

Fellowwind


We used to be **recraft**
Now we are **Fellowwind**

Mycronic blir ett connected company genom DataHub

Nicklas Andersson // Fellowmind

Fellowmind at a glance

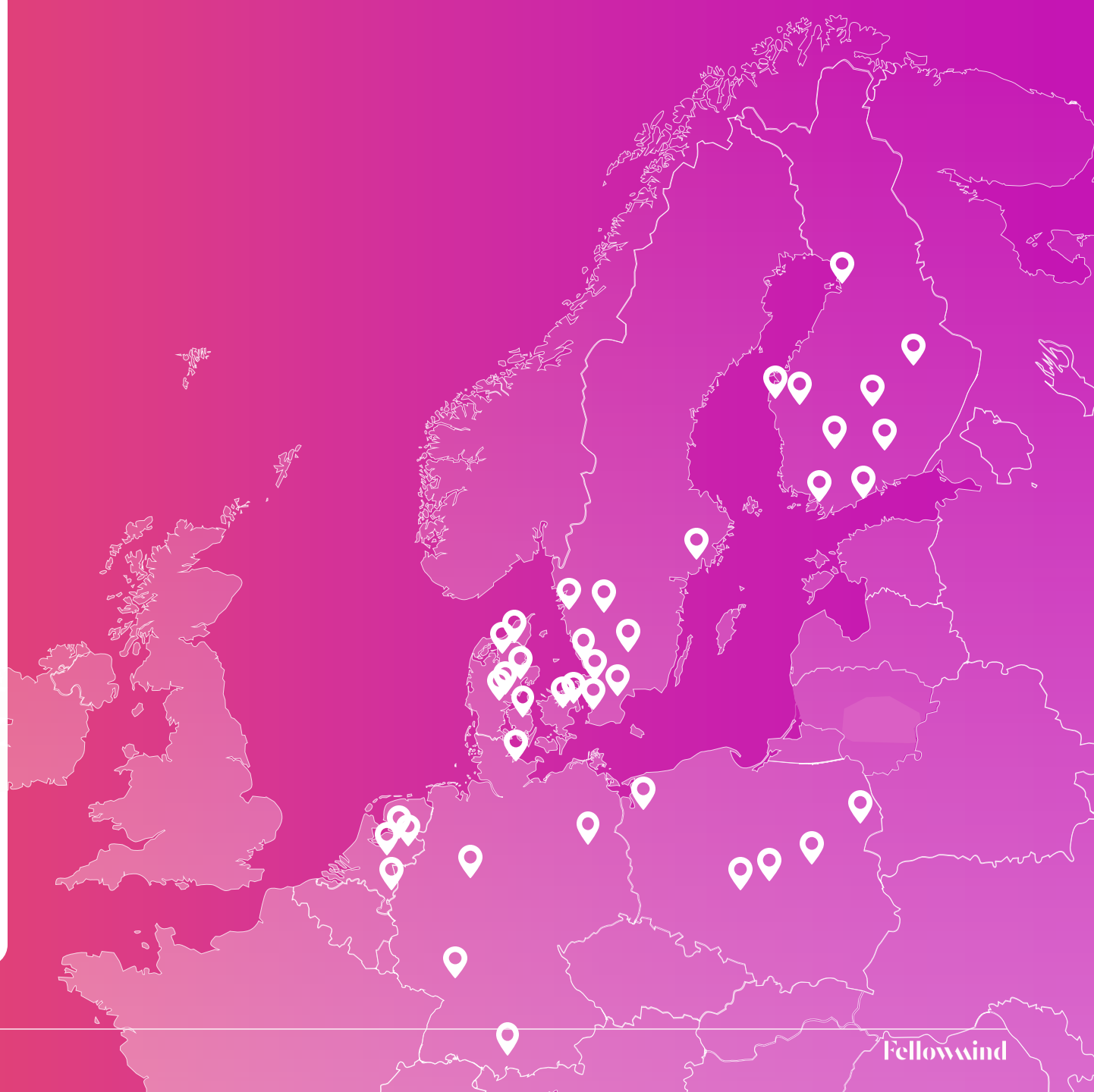
Big enough to cope, small
enough to care.

 // ~2,100 employees

 // 6 countries

 // 40 offices

 // 299 MEUR Revenue (2022)





Nicklas Andersson

nicklas.andersson@fellowmind.fi

+46 70 228 3710

Fellowmind Finland

Fellowmind

in brief



More than 40 years

in more than 50 countries

is proven by more than 500 patents

More than 1,900 employees

at more than 5,500 customers

Mycronic's **four divisions**



Pattern Generators

Display
Semiconductor



Assembly Solutions High Flex

Medical
Industrial
Aerospace & Defense



Assembly Solutions High Volume

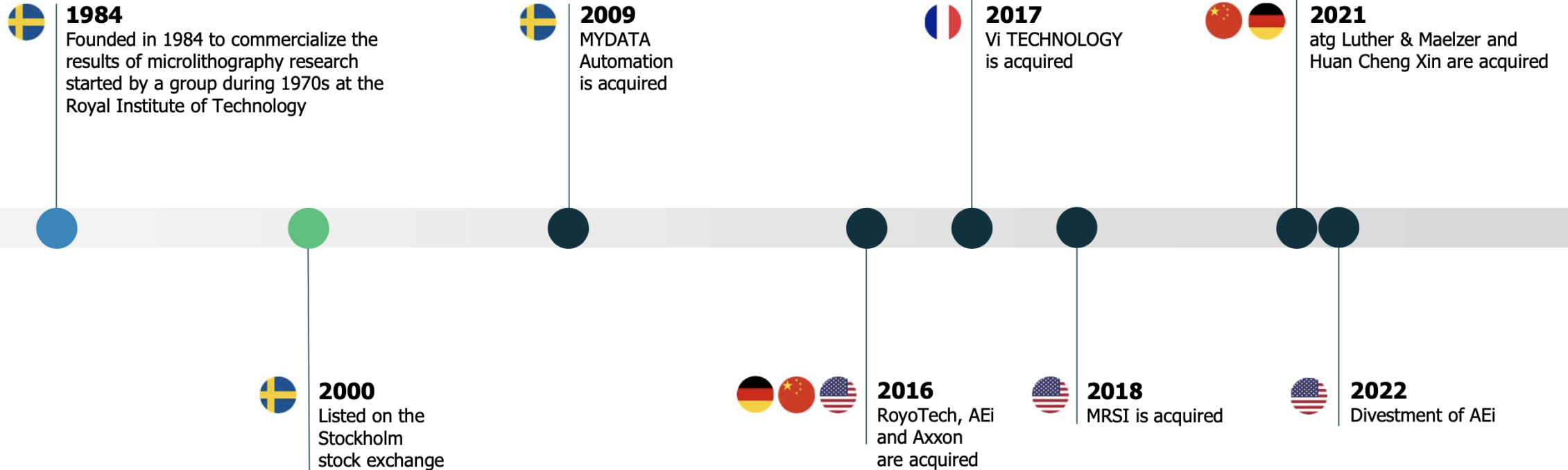
Mobile
Computer
Semiconductor
Automotive
Consumer



Global Technologies

Telecom/Datacom
Aerospace & Defense
Automotive
Medical
Mobile
Semiconductor

Mycronic's history begins in the 1970s

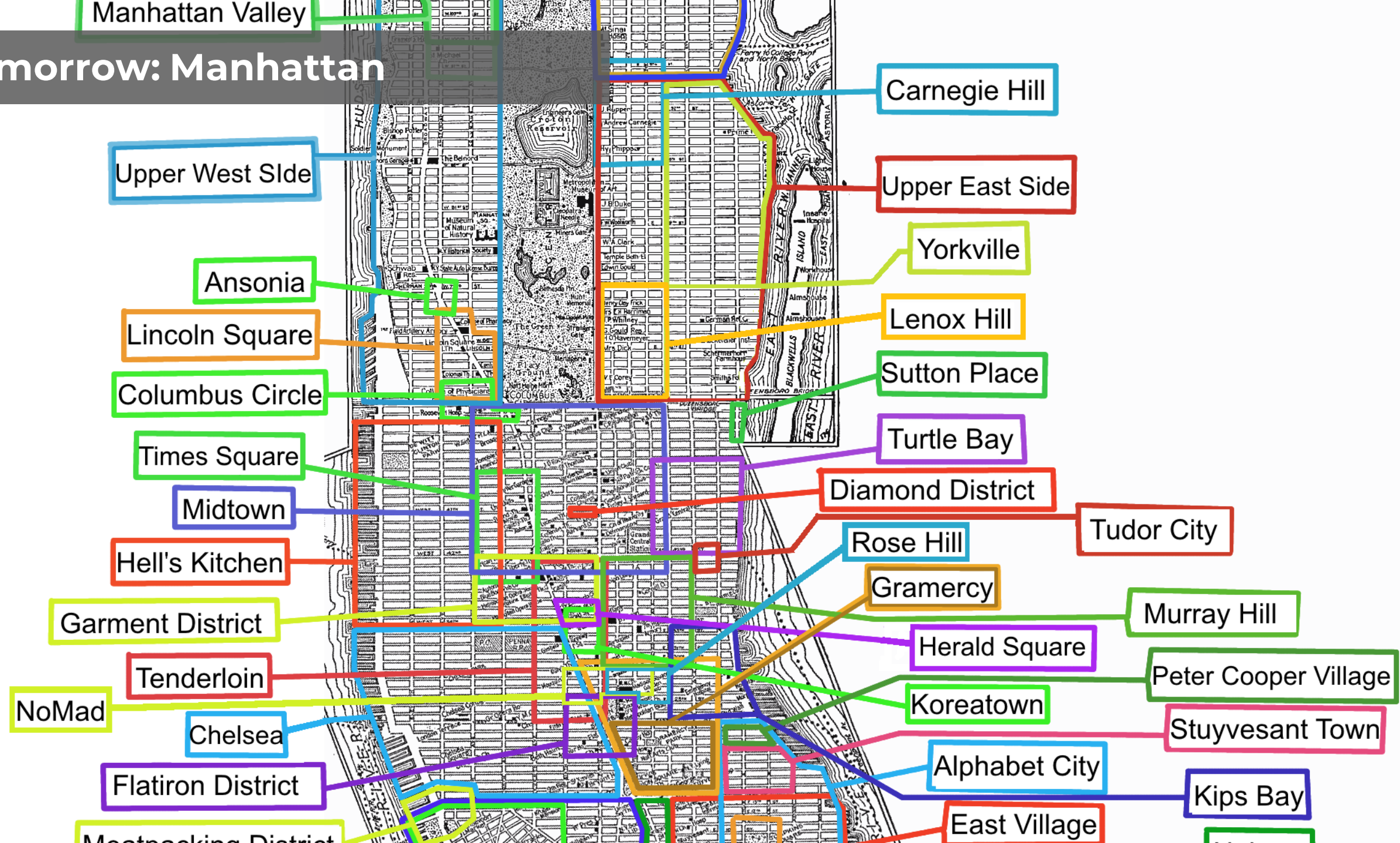


Today: Favelas in Rio de Janeiro



Manhattan Valley

Tomorrow: Manhattan



Data, analytics, and BI projects in general are not exactly a success story.

**Neither are
integration projects.**

**Not enough companies
are doing AI or ML stuff.**

**How do you need
to think about data?**

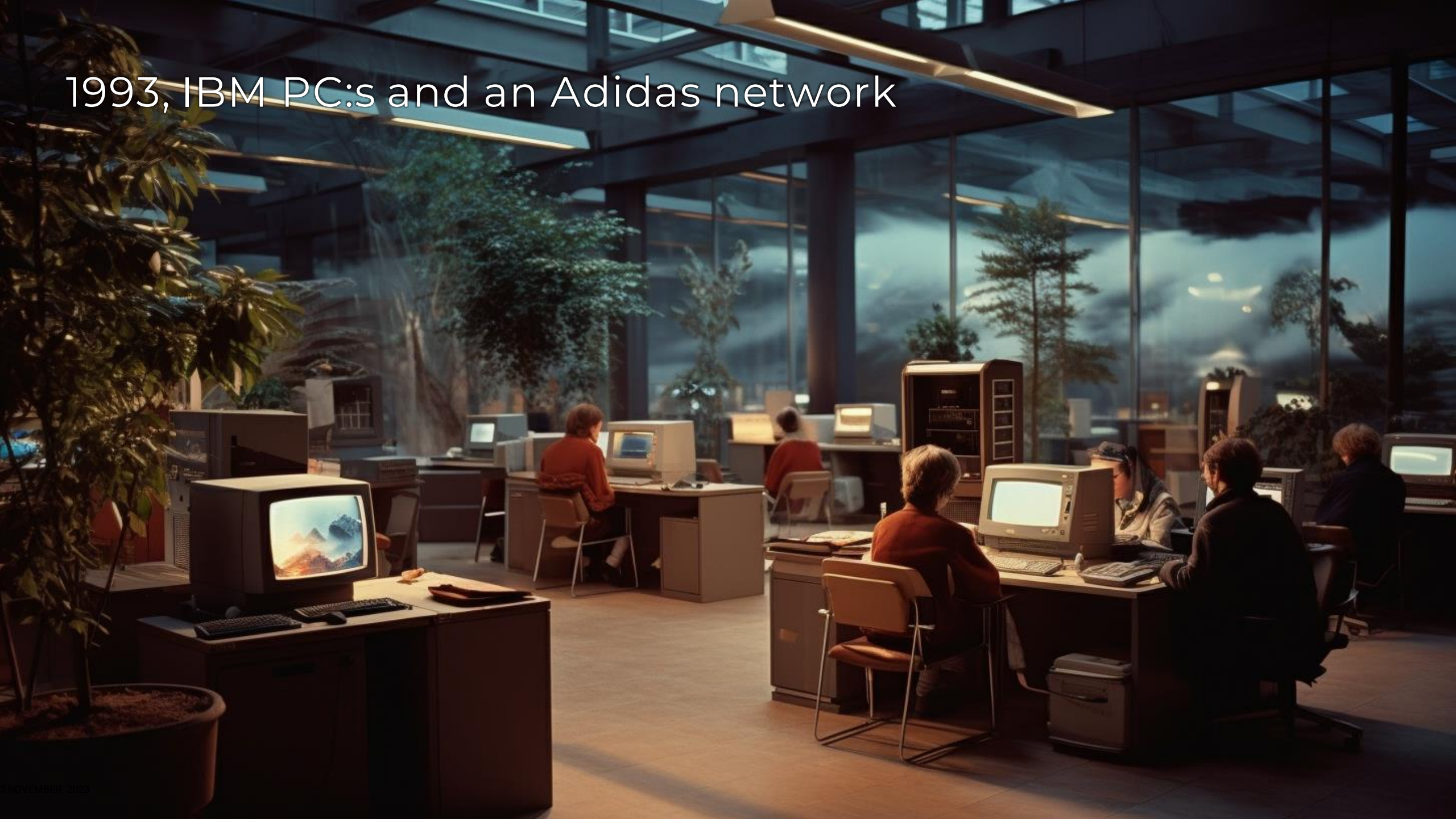
Soon all data will be real-time



Why am I qualified to speak here today?

A man in a dark suit stands at the front of a large lecture hall, facing a vast audience of students seated in tiered rows. He has his back to the camera, gesturing with his hands as he speaks. The students are diverse in age and appearance, all looking towards the speaker. The lighting is warm and focused on the speaker, creating a professional and academic atmosphere.

1993, IBM PC:s and an Adidas network



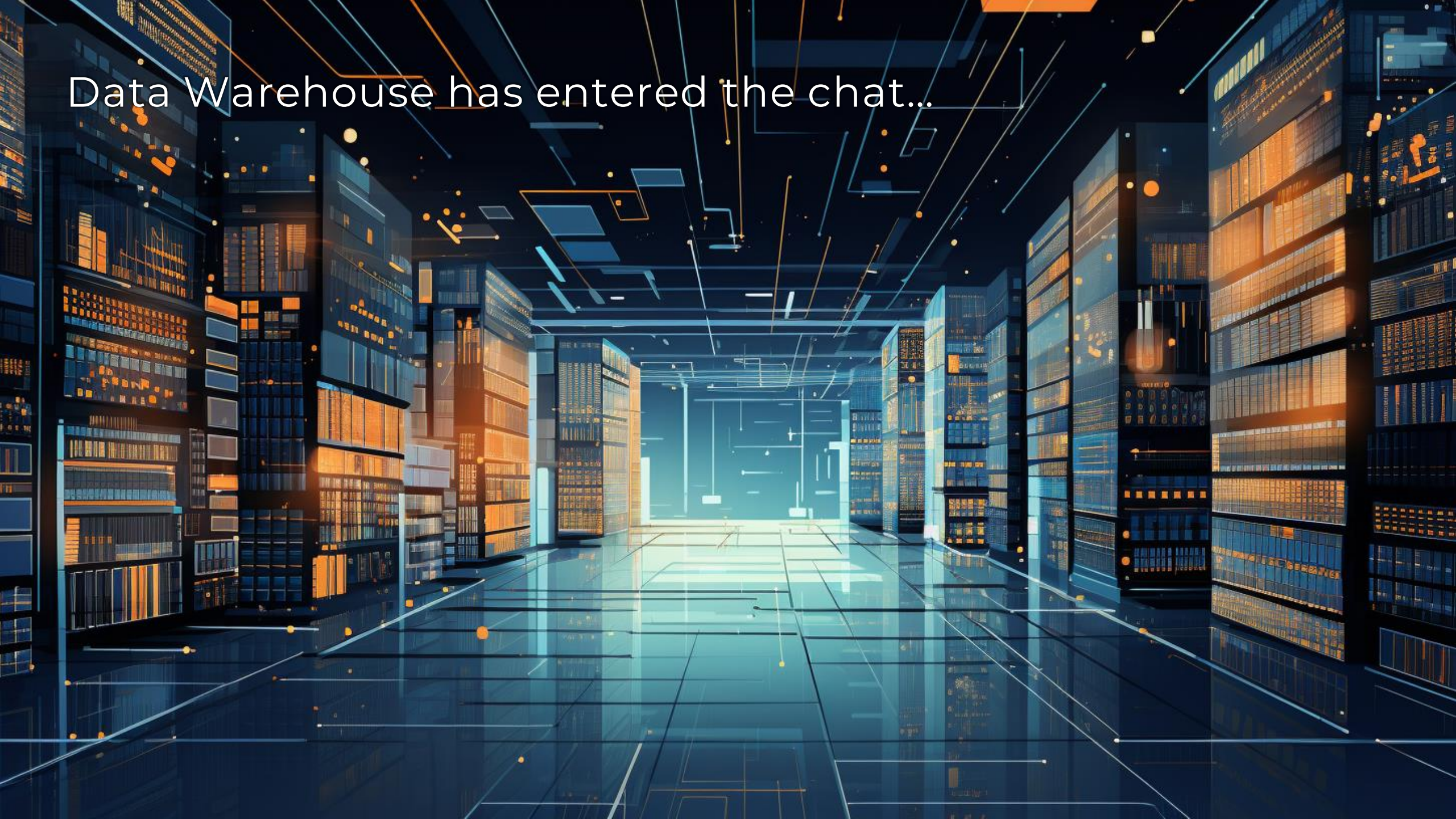
Networked computers had existed since the 70:s



Integration tools made it a lot easier to make a mess



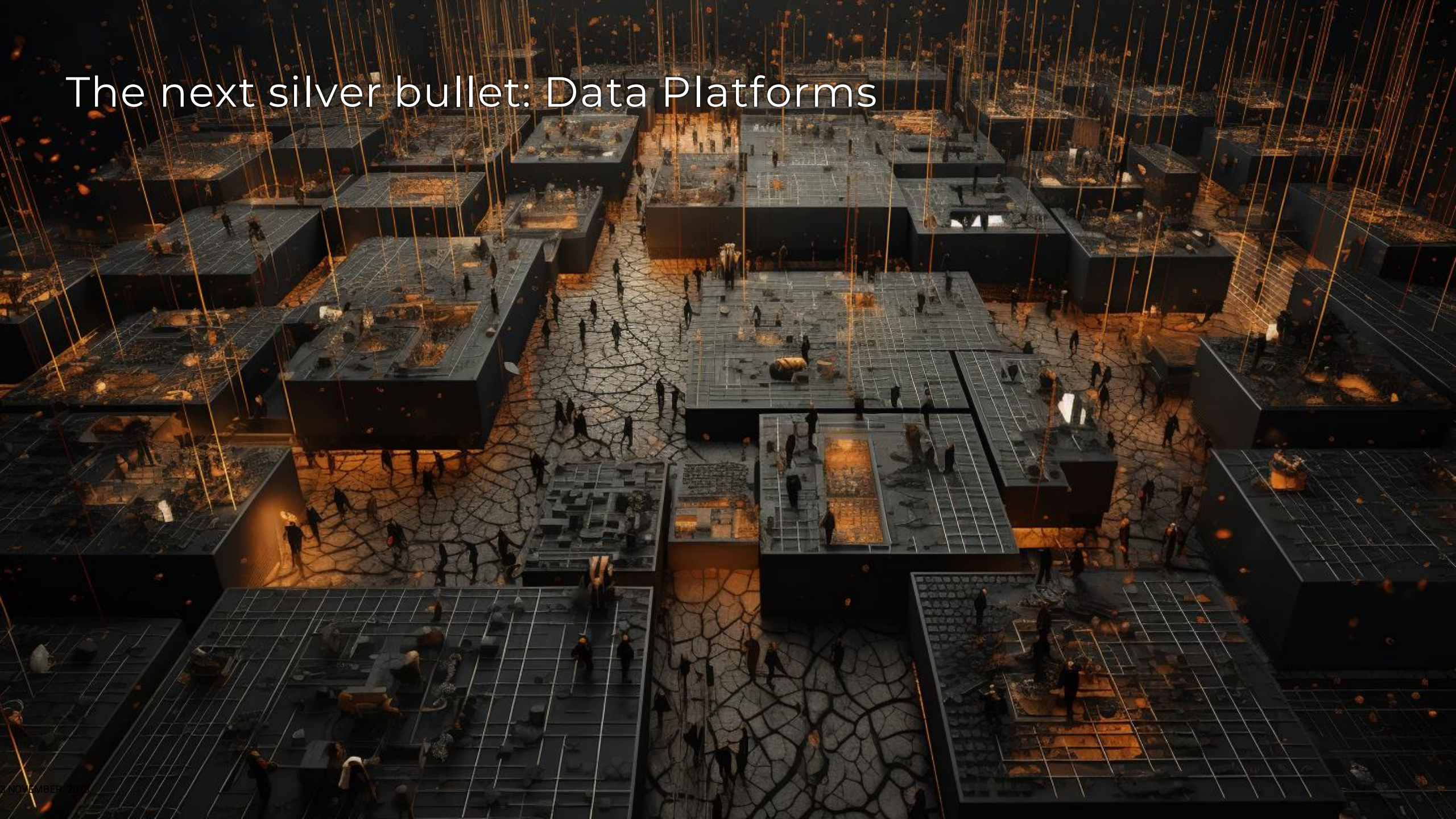
Data Warehouse has entered the chat...



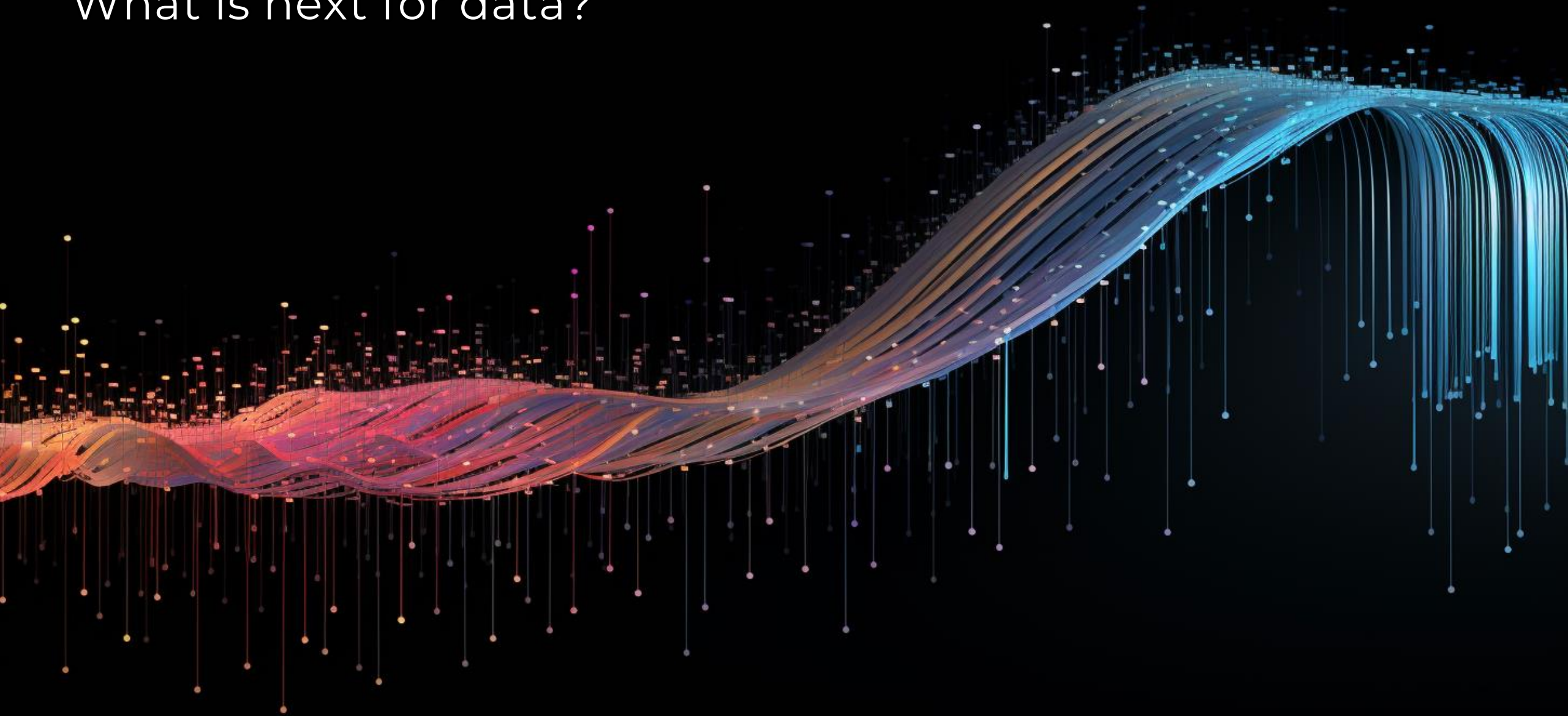
Then came integration tools with ready made adapters



The next silver bullet: Data Platforms



What is next for data?



Business happens in real-time

The background of the image is a dynamic, futuristic digital tunnel. It features a central perspective where numerous light trails, primarily in shades of blue and orange, converge towards a bright, glowing white and yellow focal point in the distance. The trails vary in length and intensity, creating a sense of rapid motion and depth. The overall color palette is dominated by these vibrant blues and oranges against a dark, almost black background, which is peppered with small, distant light particles.

The promise of real-time data platforms

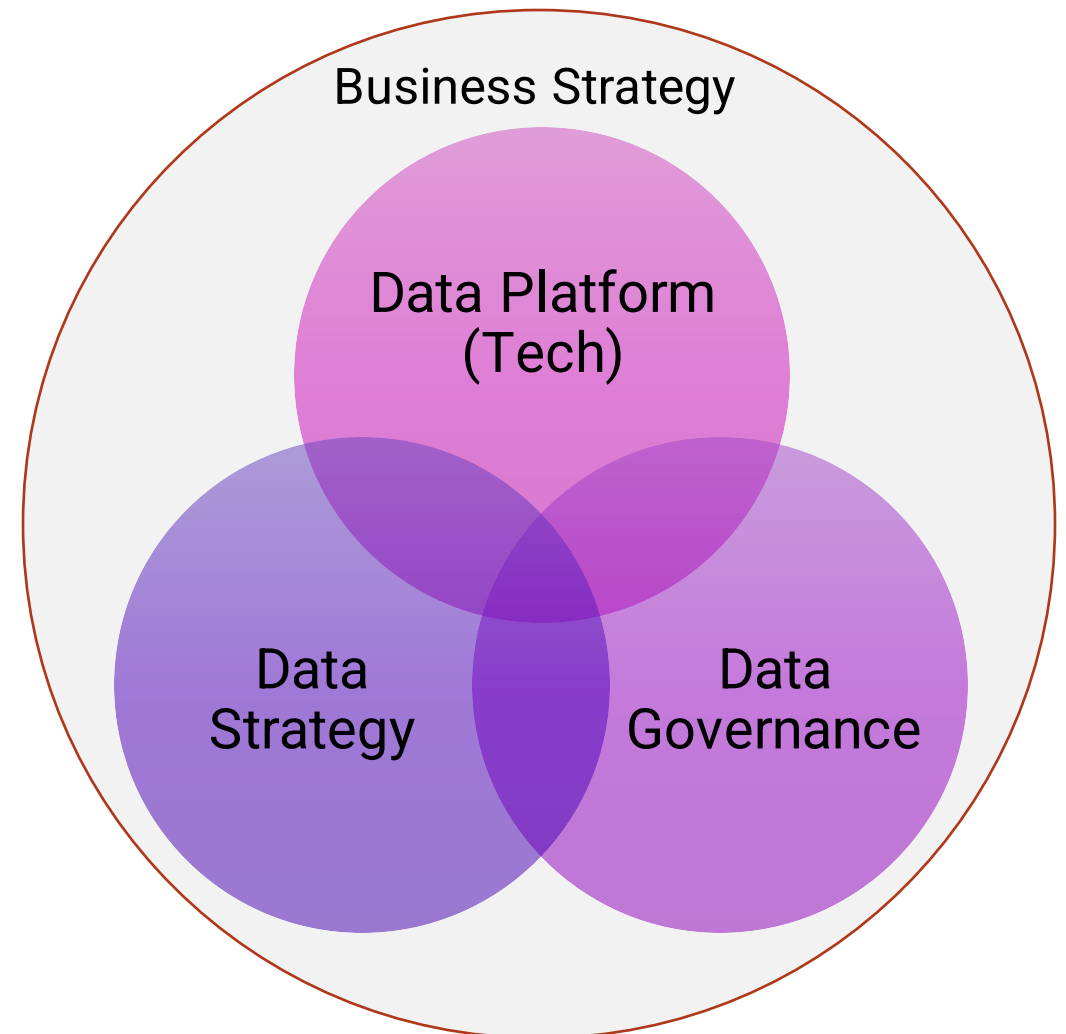
Democratize access to consume and produce both transactional and analytical real-time data, in the language of the business, for the following purposes:

- ML, BI & Analytics
- App development
- API:s for interacting with data and logic
- Generative AI, the UI of the future
- Effective use of low-code and no-code tools
- Integrations

Actionable data **does not** equal only analytics and must include the capability to both read and change data in real-time.

A Data Platform is more than just technology

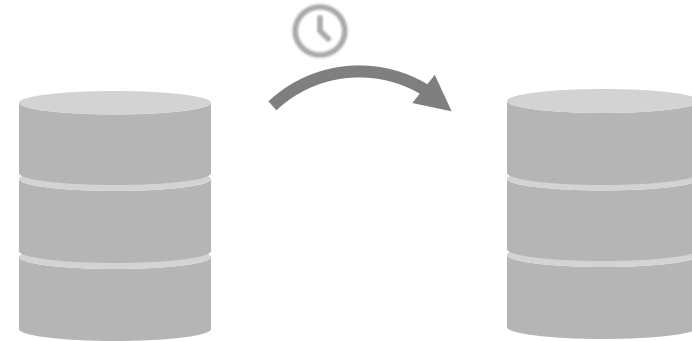
- The Data platform is an investment supporting the business strategy
 - The need and drive for a Data Platform should come from a chosen business strategy
- A successful Data Platform implementation:
 - All of the company's data usage goes through the Data Platform! Both reading, updating and creating data
 - A Data Platform involves all users and producers of data: Analytics, Reporting, ERPs, App, Integrations...
- A well-formed Data Strategy positions the Data Platform correctly in the organization.
 - A data strategy helps to make commitments toward the goals of the Data Platform
 - All organization parts have a common goal in making data into a usable product
- A continuous Data Governance process ensures that the Data Platform has high quality data that is well documented and understood by the organization
 - High quality data needs clearly stated owners
 - All stakeholders need a common business and data terminology



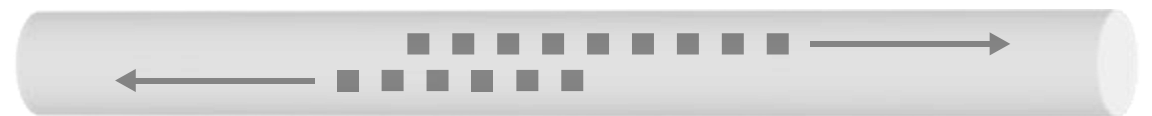
Streaming Data

- Streaming data is the continuous flow of data generated by various sources. By using stream processing technology, data streams can be processed, stored, analyzed, and acted upon as it's generated in real-time.
- The term "streaming" is used to describe continuous, never-ending data streams with no beginning or end, that provide a constant feed of data that can be utilized/acted upon without needing to be downloaded first.
- Similarly, data streams are generated by all types of sources, in various formats and volumes. From applications, networking devices, and server log files, to website activity, banking transactions, and location data, they can all be aggregated to seamlessly gather real-time information and analytics from a single source of truth.

ETL / ELT in batches:



Data streams:

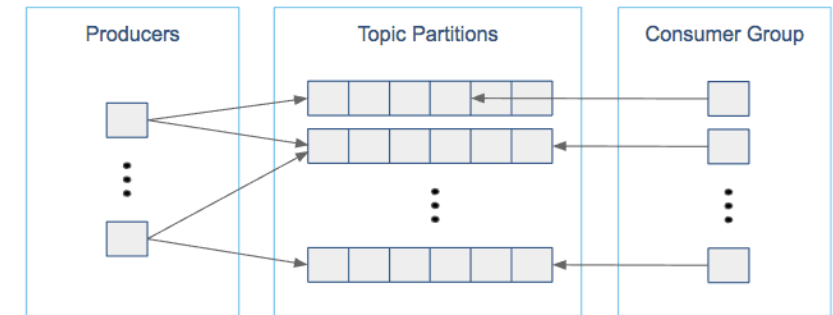


Events as a foundation for software architecture

"Event-driven architecture (EDA) is a design paradigm in which a software component executes in response to receiving one or more event notifications."

- Gartner

- A business event can be defined as a significant occurrence or change in data, expressed in a way that holds meaning for the business.
 - Examples can include a customer order being approved an invoice getting paid, or a customer exceeding their credit limit.
 - Events are a much better integration trigger than scheduled or data change-based integrations
- An event-driven architecture (EDA) is a way of building systems that rely on business events to trigger actions.
- Solutions built this way, rather than the classic "snapshot-of-data"-style, give greater flexibility for adding new features and behaviors.
- This makes EDA very well suited for companies that want to continuously improve their solutions and respond rapidly to new requirements and changes in the business environment.



Data as a Product

Data as a Product refers to the approach of treating data as a valuable, user-centric asset that is owned, maintained, and continuously improved by dedicated teams, ultimately fostering efficient and data-driven decision-making within organizations.

What are the benefits of this?

Ownership & accountability - Encourages responsibility for data quality, security, and usability

User-centric design - Focuses on end-users' needs, driving accessibility and data-driven decision making

Standardization & interoperability - Common standards enable seamless integration and collaboration

Decentralization & scalability - Empowers teams, distributing workload and avoiding bottlenecks

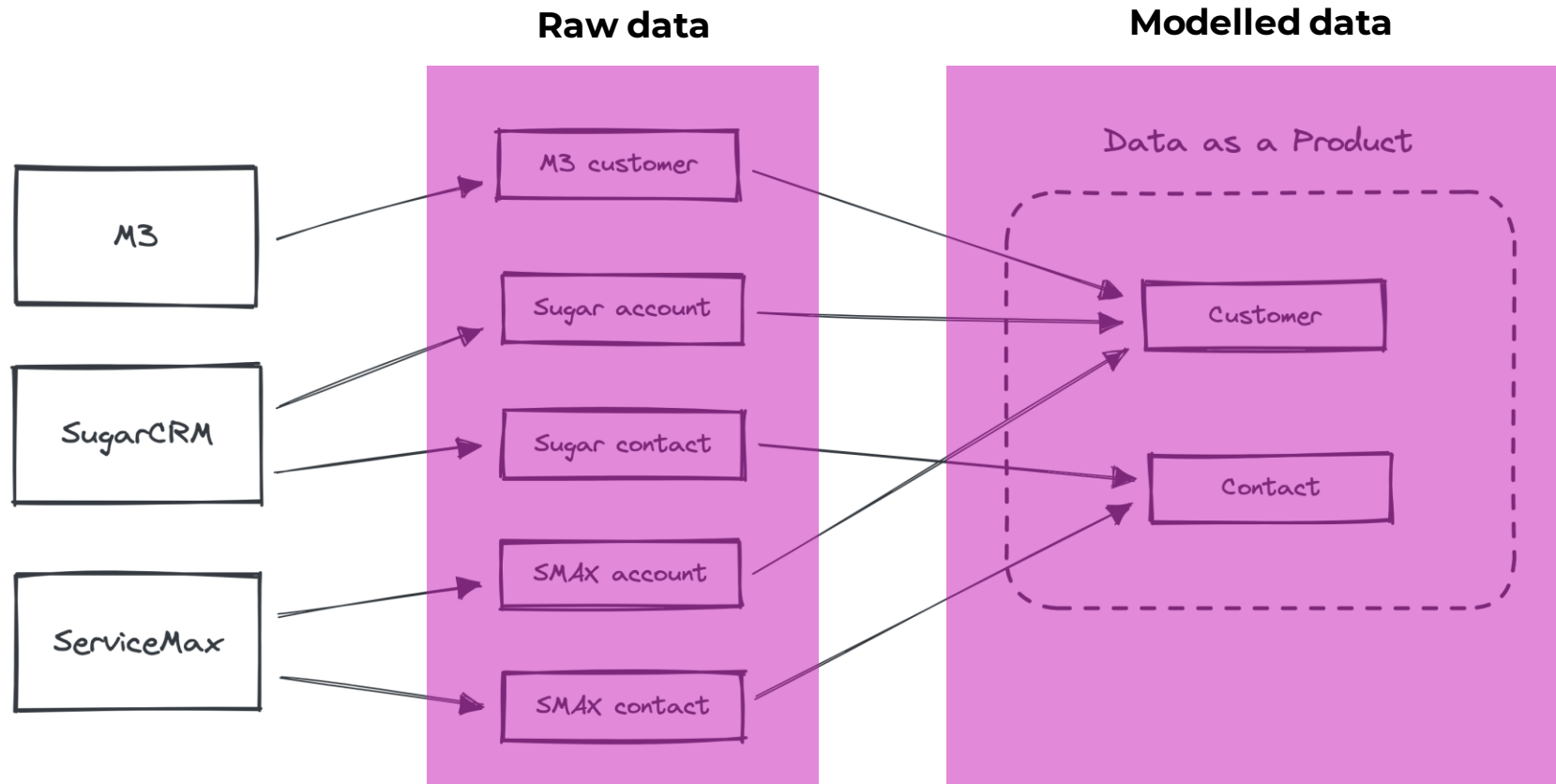
Continuous improvement - Lifecycle approach ensures regular updates based on user feedback

Discoverability - Well-documented, cataloged data products reduce duplication and save time

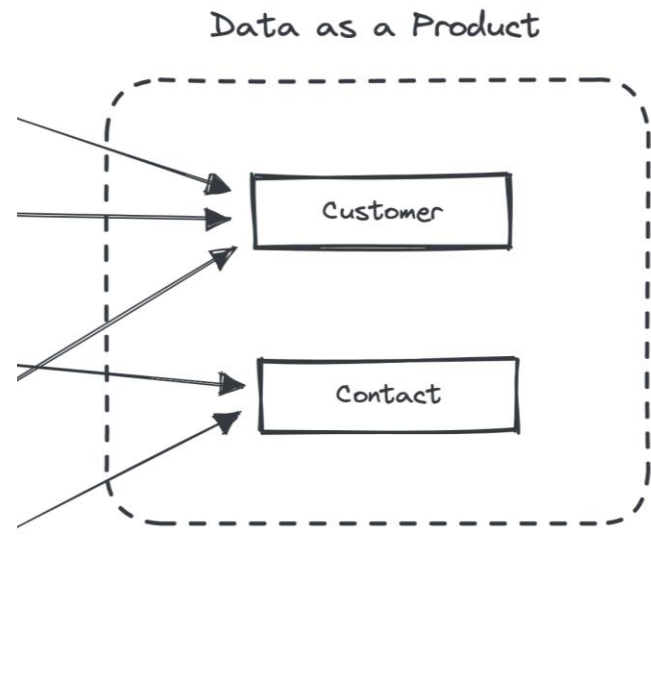
Reusability - Promotes building on existing data products, reducing redundant efforts and saving resources

Modelling data into Products

Data modeling end-users' needs over source system structure, often involving data transformation, aggregation, or enrichment to create a user-friendly representation that promotes reusability across the organization.



Self-service access to data products

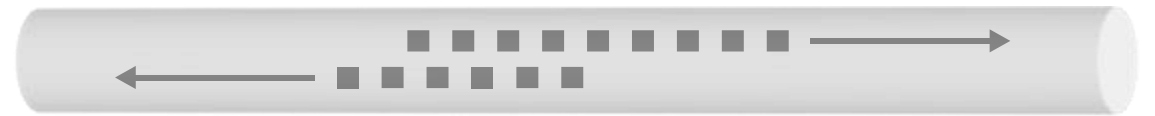


Data Products can be exposed in different ways, but they must be published in a catalog.

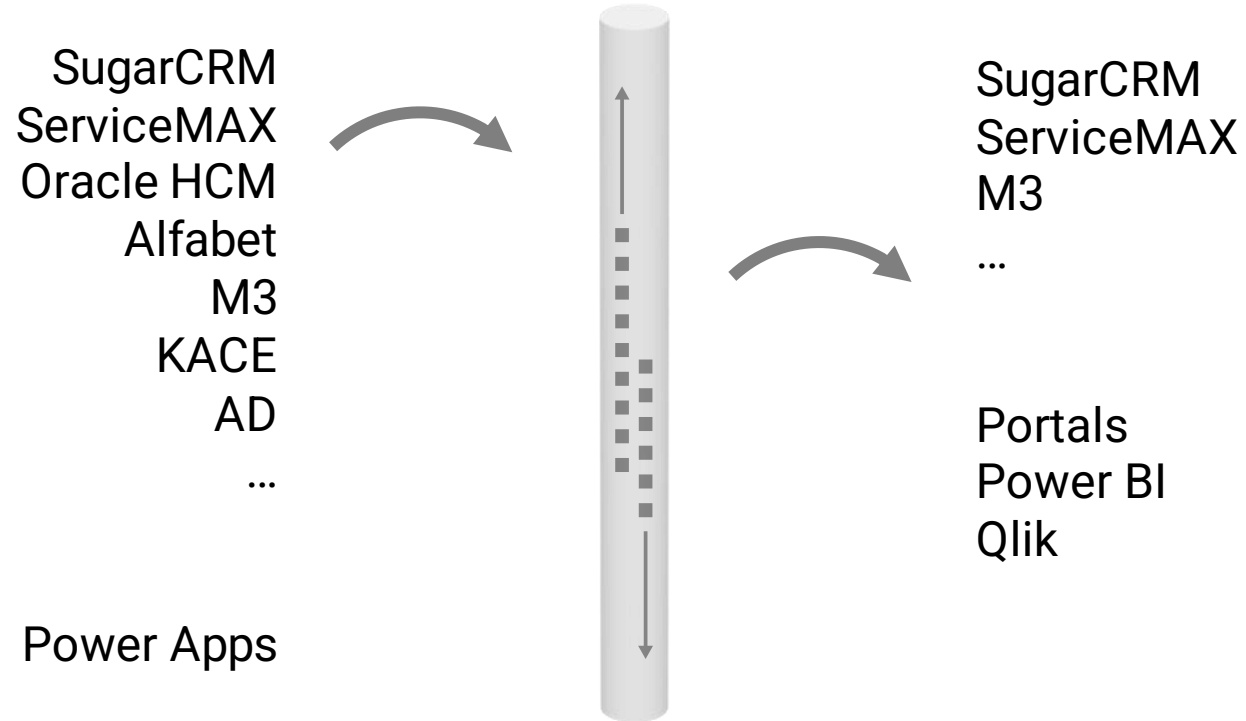
Formats may include:

- Streaming data
- API:s, for example as GraphQL or REST
- Ready-made data models in PowerBI or Qlik

Design the platform around capabilities



Design the platform around capabilities



**What were the tangible
improvements?**

Improved integration capabilities

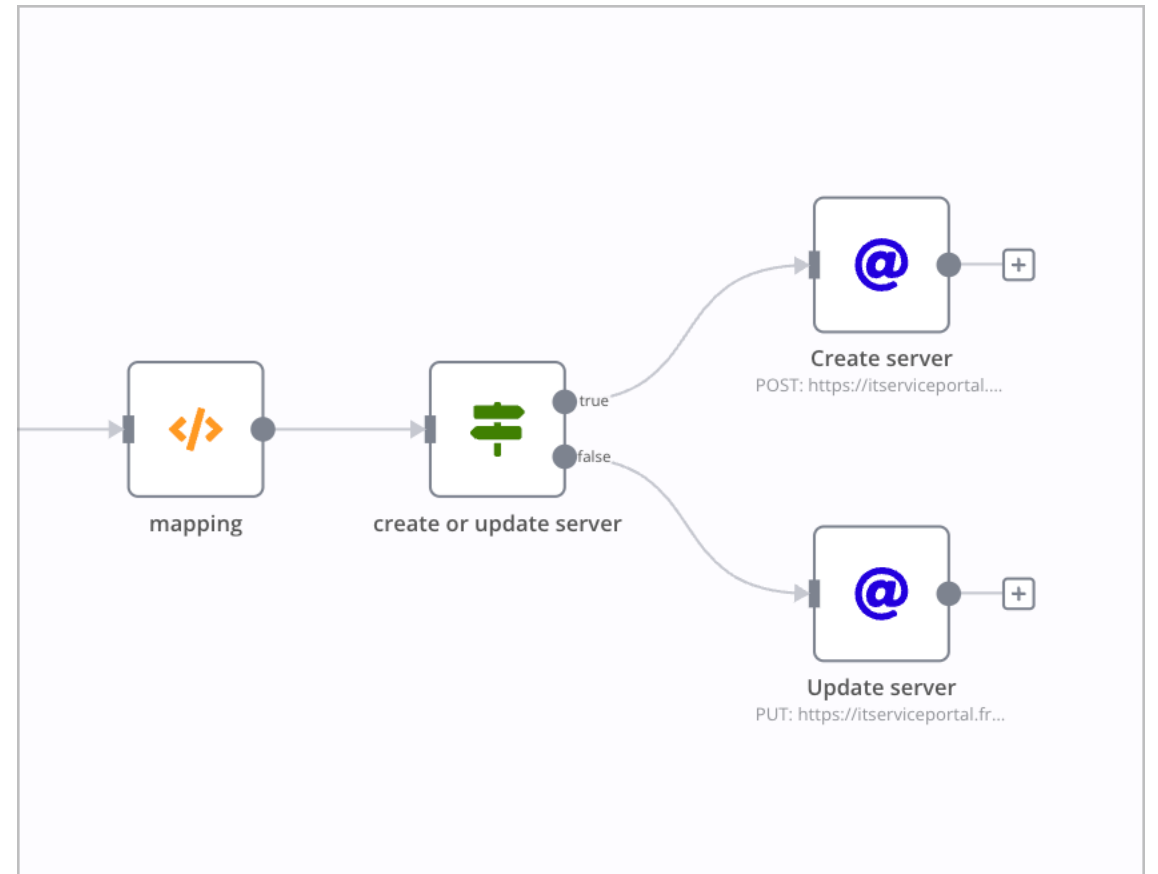
How did we improve integrations?

Incoming data

- No more point-to-point.
- Integrations focus only on the technical part of connecting a system to the platform.
- Incoming data can now be reused, because it no longer is connected to who or what is going to use it.

Outgoing data

- No more point-to-point.
- Since there is a common format in the platform, any data mapping etc. is focused on the needs of the receiving system.
- No need for the integration to understand where the data comes from, or if it a combination of different sources.



And if there is more complexity?

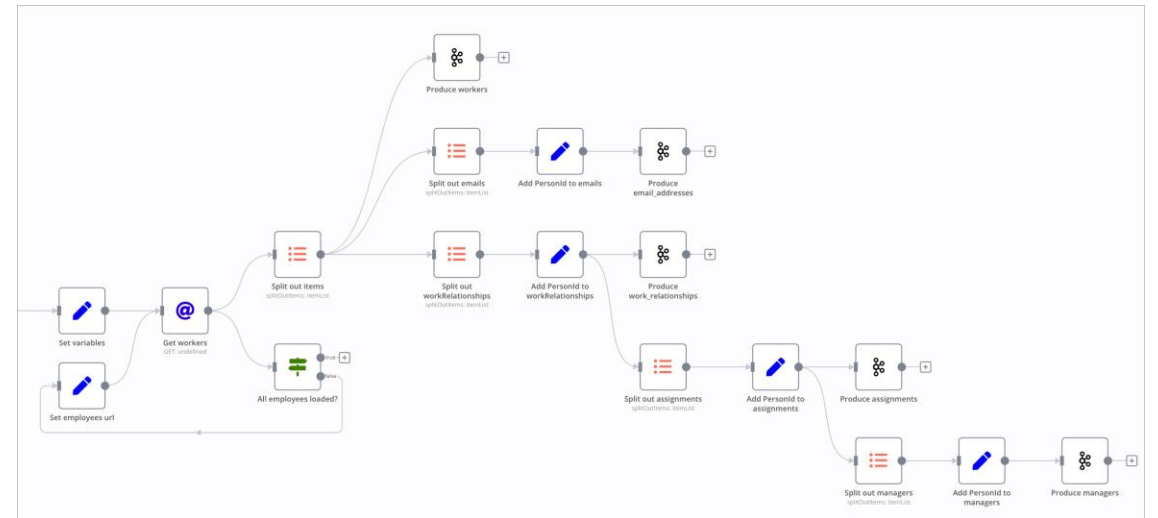
Sure, any inherent complexity in either the source or destination data needs to be managed.

Incoming data

- Removing point-to-point –based designs lets the incoming data part focus on whatever the source complexity is. Case on the right, deep data structures where many data entities are embedded within each other.
- Incoming data is broken out into separate units, and each unit becomes a source of its own, bringing us back to reusable entities.

Outgoing data

- The data products can be freely combined to create whatever structures the destination system needs.
- No changes are needed to the source systems or the data products.



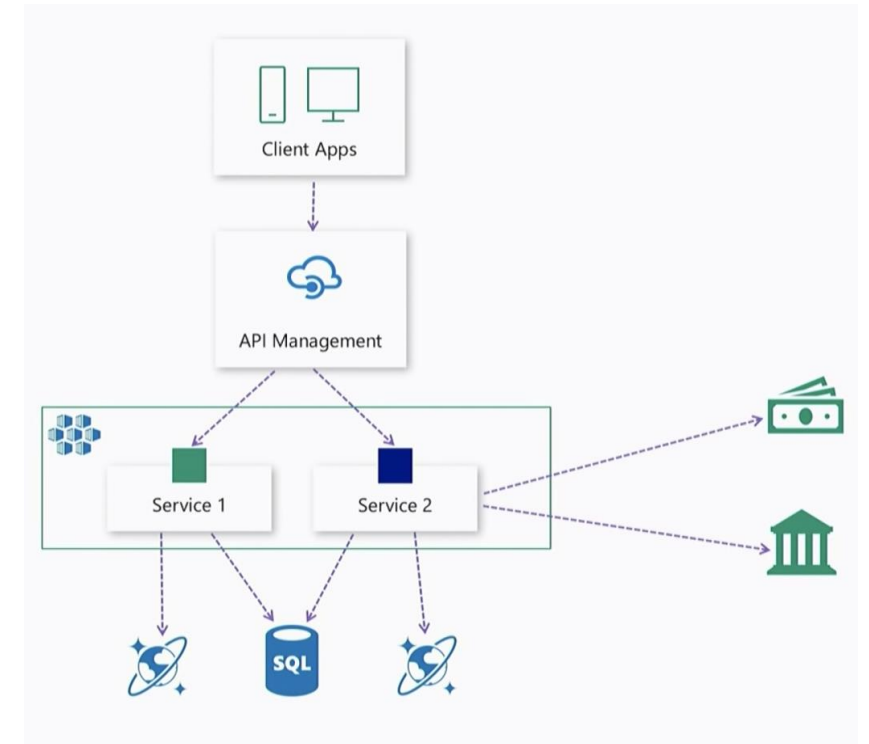
Internal and External APIs

API:s for reading and changing data

- Data in a data platform is be accessed through API:s. These API:s can support different technologies, for example:
 - “Traditional” database connections (they are a form of API as well)
 - Web Services and REST-style API:s
 - GraphQL for querying across several API:s

The reason why they need to exist in different technical formats is that they can be consumed for different purposes, and by tools with different technical capabilities.

- For such data that can be changed, separate API:s are typically exposed for that.
 - API:s that change data don’t do so by changing the data directly. They perform the changes through whatever source system produced the data to begin with.
 - This means that change is always asynchronous
- Regardless of how an API is accessed, and which technology is used, it needs to be protected and governed. This is both a process and a technology problem, and for the technology part an API Gateway is typically used for API Management.



Support for low-code tools

The app gap challenge

500 million

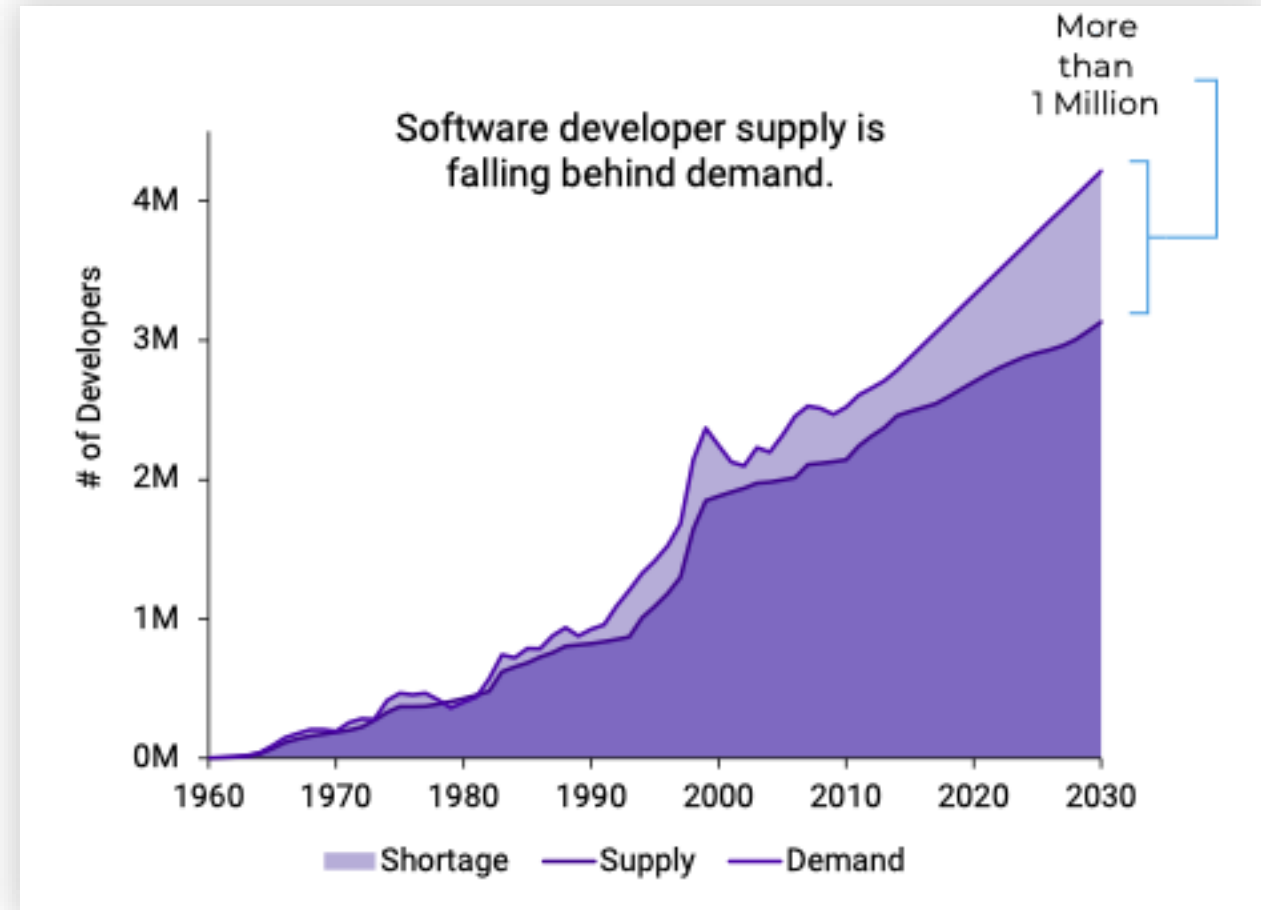
new apps will be built in the next 5 years – more than all apps built in the last 40 years! ¹

5x

faster demand for mobile apps than IT departments can deliver. ²

86%

of organizations struggle to find technical talent to build applications. ³



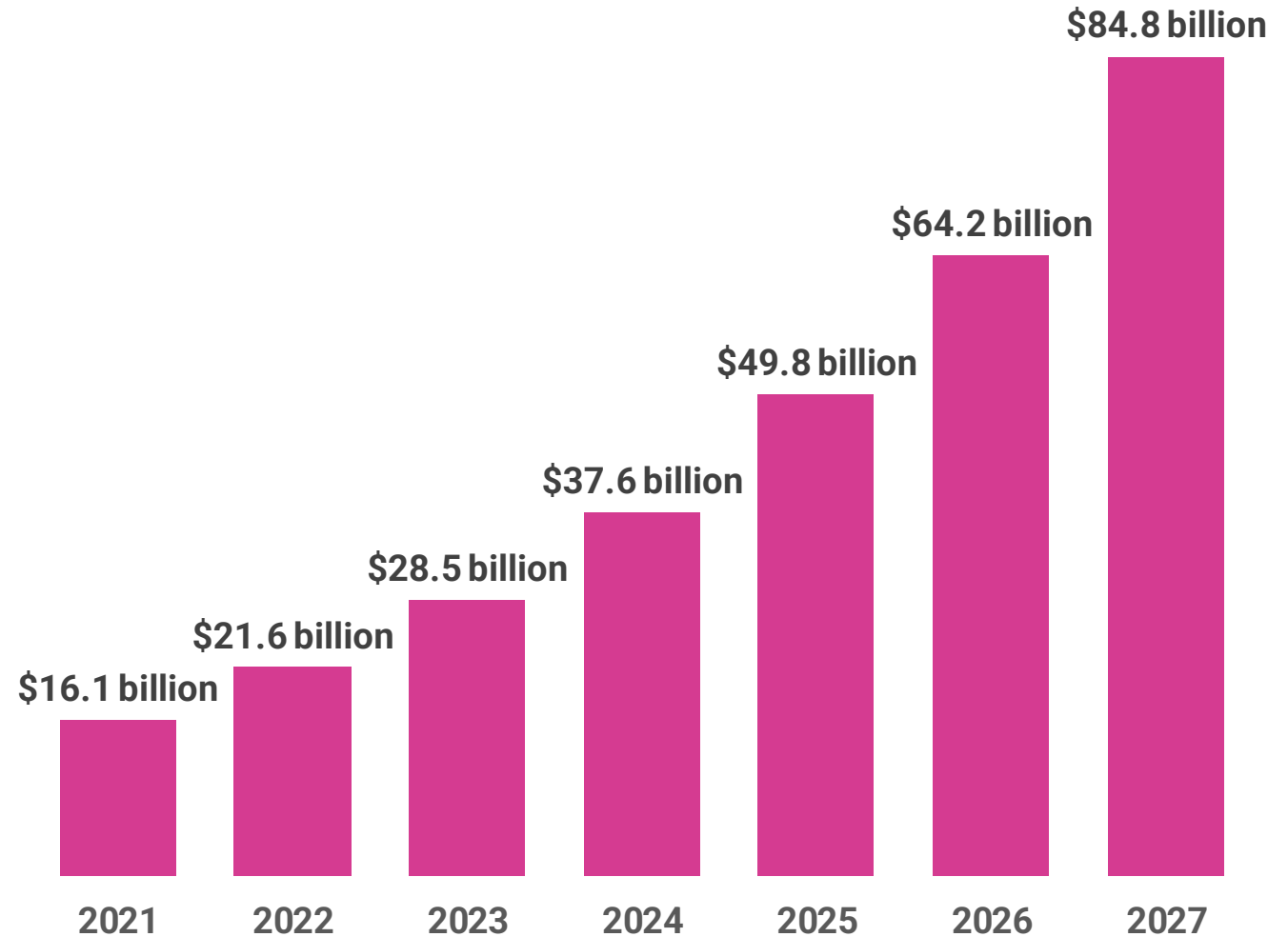
¹ IDC FutureScape: Worldwide IT Industry 2020 Predictions. Doc # US 45599219, October 2019

² Gartner, How to Deliver Enterprise Mobile Apps Faster – 2017

³ Patrick Moorhead, Microsoft goes all-in on hybrid Cloud and Edge at Ignite 2019, citing Indeed survey, Forbes.com, Nov 2019

A good API layer is crucial for low-code tools

- Because of the nature of the events, it is possible to connect new event consumers without having to add a lot of complexity to the architecture, or without having to rely on outside contractors to build new functionality.
- This is one of the largest benefits of an EDA; the ability to add new capabilities without having to make changes to the existing solution.
- There are hundreds, if not thousands, of low-code tools available today. More are appearing every month, and it will take a good while for the field to settle. We recommend not overdoing the tool selection process, you should be focusing on short-term wins.
- If a solution is quick to build with a low-code tool it doesn't really matter if you have to rebuild it a couple of years later – you will still have benefited greatly from it.

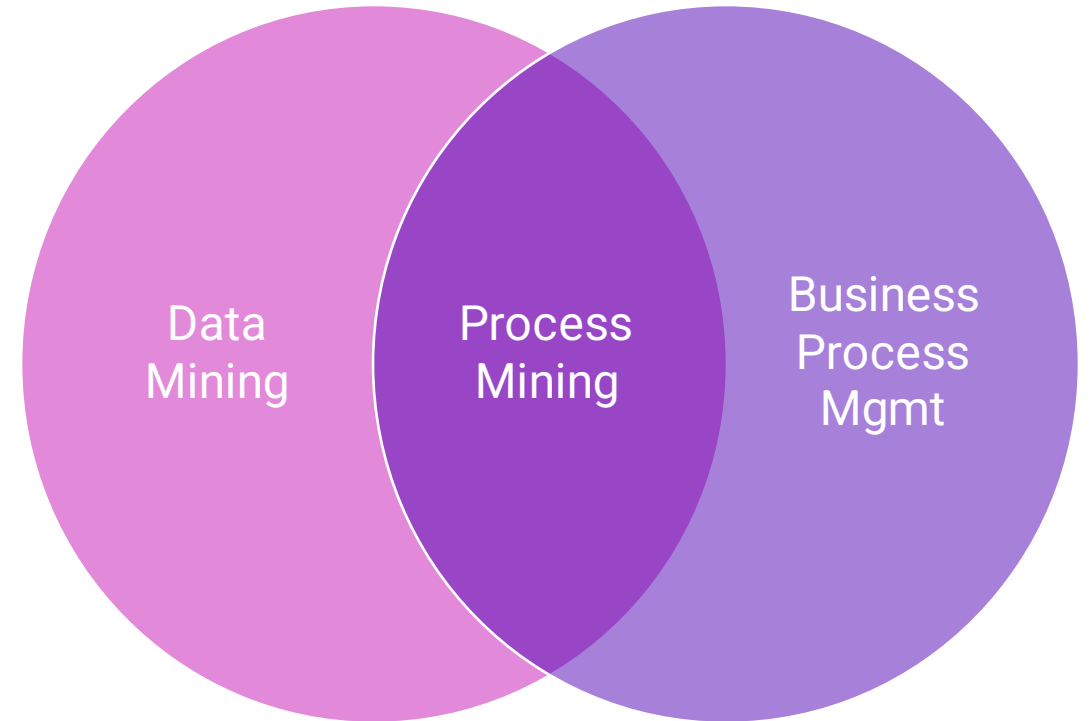


Source: Gartner 2021, Markets and Markets 2020, Bradessence Market Research 2021
Growth at 31,9% CAGR

Process Mining

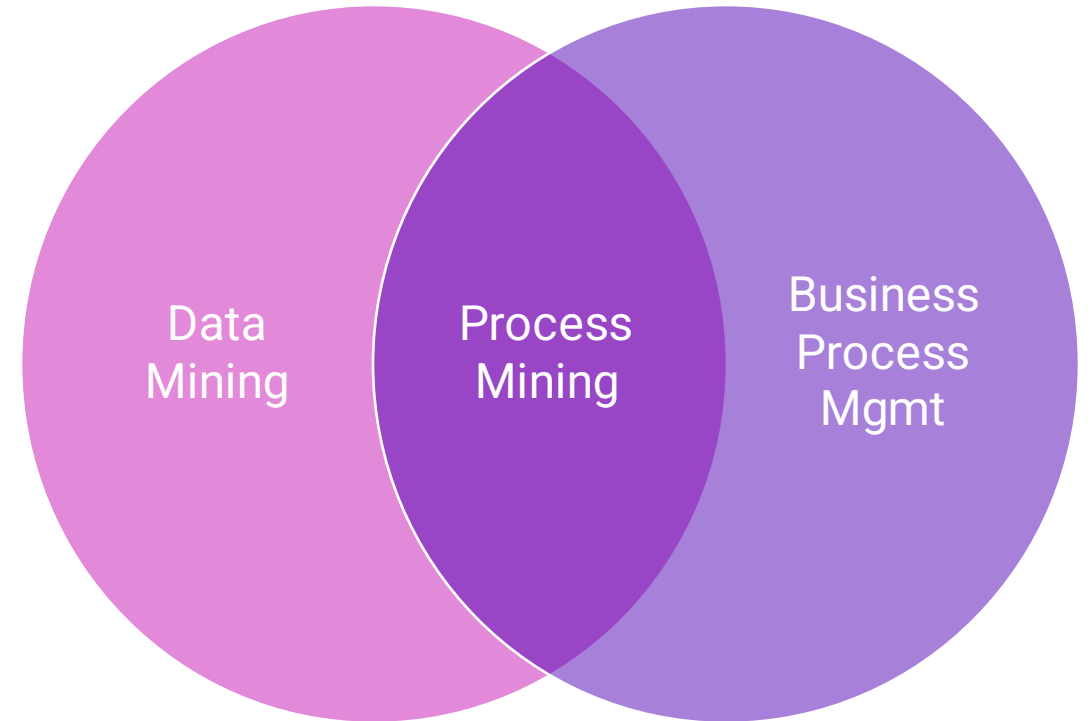
Why talk about Process Mining?

- From a Data Platform architecture point of view: Prioritizing core systems from a **process digitalization point of view**.
- From a tech point of view: The data usage methods are highly reminiscent of what you do in BI/Analytics cases or in Lean implementation initiatives.
- Process Mining taps into a wide array of your systems. The data mining part should be considered as a possible benefit of the common data platform implementation.



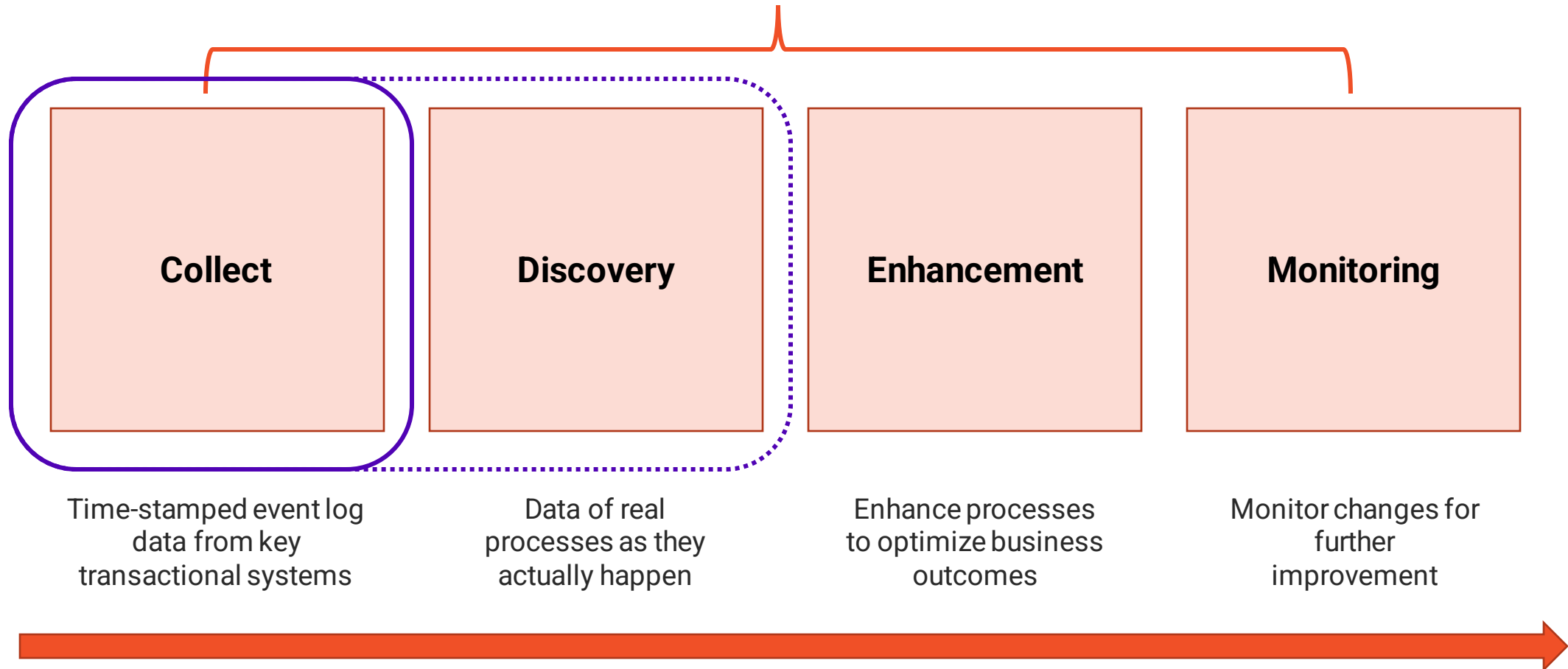
Process Mining

- Your processes might not work like you think they do. For example:
 - There is an underlying pattern or process for your order handling that you did not know exists
 - A buyer does not follow your formal and predefined procurement process (Maverick buying)
 - Your predefined process is not performing as well as expected due to bottlenecks in your order delivery process
- From a Data Platform architecture point of view: Prioritizing core systems from a process digitalization point of view.
- From a tech point of view: Analyze the data that is already flowing through your platform
- Process Mining taps into a wide array of your systems. The data mining part should be part of the common data effort!



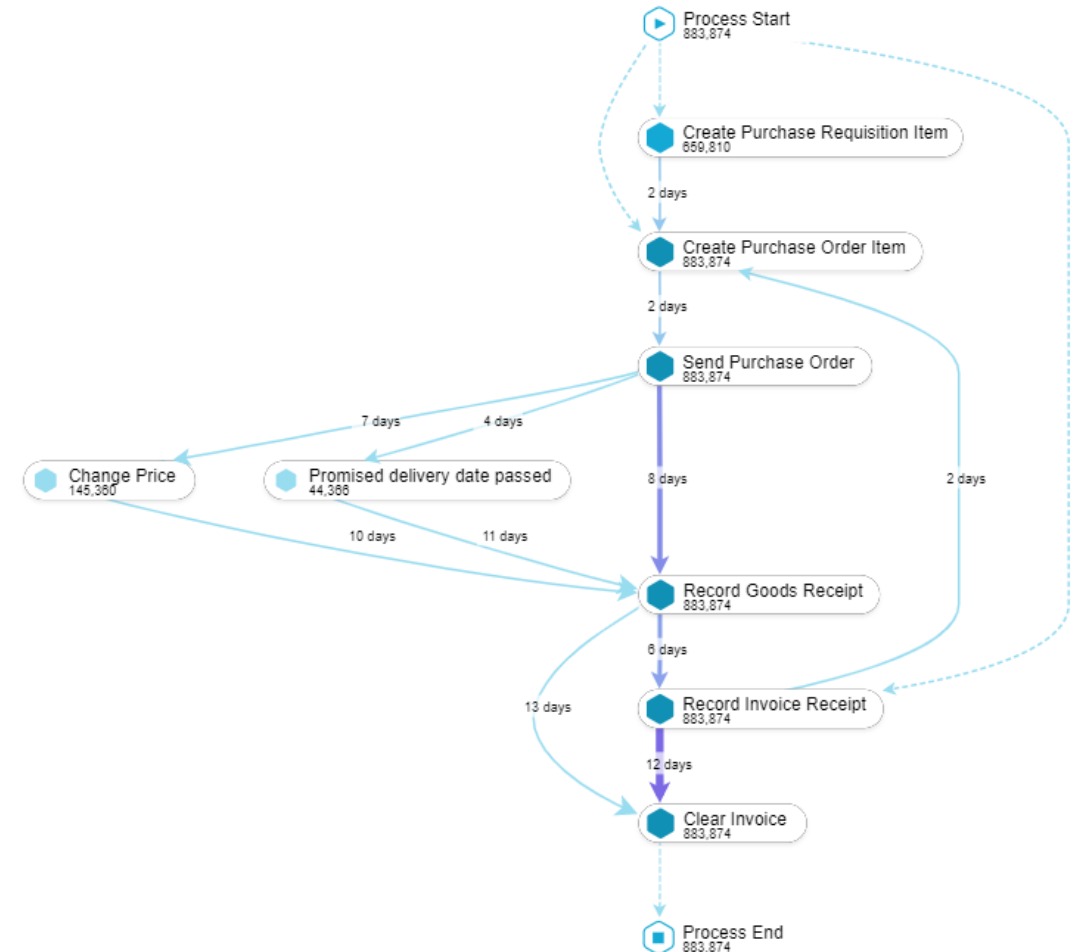
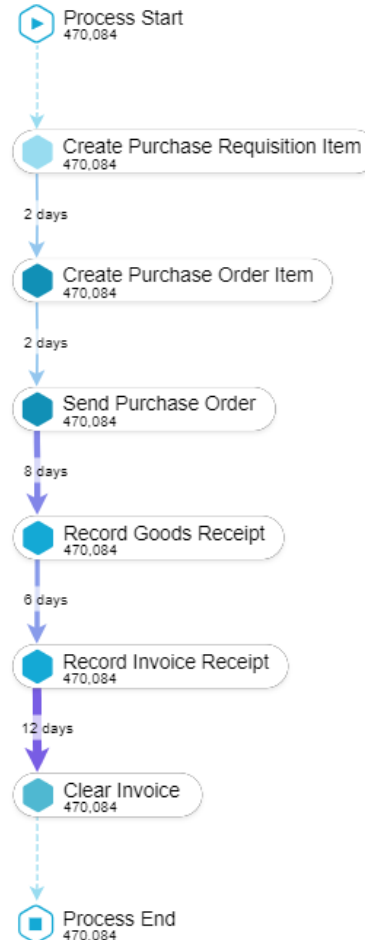
The 4 Key States of Process Mining

Process Mining



Key to Process Mining: Discovery

- Discovering your process based on the event log data
 - Are there any bottlenecks and why?
 - What are the most common paths in your process?
- Processes often have variants that are deviations from your optimal or most effective path
 - Analyzing process variants can reveal underlying causes of process friction and points for improvement



Generative AI and the need for data

The only true constant in life is change...

AI and Machine Learning


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Most common AI use cases for business

Common projects for your own AI:

- Demand forecasting
- Churn and CLV prediction
- Lead/opportunity scoring and propensity scoring
- Product recommendations
- Dynamic pricing
- Risk prediction, for example project risks
- Predictive maintenance
- Route optimization
- Decision automation/augmentation

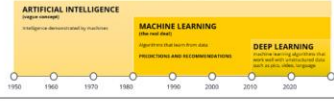


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Possibility: Utilize AI and Machine Learning

- Artificial Intelligence (AI) and Machine Learning (ML) are increasingly hot topics, and there is a definite potential in applying these concepts to business.
- Machine Learning and Artificial Intelligence are terms that are being thrown around rather wildly, and in many instances completely incorrectly. To understand the realities and possibilities behind the terms we need to start with the definitions of them. This is unfortunately further complicated by the fact that there are competing definitions for Artificial Intelligence.
- Artificial Intelligence is human-like (or higher) computer intelligence that doesn't exist, and most likely won't for the next 30 years, if ever.
- Artificial Intelligence is intelligence demonstrated by machines. This definition has been around since the 1950s and is the one we will use here.
- Fortunately, we're not dependent on the definition of Artificial Intelligence to be able to understand the potential that Machine Learning represents. The hierarchy of these terms look like this:



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Bygghemma Finland

Case Overview:

Bygghemma owns a multitude of different websites which all gather an immense amount of data.

Data is seen as a competitive advantage for the company, and Bygghemma wanted to start taking advantage of their data in order to gain better insight about their business. Fulwind was chosen as a partner because of our experience data and analytics as well as Machine Learning.

Bygghemma visits over 150 000 names at their online stores with over 2 million website visitors each month. Artificial intelligence and Machine Learning would use Bygghemma's online targeting for marketing purposes and forecasting the demand of different retail brands.

Business need:

- Unify and integrate all data sources and business data in order to gain an overall view of the business.
- Increase transparency of the business data and utilize the information throughout the organization.
- Automate marketing activities and improve targeting.

Solution:


- With the help of an analytics solution, all data is gathered and combined together from all the different data sources.
- The Fulwind AI/ML solution is used to forecast the demand of retail items and in automating marketing activities and improving targeting.

Results:

- Online marketing data is combined with all the business data - the entire organization utilizes the same master data and information (sales, product teams, management and marketing).
- Business processes have become more efficient and the organization more collaborative.
- Profitability has increased as demand information has been utilized in sales and marketing. Analyzing customer behavior, advertisement and targeting, personalization of newsletters, decreasing the amount of manual work.

Bygghemma Finland in numbers:

- Over 420 M€ Sales revenue in 2019
- 1 000 Employees in Finland
- Over 2 million Website visitors each month
- Over 150 000 Unique website visitors



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Possibility: Utilize AI and Machine Learning

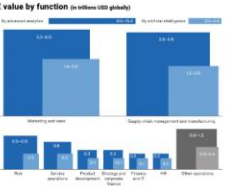
The business potential remains very high especially for larger companies with 100M-1B€+ revenue

Most common business objectives:

1. Improving your internal processes
2. Improving your internal decision-making
3. Improving your products and services

"much of the impact of machine learning will be of this type, quietly but meaningfully improving core operations"

- Jeff Bezos




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Notes about training data

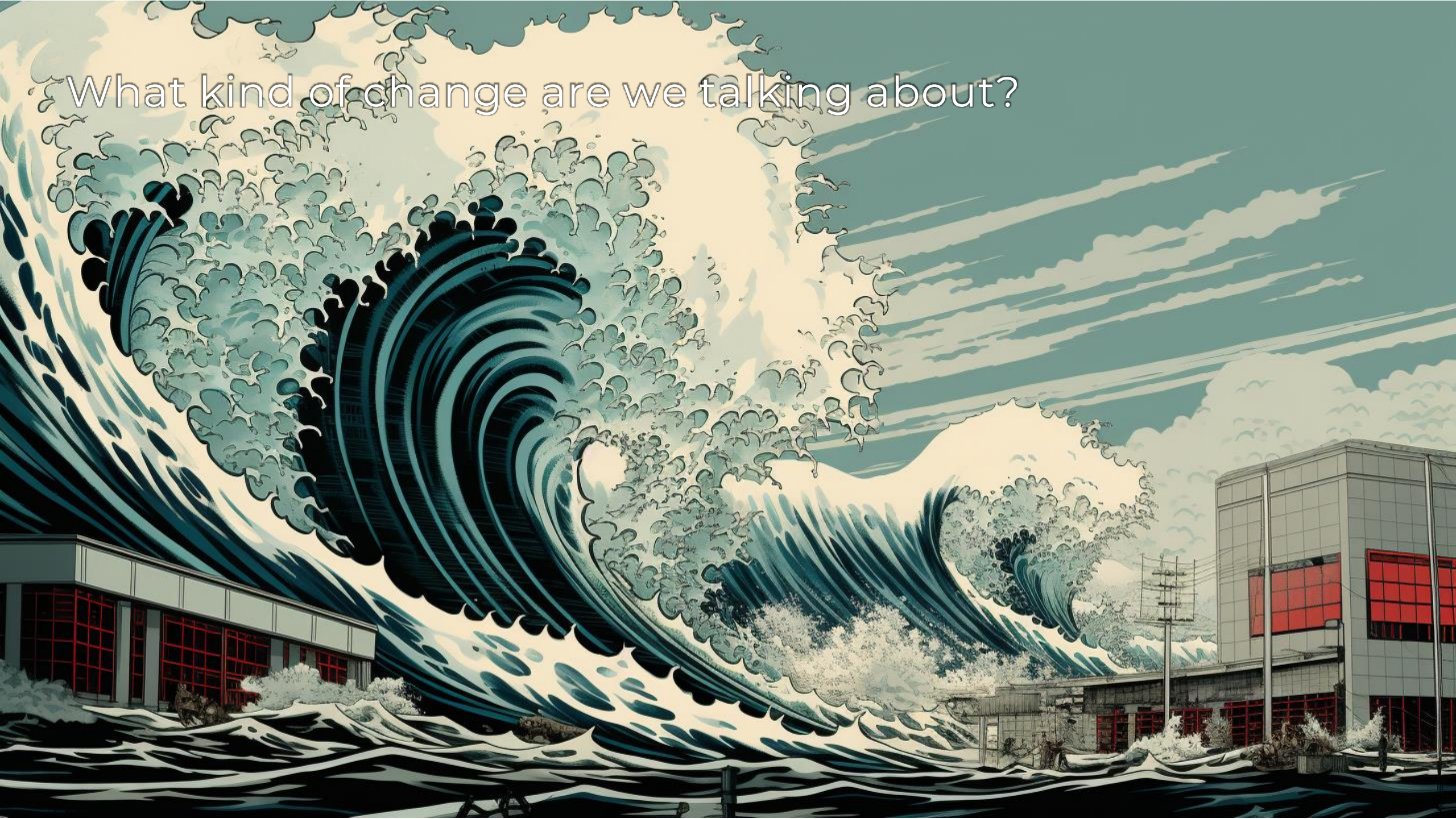
- AI learns to predict the future from historical data - Predictions are only as good as the data
- Common problems:
 - Historical data is not available or hard to gather and unify (emails, free-text fields)
 - Data from important features is not archived (only current product price known vs. storing price history)
 - Missing training labels (trying to predict probability that offer is accepted but large part of offers are left open in system)
 - Bad data quality (no unified way of booking leads to multiple ways to book things)
- What processes are most valuable? What information should be archived of them? How to ensure data quality of important processes?



Fellowwind

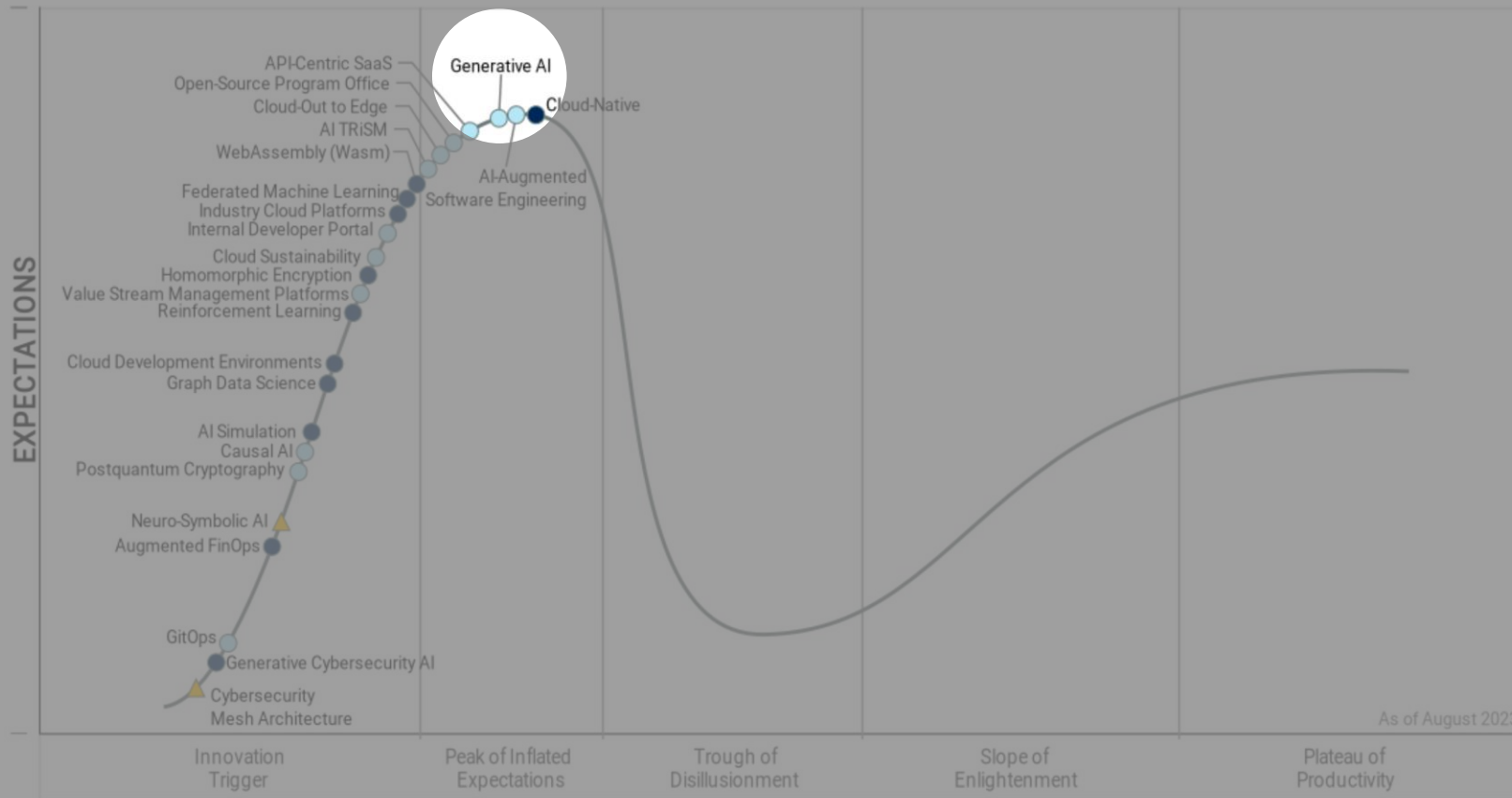
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What kind of change are we talking about?



With great hype comes great disappointment

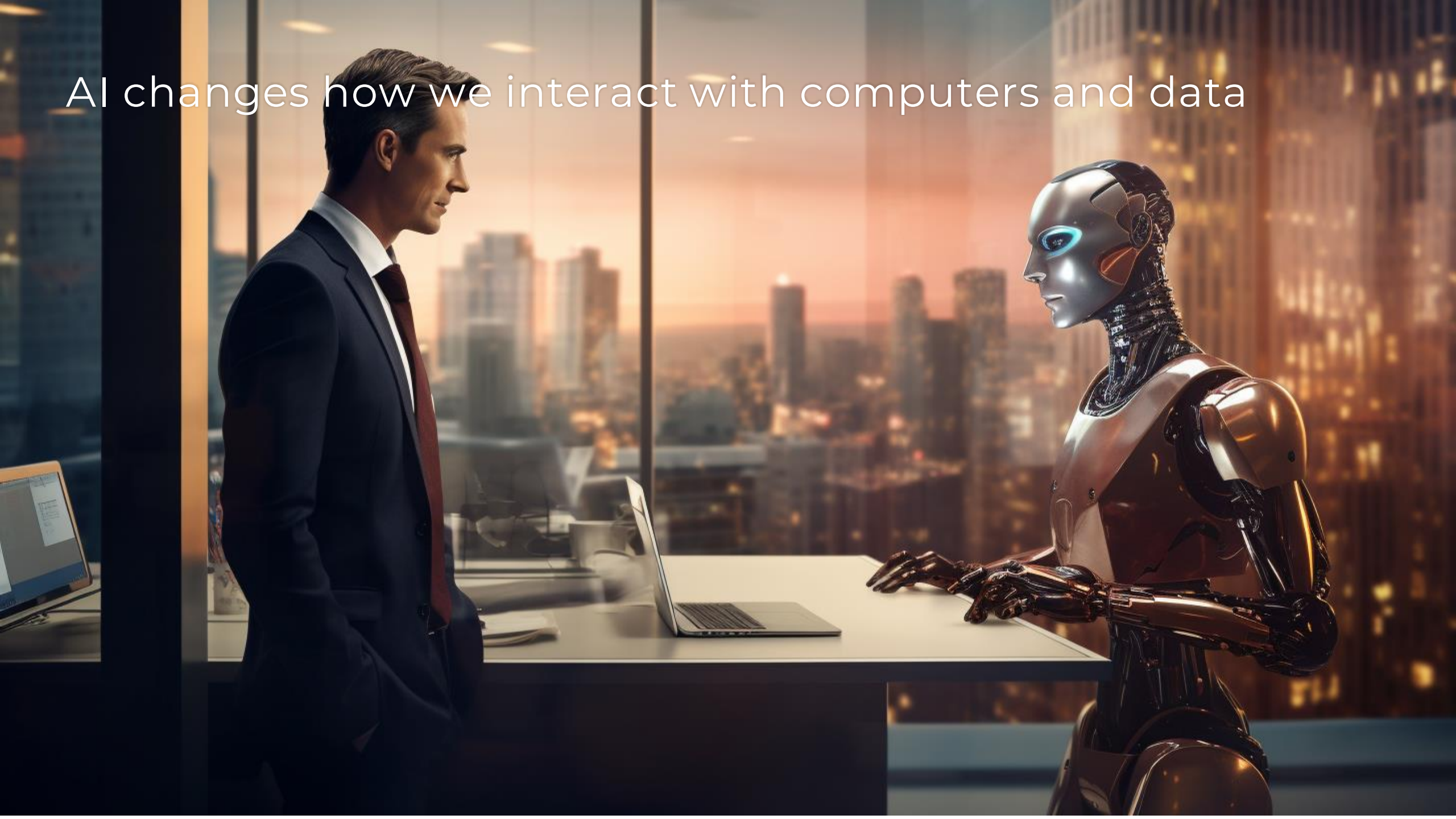
Hype Cycle for Emerging Technologies, 2023



As of August 2023

Plateau will be reached: ○ <2 yrs. ● 2-5 yrs. ● 5-10 yrs. ▲ >10 yrs. ⊗ Obsolete before plateau

AI changes how we interact with computers and data

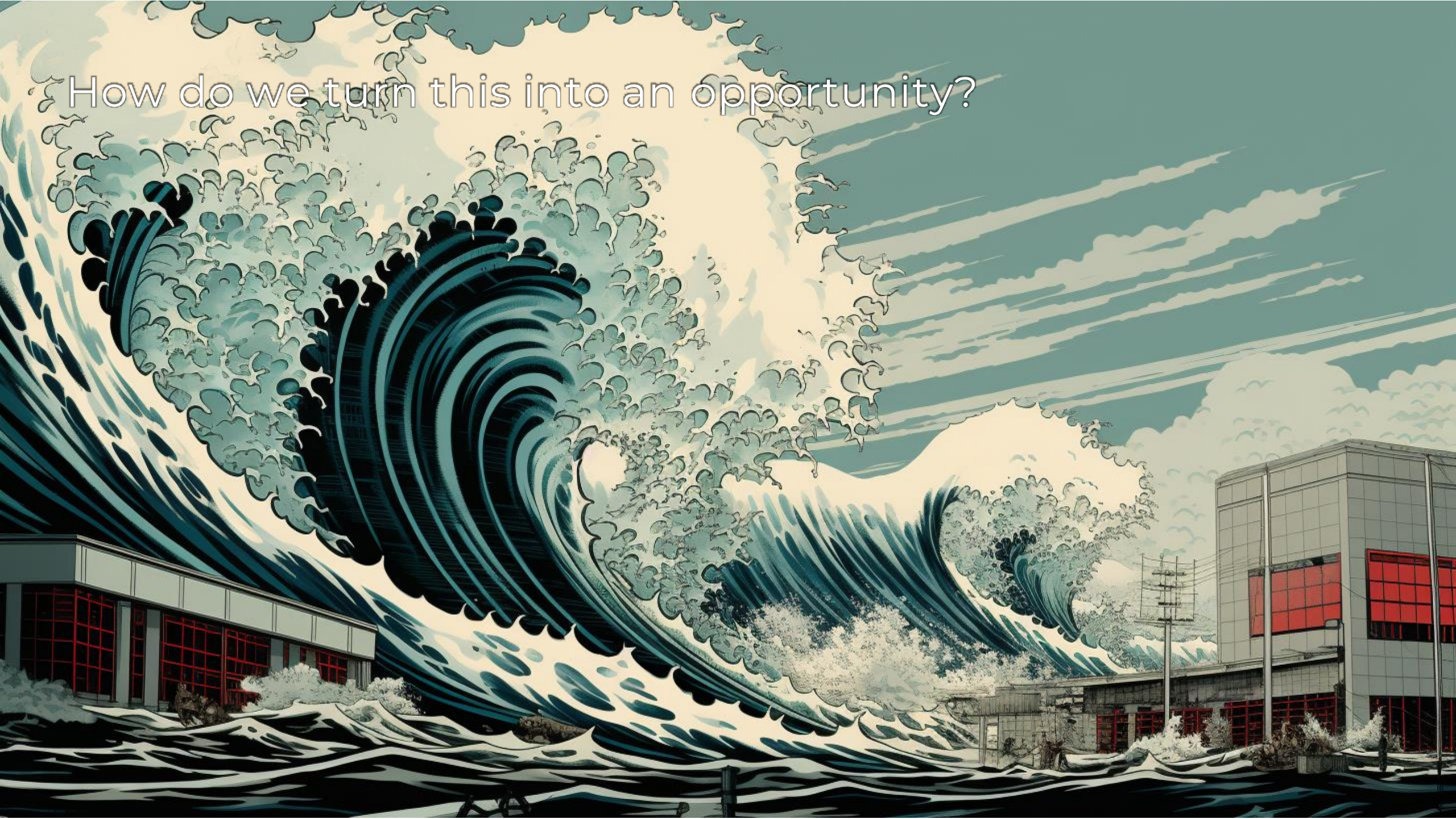




25 years ago, e-commerce blew up brick-and-mortar stores



How do we turn this into an opportunity?

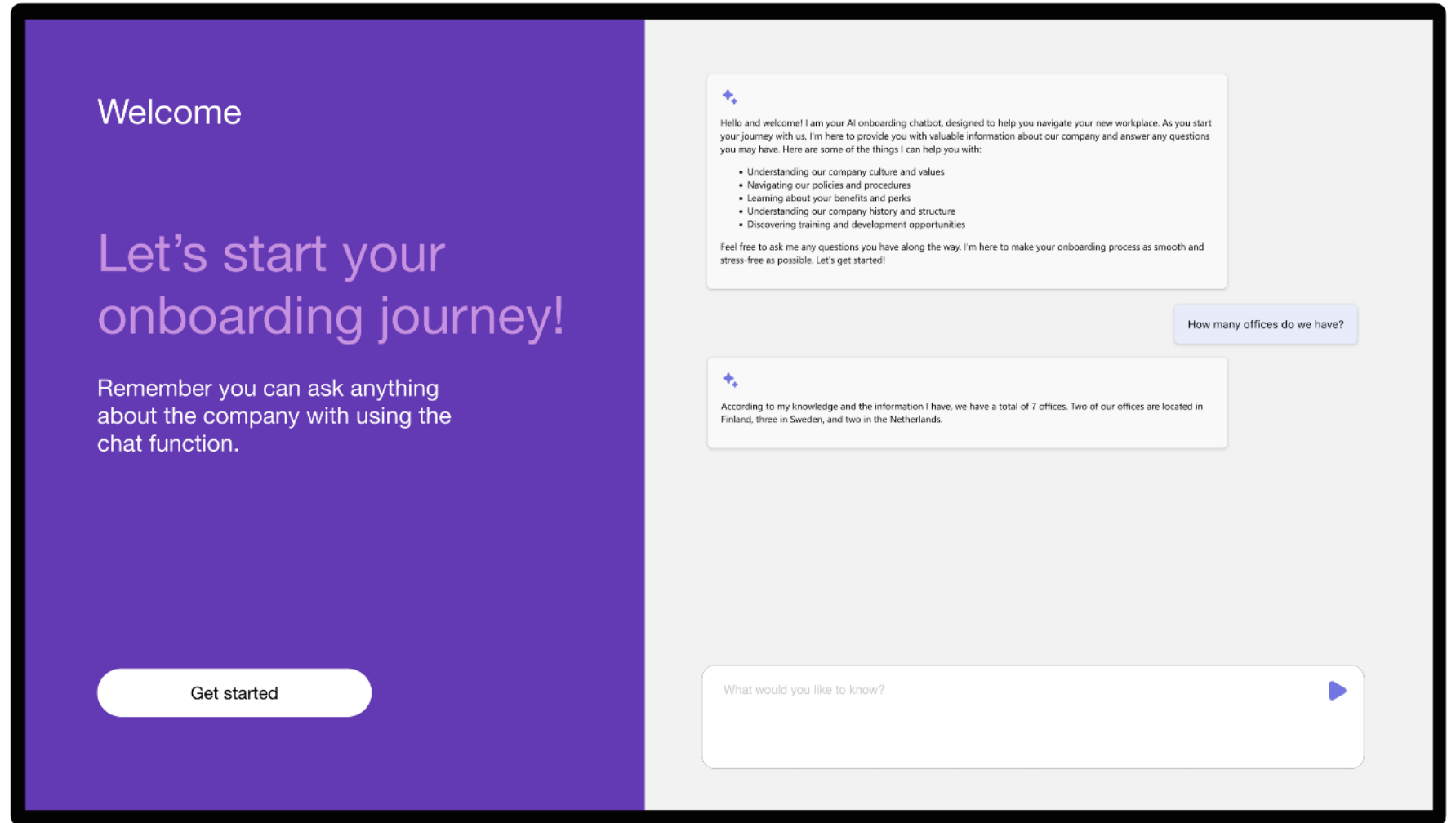


CASE EXAMPLE

Onboarding / HR assistant

Ask any questions about the company with a simple multilingual chat function.

- ✓ Improved onboarding experience
- ✓ All information under one system
- ✓ Improved content management



CASE EXAMPLE

Expert customer service assistant

Website visitor for example can ask any questions about your products from a chat bot – even tough technical ones that usually need a separate person to handle. All this can be built on top of an existing web shop.

- ✓ Improved service quality
- ✓ Always up-to-date information
- ✓ Enhanced customer experience

The screenshot displays the OnlySolar website with a chatbot window titled "Solar Assistant". The chatbot has received the question: "how much power 14 solar panels would give me in a Finnish climate during summer in one day?". The assistant's response explains that power generation depends on factors like panel size, sunlight availability, and orientation. It provides a calculation: 14 panels x 250 watts per panel x 4 hours of sunlight = 14,000 watt-hours or 14 kilowatt-hours (kWh). A disclaimer notes that actual production can vary based on weather conditions, shading, and other factors. The chatbot interface includes a "Contact us" button on the website and a "What would you like to know?" input field with a green play button icon.

Demo

How do you prepare for an uncertain future?





“The best way to predict the
future is to invent it”

Alan Kay



Nicklas Andersson

nicklas.andersson@fellowmind.fi

+46 70 228 3710

Fellowmind Finland

Fellowmind

