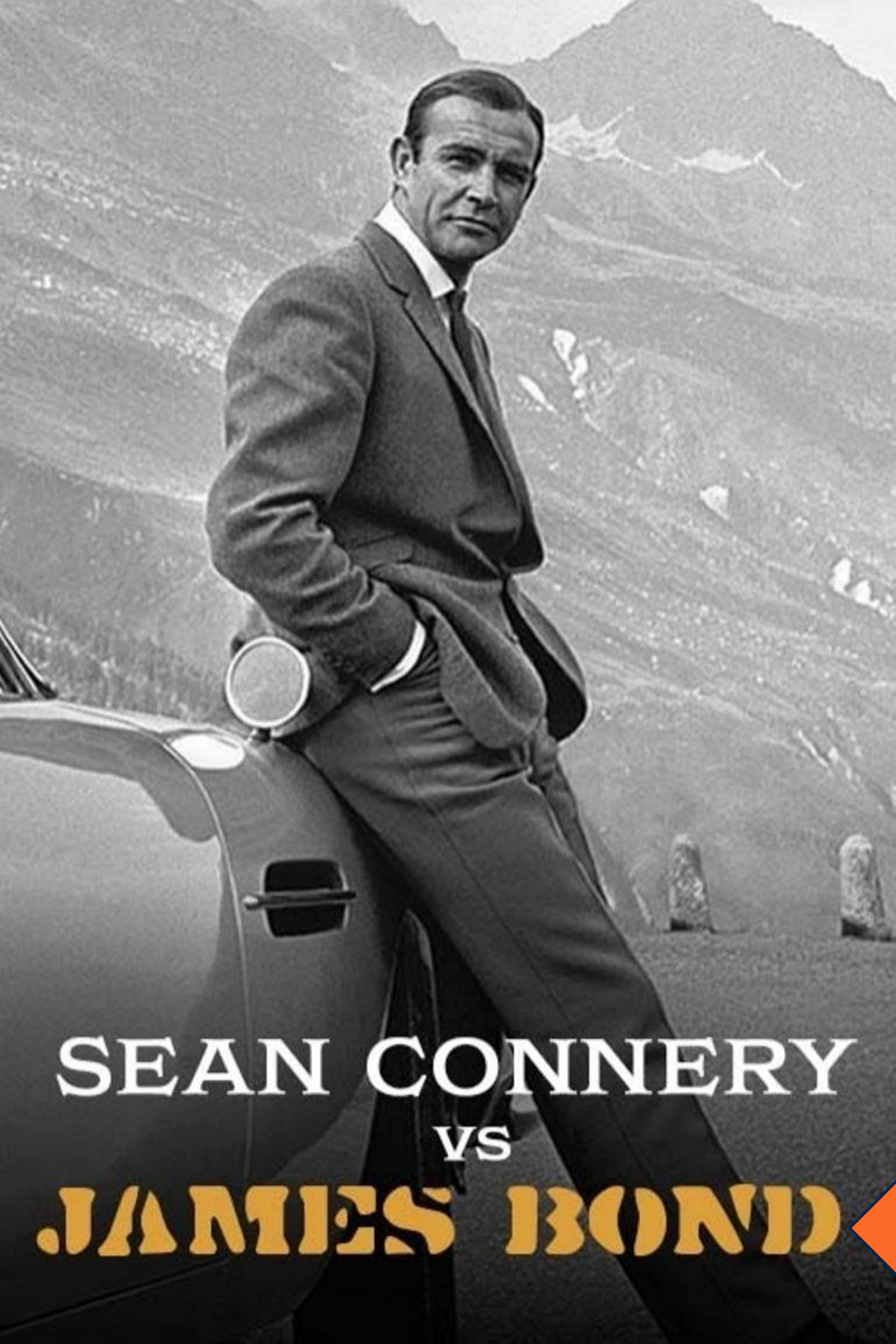


SEAN CONNERY
VS
JAMES BOND

Not this agent

Agents

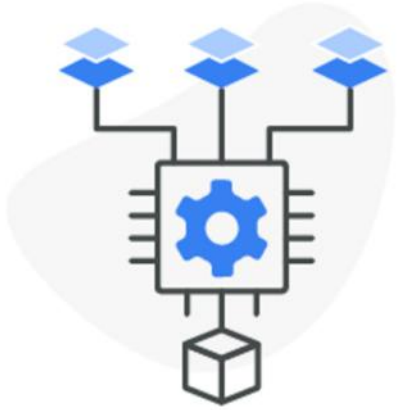
- Think of them as "smart" assistants within the LLM.
- LLM agents are AI systems that can generate text like a chatbot, take actions, use tools, and even plan complex tasks to achieve a goal.
- They have a modular structure. This typically includes:
 - LLM as the brain: The core language model that provides reasoning and decision-making capabilities.
 - Memory: To store and recall information from past interactions or tasks.
 - Tools: Access to external resources like search engines, calculators, or databases to gather information or perform actions.
 - Planner: To break down complex goals into smaller steps and determine the best course of action.



Not this agent

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Expert systems

If-then algorithms

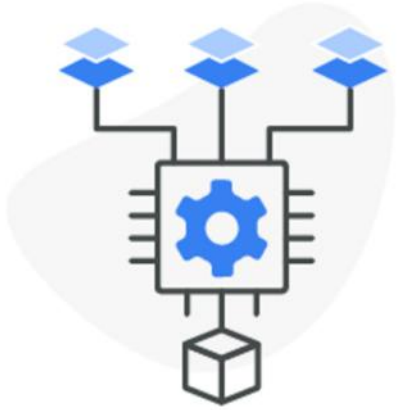
Tax form

Property valuation

Solve a problem without
independent learning

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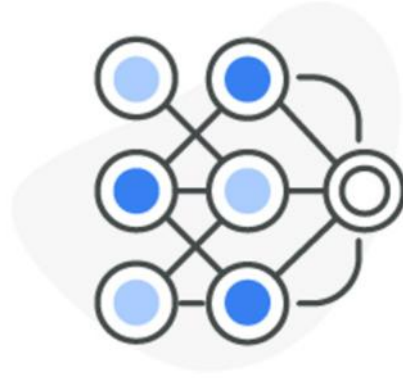
Expert systems

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Single-purpose Machine Learning

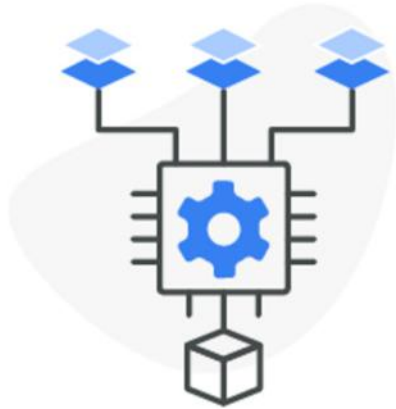
Face recognition

Inventory planning

Solving a problem with
independent learning

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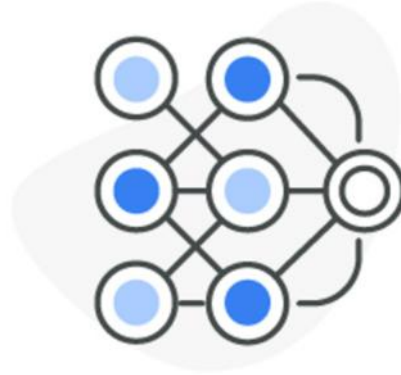
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Solve a problem without
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Single-purpose Machine Learning

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Generative AI

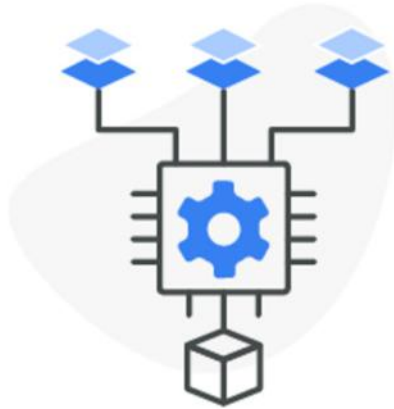
GPT (Transformers)

Creating texts, code,
presentations, videos

Solving various problems
with independent learning

Four managerial relevant categories of AI

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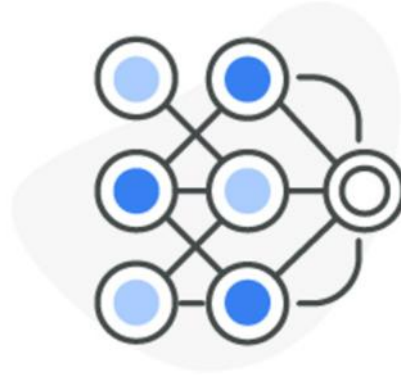
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Single-purpose Machine Learning

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AI Agents

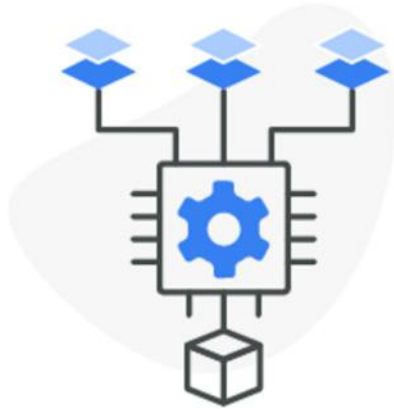
Combination of AI and
automation tools

Travel planning, budgeting,
bookings, etc.

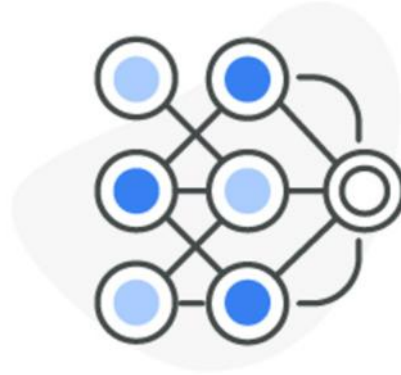
Learn and act
independently

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Expert systems
If-then algorithms



Single-purpose
Machine Learning



Generative AI
GPT (Transformers)



AI Agents
Combination of AI and
automation tools

Where are you standing on this?

“

I am convinced that Roy Amara's law applies to AI as “we overestimate the changes in the short term but underestimate the impact in the long term.”

Stefan Michel

Strategic challenges of AI

1. Exponential breakthroughs
2. End of scenario planning
3. Ambiguity and lack of common understanding
4. Strategic scoping of AI

Strategic challenges of AI

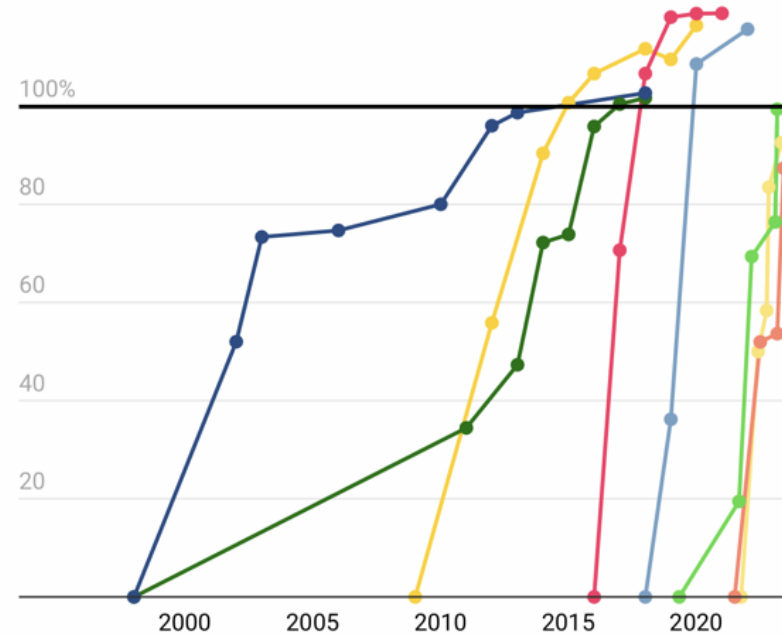
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Exponential growth in technology leads to unpredictable results

AI has surpassed humans at a number of tasks and the rate at which humans are being surpassed at new tasks is increasing

State-of-the-art AI performance on benchmarks, relative to human performance

● Handwriting recognition ● Speech recognition ● Image recognition
● Reading comprehension
● Language understanding ● Common sense completion ● Grade school math
● Code generation



For each benchmark, the maximally performing baseline reported in the benchmark paper is taken as the "starting point", which is set at 0%. Human performance number is set at 100%. Handwriting recognition = MNIST, Language understanding = GLUE, Image recognition = ImageNet, Reading

ChatGPT recipe for Lasagne Hawaii

Ingredients

• For the Lasagne:

- 9-12 lasagne noodles (depending on pan size)
- 2 cups cooked ham, diced
- 1 1/2 cups pineapple chunks, drained
- 3 cups shredded mozzarella cheese
- 1 cup grated Parmesan cheese

• For the Bechamel Sauce:

- 4 tablespoons unsalted butter
- 1/4 cup all-purpose flour
- 3 cups milk
- Salt, to taste
- Pepper, to taste
- Nutmeg, a pinch (optional)

• For the Tomato Sauce:

- 2 tablespoons olive oil
- 1 small onion, finely chopped
- 2 garlic cloves, minced
- 1 can (28 ounces) crushed tomatoes
- 1 teaspoon dried oregano
- Salt and pepper, to taste

Instructions

1. Preheat Oven and Prepare Noodles:

- Preheat your oven to 375°F (190°C).
- Cook the lasagne noodles according to package instructions until al dente, then drain and set aside.

2. Make the Bechamel Sauce:

- In a saucepan, melt the butter over medium heat.
- Stir in the flour and cook for 1-2 minutes until the mixture becomes a light golden color.
- Gradually whisk in the milk, ensuring no lumps form.
- Cook until the sauce thickens and comes to a gentle boil. Add salt, pepper, and a pinch of nutmeg. Set aside.

3. Prepare the Tomato Sauce:

- Heat the olive oil in a separate saucepan over medium heat. Add the onion and garlic, sautéing until soft.
- Add the crushed tomatoes, oregano, salt, and pepper. Simmer for 15-20 minutes until the sauce thickens slightly. Remove from heat.

4. Assemble the Lasagne:

- Spread a thin layer of tomato sauce at the bottom of a 9×13 inch baking dish.
- Layer 3-4 lasagne noodles over the sauce.
- Spread a layer of bechamel sauce over the noodles, followed by a layer of ham and pineapple chunks.
- Sprinkle a layer of mozzarella and a little Parmesan cheese.
- Repeat the layers until all ingredients are used, finishing with a layer of cheese on top.

5. Bake:

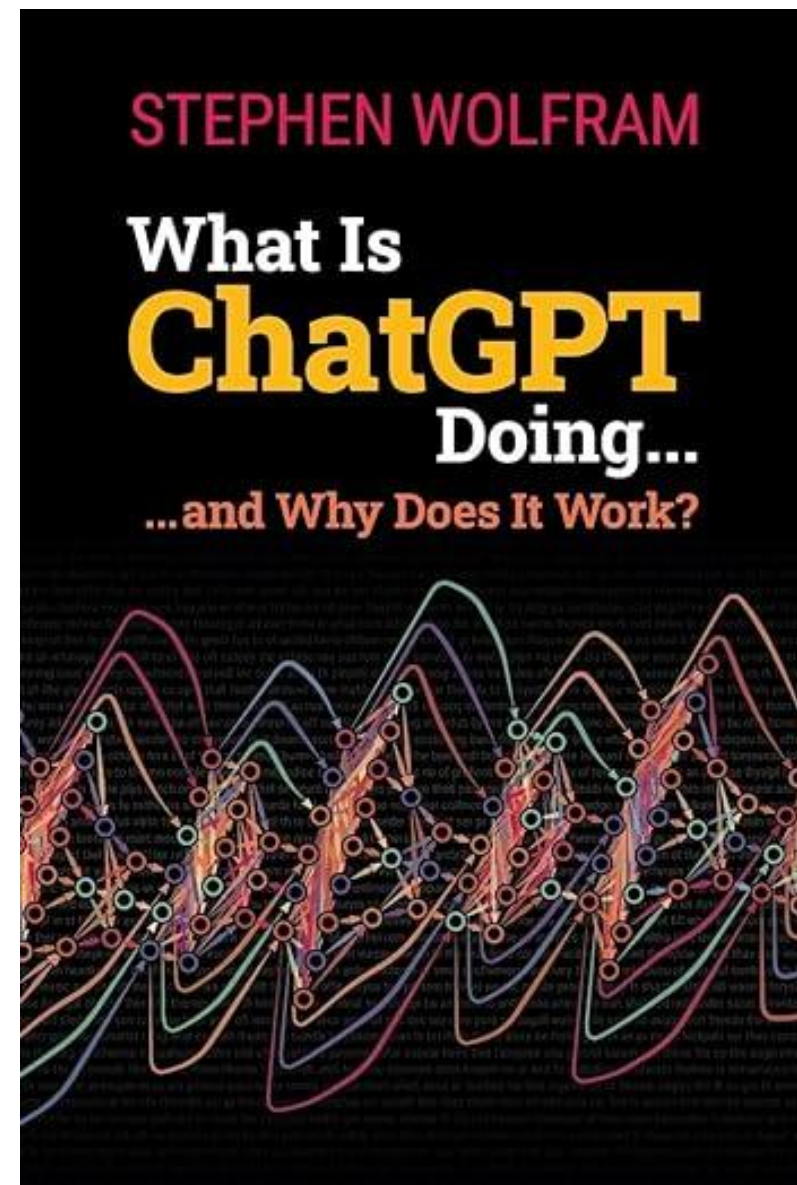
- Cover the dish with aluminum foil and bake for 25 minutes.
- Remove the foil and bake for an additional 10-15 minutes, or until the top is golden and bubbly.

6. Serve:

- Let the lasagne sit for 10 minutes before cutting into it. This allows the layers to set and makes it easier to serve.
- Enjoy your Hawaiian-inspired lasagne hot!

“The most interesting fact about a lasagne recipe with pineapple and ham is that **nobody** programmed ChatGPT to perform such a task.

Professor Stefan Michel, IMD
(son of a chef who asked me not to
become a chef)



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24 trends to watch

Quantum Computing

Edge Computing

5G and Advanced Network Technologies

Internet of Things (IoT)

Blockchain Technology

Augmented Reality (AR) and Virtual Reality (VR)

Cloud Computing Advancements

Big Data Analytics

Advanced Machine Learning Algorithms

Neuromorphic Computing

Cybersecurity Innovations

Autonomous Vehicles

Natural Language Processing (NLP)

Robotics and Automation

Advanced Semiconductor Technologies

Biometric Technology

Energy-Efficient Computing

Digital Twins

AI in Healthcare (e.g., Precision Medicine)

Human-AI Collaboration Tools

AI Ethics and Governance

Deep Learning and Neural Networks

Advanced Predictive Analytics

Wearable Technology and Personal AI

Smart Cities Technologies

k=1: $C(24,1)=24$
k=2: $C(24, 2) = 276$
k=3: $C(24, 3) = 2,024$
k=4: $C(24, 4) = 10,626$
k=5: $C(24, 5) = 42,504$
k=6: $C(24, 6) = 134,596$
k=7: $C(24, 7) = 346,104$
k=8: $C(24, 8) = 735,471$
k=9: $C(24, 9) = 1,307,504$
k=10: $C(24, 10) = 1,961,256$
k=11: $C(24, 11) = 2,496,144$
k=12: $C(24, 12) = 2,704,156$
k=13: $C(24, 13) = 2,496,144$
k=14: $C(24, 14) = 1,961,256$
k=15: $C(24, 15) = 1,307,504$
k=16: $C(24, 16) = 735,471$
k=17: $C(24, 17) = 346,104$
k=18: $C(24, 18) = 134,596$
k=19: $C(24, 19) = 42,504$
k=20: $C(24, 20) = 10,626$
k=21: $C(24, 21) = 2,024$
k=22: $C(24, 22) = 276$
k=23: $C(24, 23) = 24$
k=24: $C(24, 24) = 1$

How many trends should we observe?

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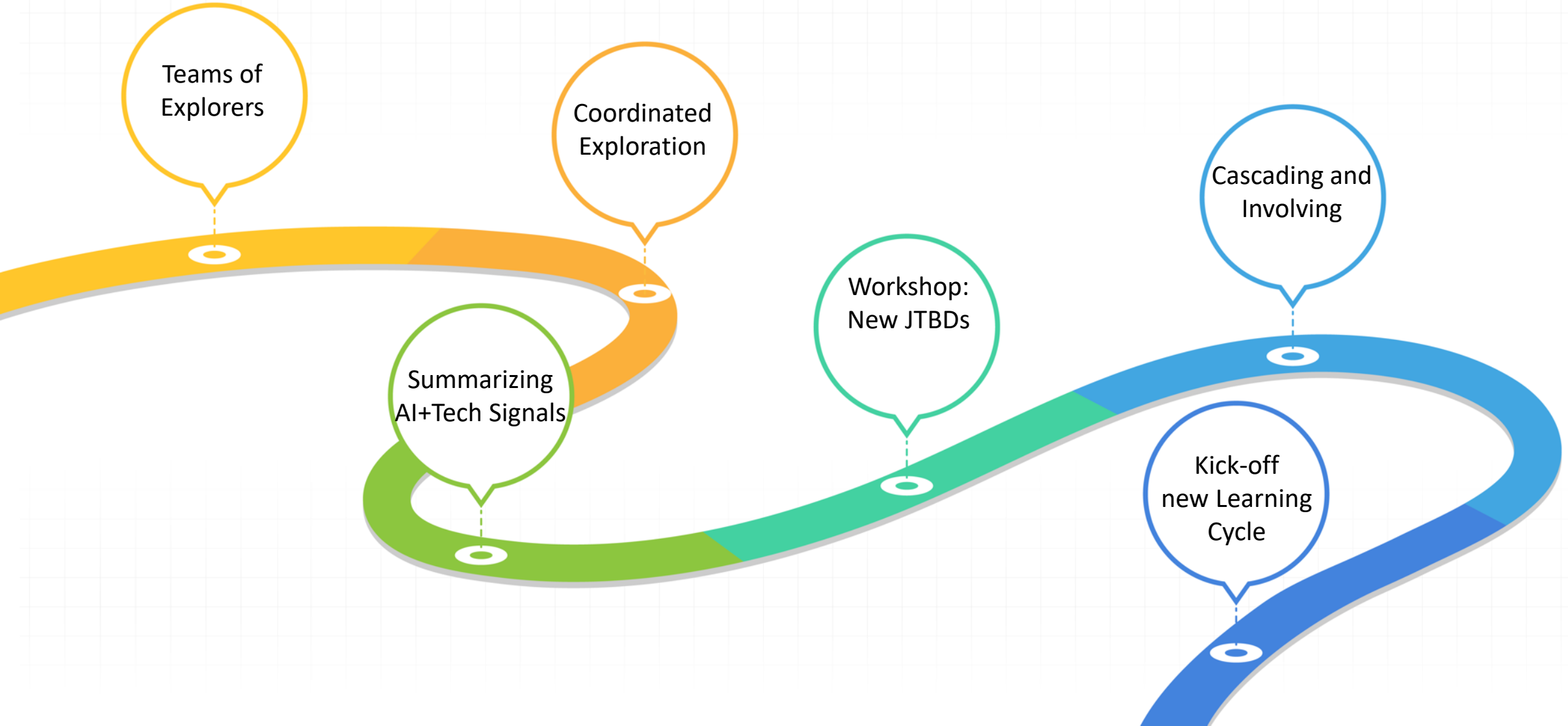
ways to combine 24 trends

Exploration is the act of searching, investigating, and discovering new places, knowledge, or experiences.

Exploration is driven by curiosity and the desire to understand and interact with the world around us. It's essential for human progress as it often leads to new insights, innovations, and connections



Learning and exploring roadmap



Strategic challenges of AI

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AI is
automation

?

More risks,
less ROI

AI is a tool

*..nothing
really new*



1

Most executive and non-executive boards do not share a common understanding, a **common perspective**, of AI and what it could mean for their organization.

2

AI can be framed as a tool, a software, a co-pilot, a co-worker, an accelerator of data analytics and automation, an all-encompassing organizational productivity improvement or a threat to society, democracy and humanity. None of these frames are wrong, and they are not mutually exclusive.

3

Without a shared frame or perspective, decision-makers face significant challenges in agreeing on **evaluation criteria** and **prioritizing AI initiatives**.

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Strategy as Decision Making



Strategy with AI as Decision Making

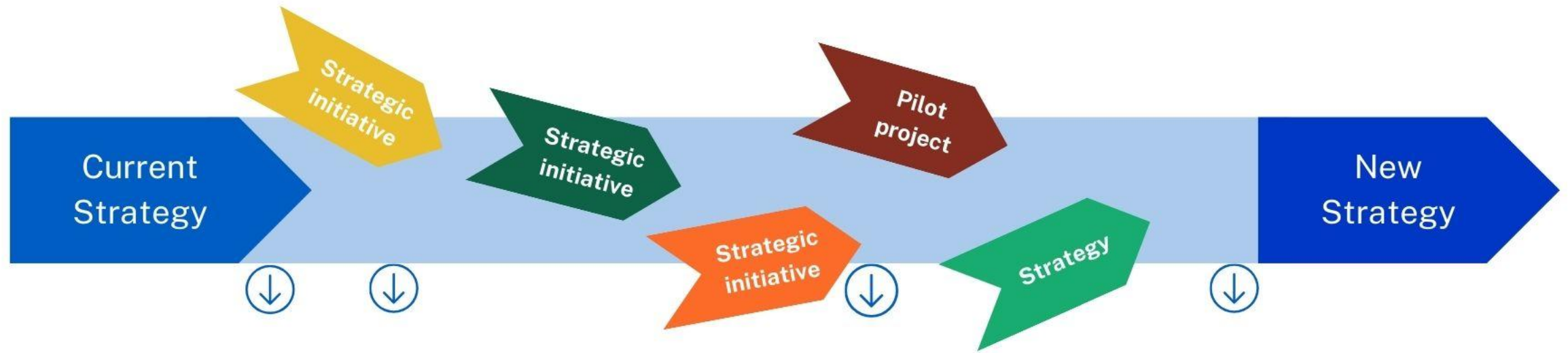


“
Everyone has a plan until they get punched in the face



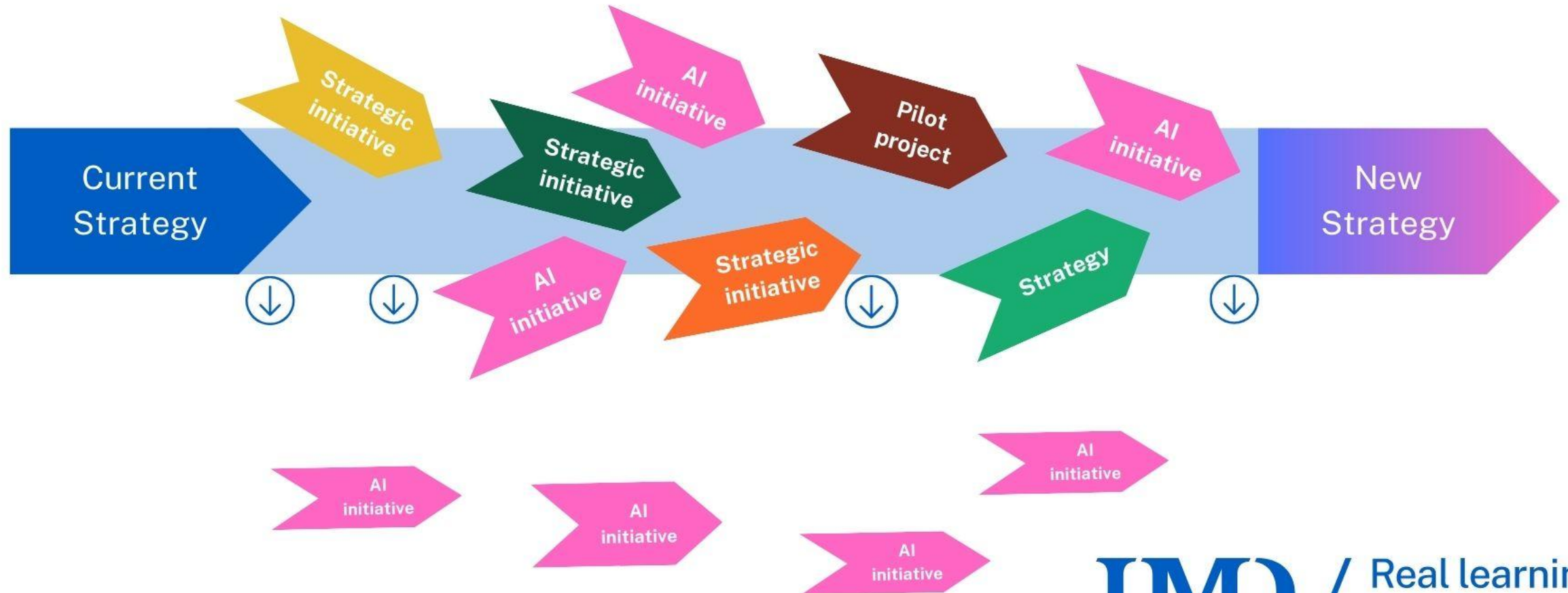
Strategy as a learning process

Initiatives emerge and are abandoned



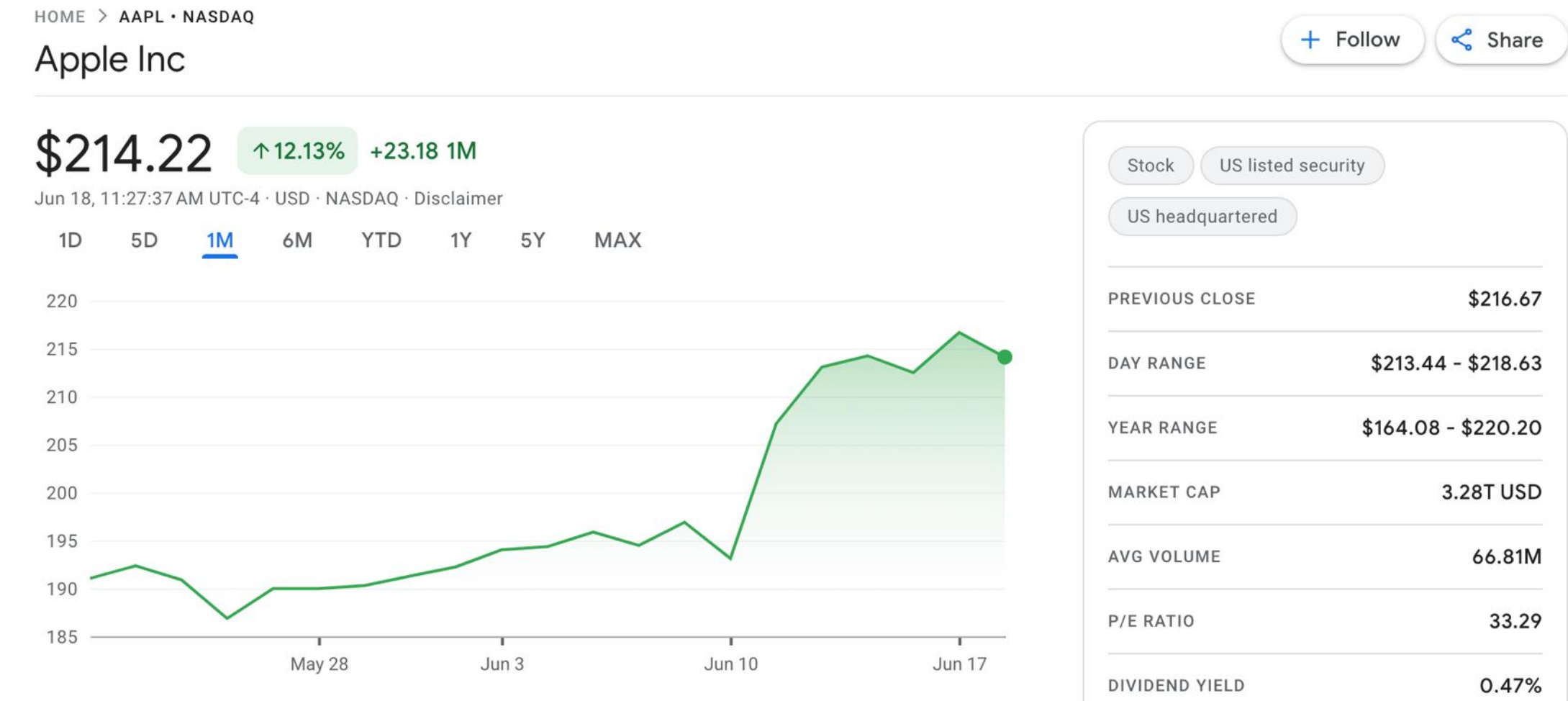
Strategy as a learning process

Strategic AI initiatives emerge while some remain operational



Apple Intelligence presented at WWDC on June 10, 2024:

The share price increased 12.2%= Mkt cap +\$360b in 1 week



Apple's AI strategy?
Not a big bang, but a
series of customer-focused
use cases.


A more personal Siri



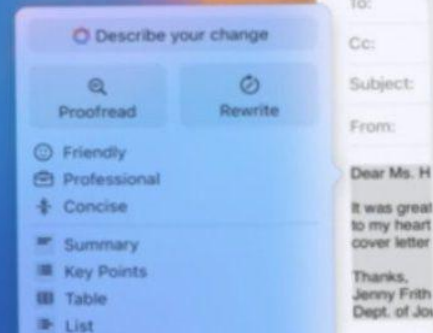
Private Cloud Compute



 **Clean Up
in Photos**

 **Summaries
in Messages**

**Writing
Tools**



 **Reduce Interruptions**

in Focus

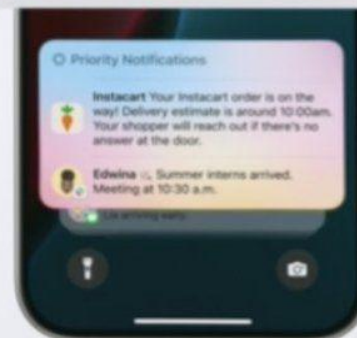
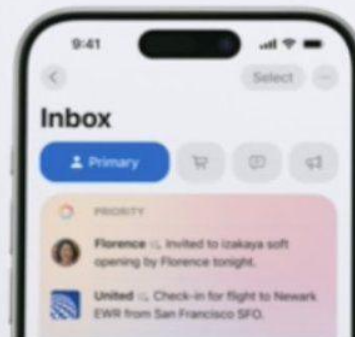
Apple Intelligence

Image Playground



Genmoji

Priority messages in Mail



Priority notifications

Image Wand





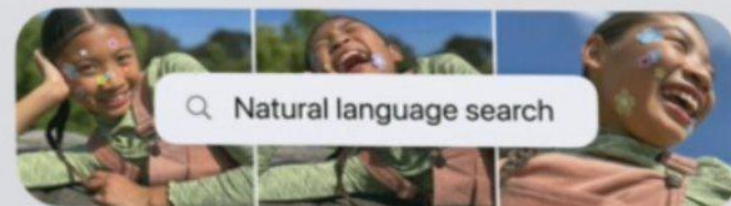
Audio recording



summaries

Create a Memory Movie

 Describe a Memory... 



Approach AI not as
technological challenge,
but as a strategic
opportunity





Lessons learned for AI strategies



- 1** Start with the customer. Understand how AI will change their industry and their customers' behavior.
- 2** Invest in your employees' learning journeys. AI will change not only their jobs, but also their lives, and it will change society. Invest in your learning journey.
- 3** Insights from data will make the difference. Create teams of explorers. Observe startups very closely.
- 4** Integrate your AI use cases in your company's strategy. Understand all four levels of AI— they are very different.