

**Deloitte.**

Intelligent Health

Unleashing the Power of  
Data through Scaled  
Deployment of Data  
Products

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Deloitte AG



# Unleashing the Power of Data through Scaled Deployment of Data Products.



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Director in Analytics and Strategy,  
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Head Digital & Data Science Global  
Manufacturing & Supply,  
Takeda



**Peter Hackel**  
Head of Data Products,  
Takeda

Thursday 8th September  
10.45 - 11.45am



# Unleashing the Power of Data through Scaled Deployment of Data Products

Susan Tillmann, Head of Digital & Data Science Global Manufacturing & Supply, Takeda

Peter Hackel, Head of Data Products, Takeda

Nishant Sinha, Director, AI & Automation, Deloitte Switzerland

Basel, September 8<sup>th</sup> 2022



# Agenda



1 Takeda

2 Digital Twin – a Predictive Process Model

3 Unleashing the Power of Data

4 Close

# Our Corporate Philosophy



**Purpose** Better health for people, brighter future for the world.

**Vision** Discover and deliver life-transforming treatments, guided by our commitment to patients, our people and the planet.

**Values: Takeda-ism** We are guided by our values of Takeda-ism which incorporate **Integrity, Fairness, Honesty** and **Perseverance**, with Integrity at the core. They are brought to life through actions based on **Patient-Trust-Reputation-Business**, in that order.

## Imperatives

### PATIENT

- Responsibly translate science into highly innovative, life-changing medicines and vaccines
- Accelerate access to improve lives worldwide

### PEOPLE

- Create an exceptional people experience

### PLANET

- Protect our planet

### UNLEASH THE POWER OF DATA AND DIGITAL

- We strive to transform Takeda into the most trusted, data-driven, outcomes-based biopharmaceutical company



# A Global Biopharmaceutical Company

HEADQUARTERS  
**TOKYO, JAPAN**

GLOBAL HUB  
**CAMBRIDGE,  
MA, USA**

**40** NEW MOLECULAR  
ENTITY CLINICAL  
STAGE ASSETS

PRESENCE: APPROX. IN  
**80** COUNTRIES  
& REGIONS

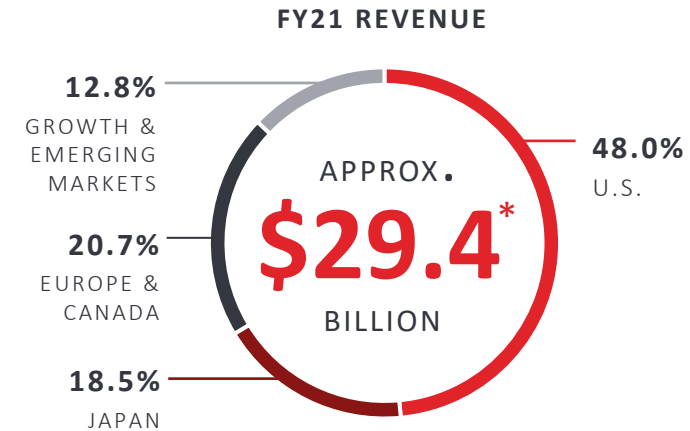
**30** MANUFACTURING  
SITES

**3** RESEARCH  
SITES

**200+**  
PARTNERSHIPS TO HELP  
US BRING INNOVATION  
TO PATIENTS

TOP EMPLOYER® IN  
**39**  
COUNTRIES & 4 REGIONS

ALL NUMBERS AS OF JUNE 2022



\* Convenience translation of reported JPY figures into USD at an average rate of 121.44 JPY/USD. FY2021 revenue amount as of March 31, 2022.



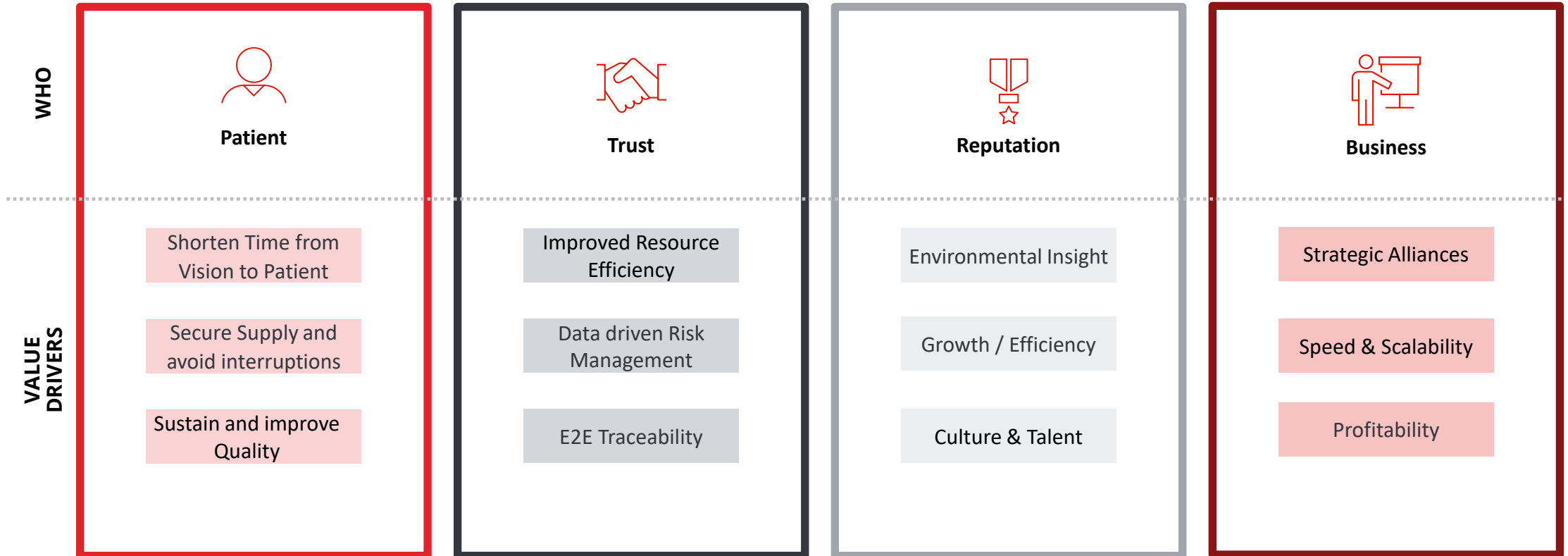
FOUNDED IN  
**1781**  
OSAKA, JAPAN

**OUR  
PEOPLE**

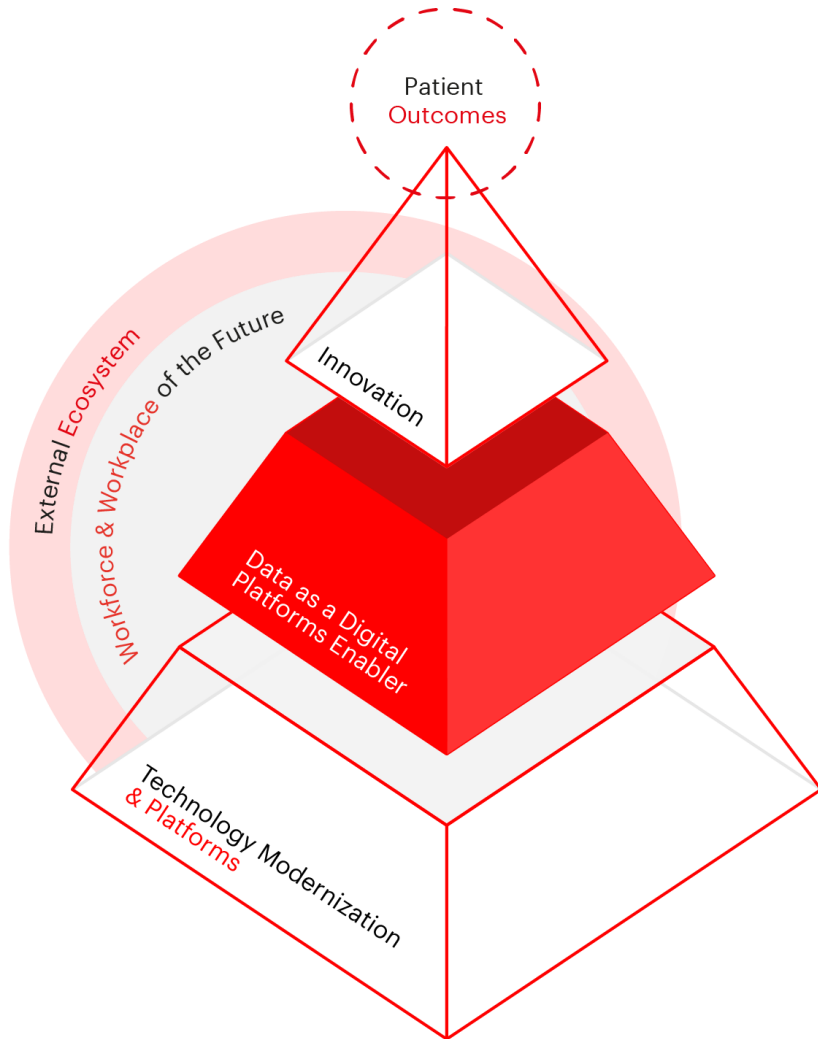
# The Power of Data at Takeda



**PTRB Framework - Takeda strategically uses data to drive value across Patients, Trust, Reputation and Business pillars**



# Our IT Strategy: Data as a Digital Platform Enabler

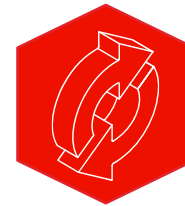


Using predictive analytics, machine learning and AI to help everyone at Takeda spend far more time analyzing and getting value from data and far less time simply managing it. Adding and integrating new data sources easily. Overall enabling a data driven, predictive enterprise.

## We are...



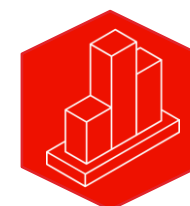
Rationalizing legacy data platforms



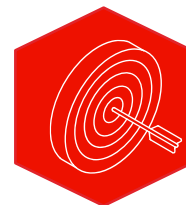
Integrating GMS/GQ data sources (int/ext) into EDB



Contextualizing Data increasing knowledge worker efficiency



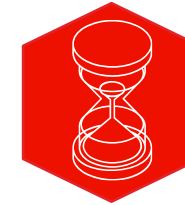
Enabling data use cases and AI/ML at scale



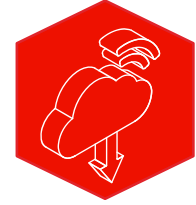
Improving data governance



Internalizing data focused roles



Increasing speed of outcomes at lower cost



Self-service platforms empowering all employees





# Digital Twin

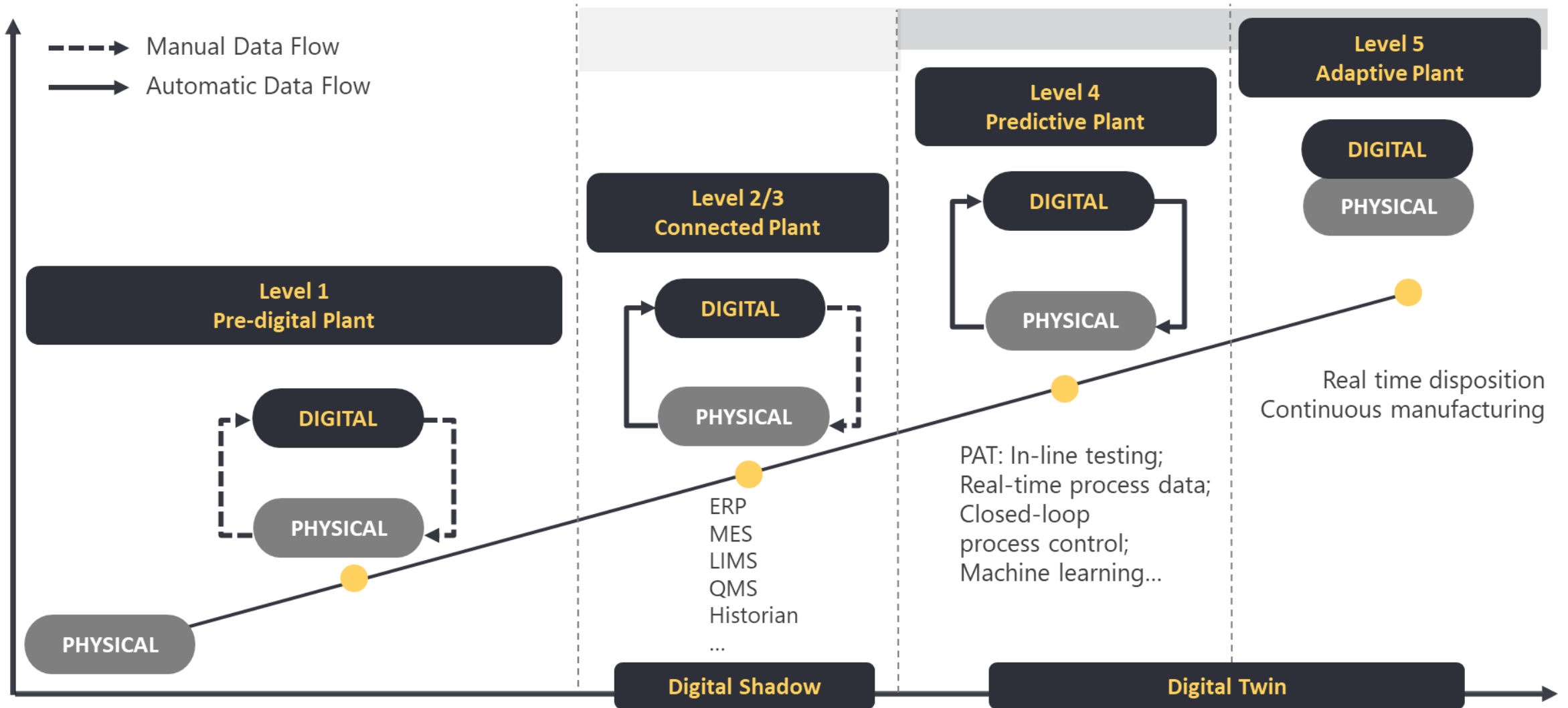


*“A digital twin can be defined as an evolving and near-real-time digital profile of the historical and current behavior of a physical object or process that helps optimize business performance”*

# Digital Twin - Digital Plant Maturity Level



IT North Star systems and data availability define data science potential



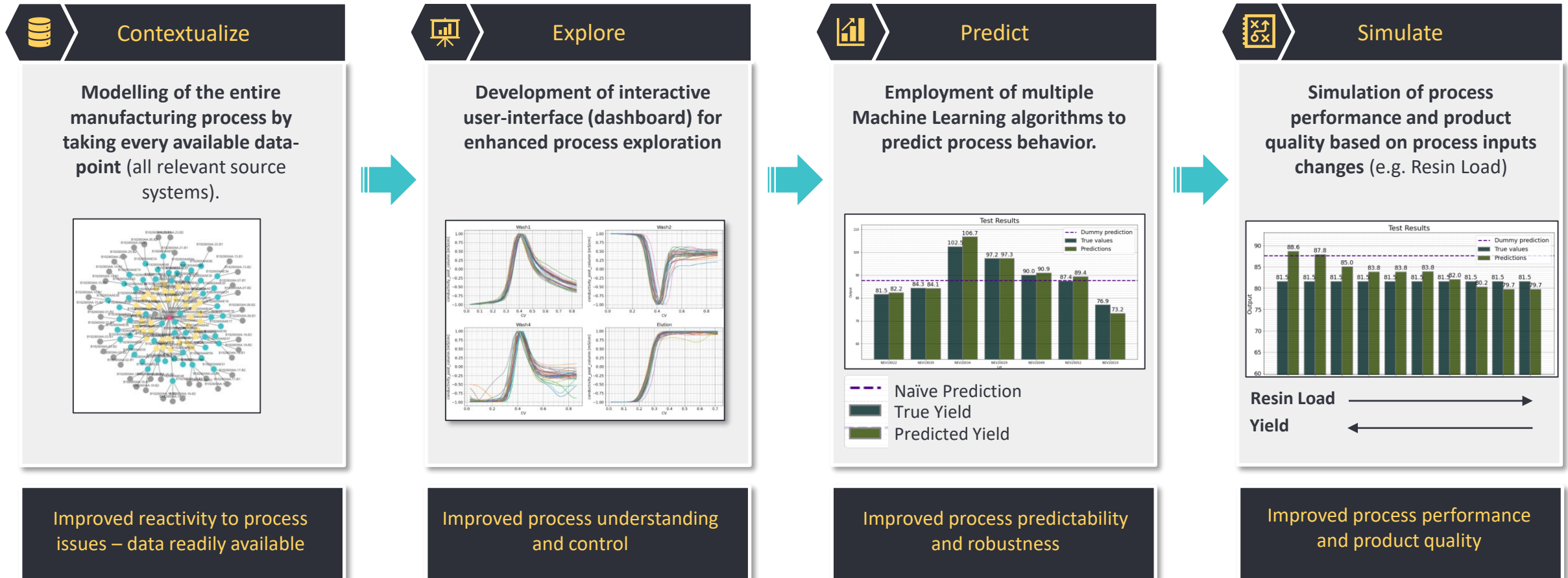
Sources:  
 Industry 4.0 and the digital twin, Deloitte University Press;  
 Digital Twin in manufacturing: A categorical literature review and classification, IFAC-PapersOnLine, Volume 51, Issue 11, 2018, Pages 1016-1022  
 Digital Plant Maturity Model (BioPhorum Operations Group BPOG)

# Data Science Machine Learning: Digital Twin Predictive Process Modelling



## A True Digital Twin for Manufacturing

Many attempts of developing a truly predictive Digital Twin have failed to predict and simulate an entire manufacturing process. Here, we present an end-to-end digital twin with sophisticated simulation capabilities (machine learning).



# Definition of Digital Twin

Simulation Suite – Self Service

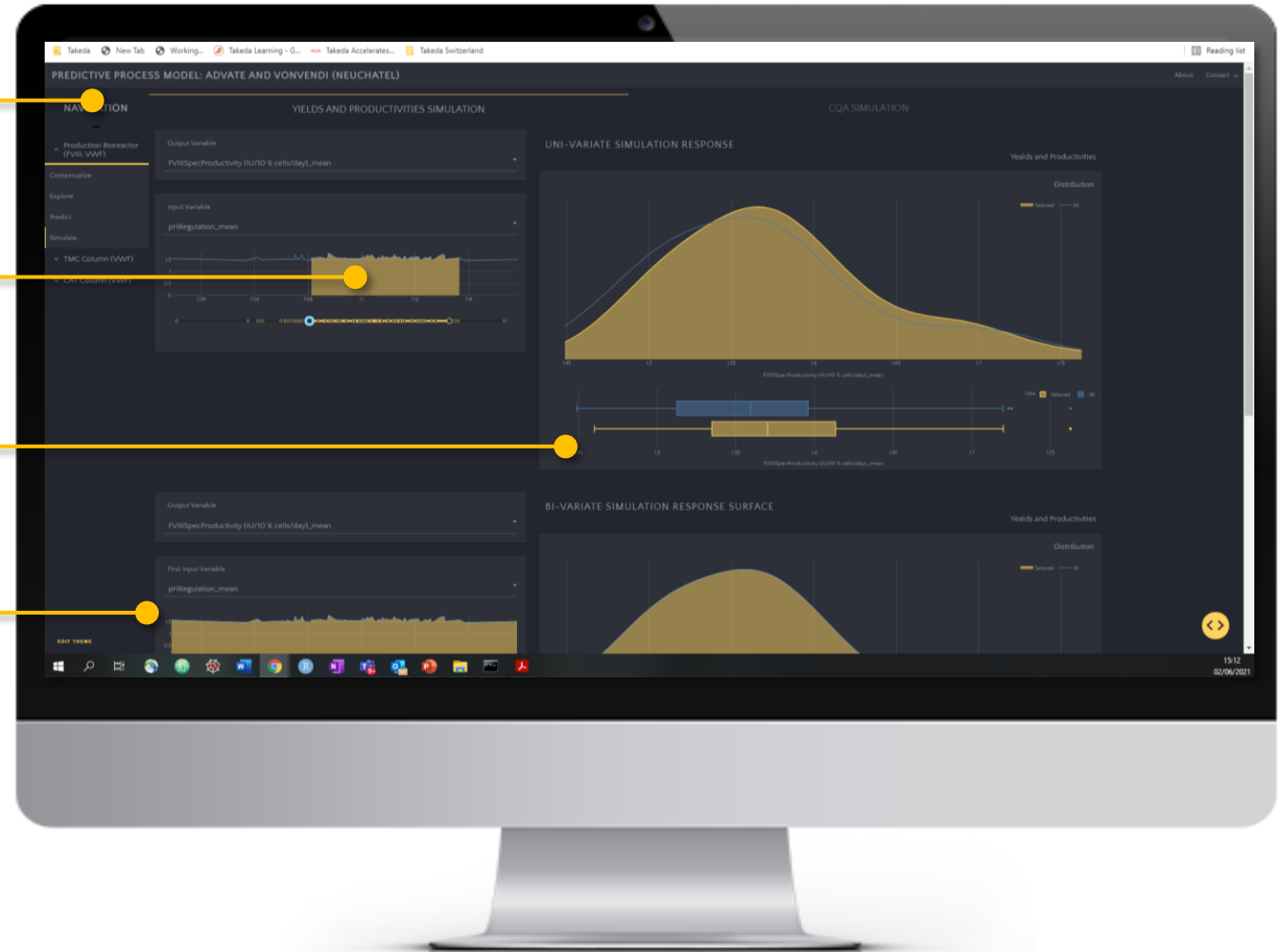


Choose between Performance (Yield/Productivity) and CQA Simulation

Explore Different Process Parameter Settings

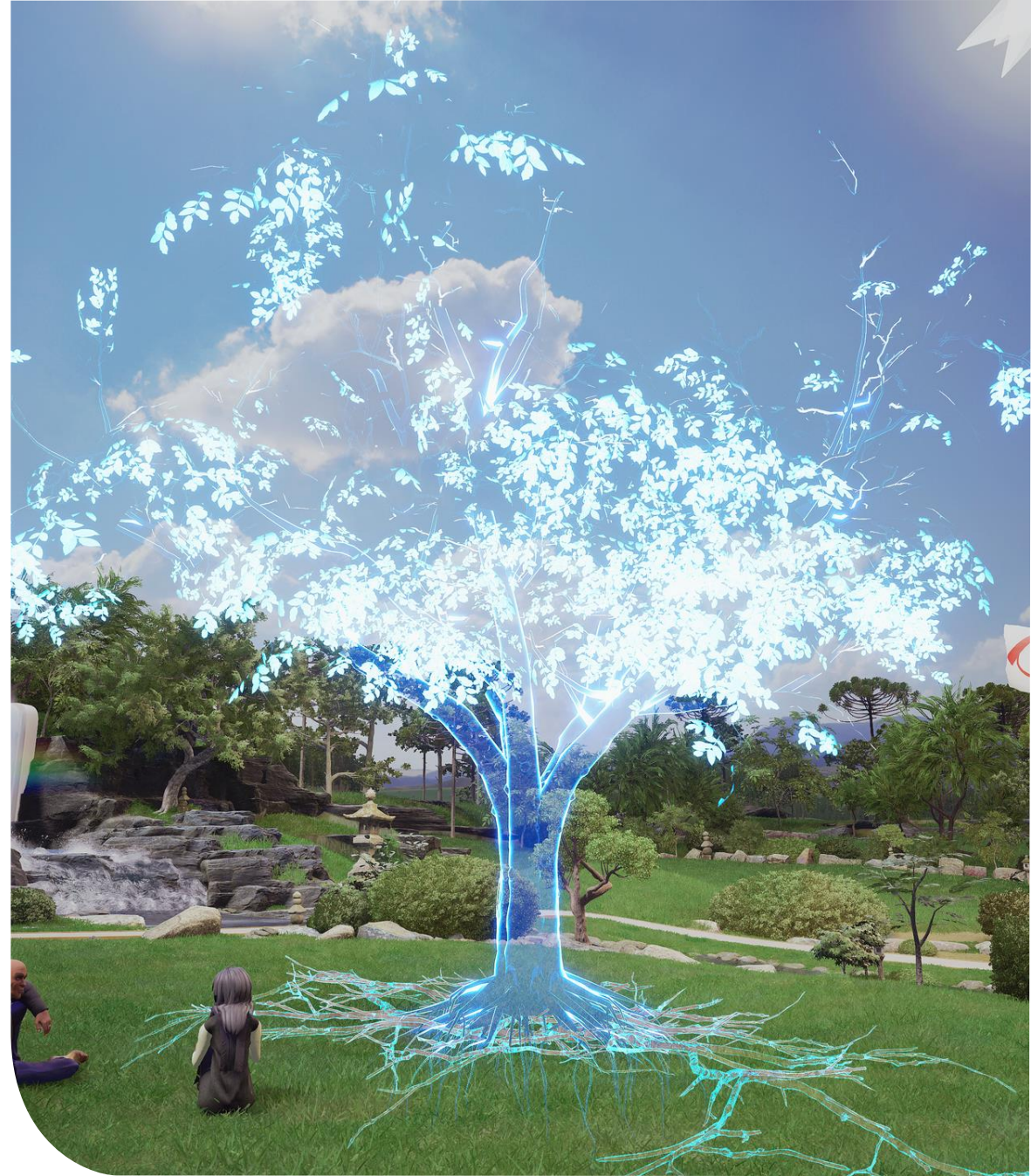
Analyze the Impact of Different Process Parameter Settings on Process Performance and CQAS

Simulate Multiple Parameter Changes at the Same Time





# Unleashing the Power of Data



# GMS GQ data journey to date

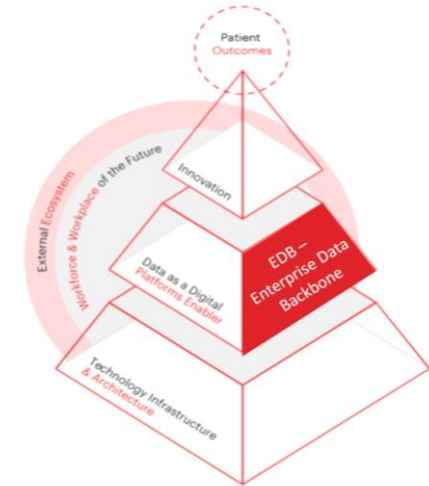


## CHALLENGES

- Fragmented and isolated data sources
- Finding & Analysing Data
- Data availability
- Holding back digital change and utilization of data and digital capabilities

## SOLUTION- THE ENTERPRISE DATA BACKBONE (EDB)

A **single, enterprise wide** Amazon Web Services (AWS) **cloud data platform**. Ultimately, all enterprise data will be hosted in EDB, and **various products, services and data capabilities will be enabled by EDB.**



### The Foundation: GMSGQ Data Lake



The **single source of truth** and **foundation** on which we build

### The Catalyst: GMSGQ Data Model Domain Specific Data Product



Streamlined data contextualization and modelling **speeds up** the **development and deployment** of data products

### The Value Drivers: GMSGQ Use Case Delivery



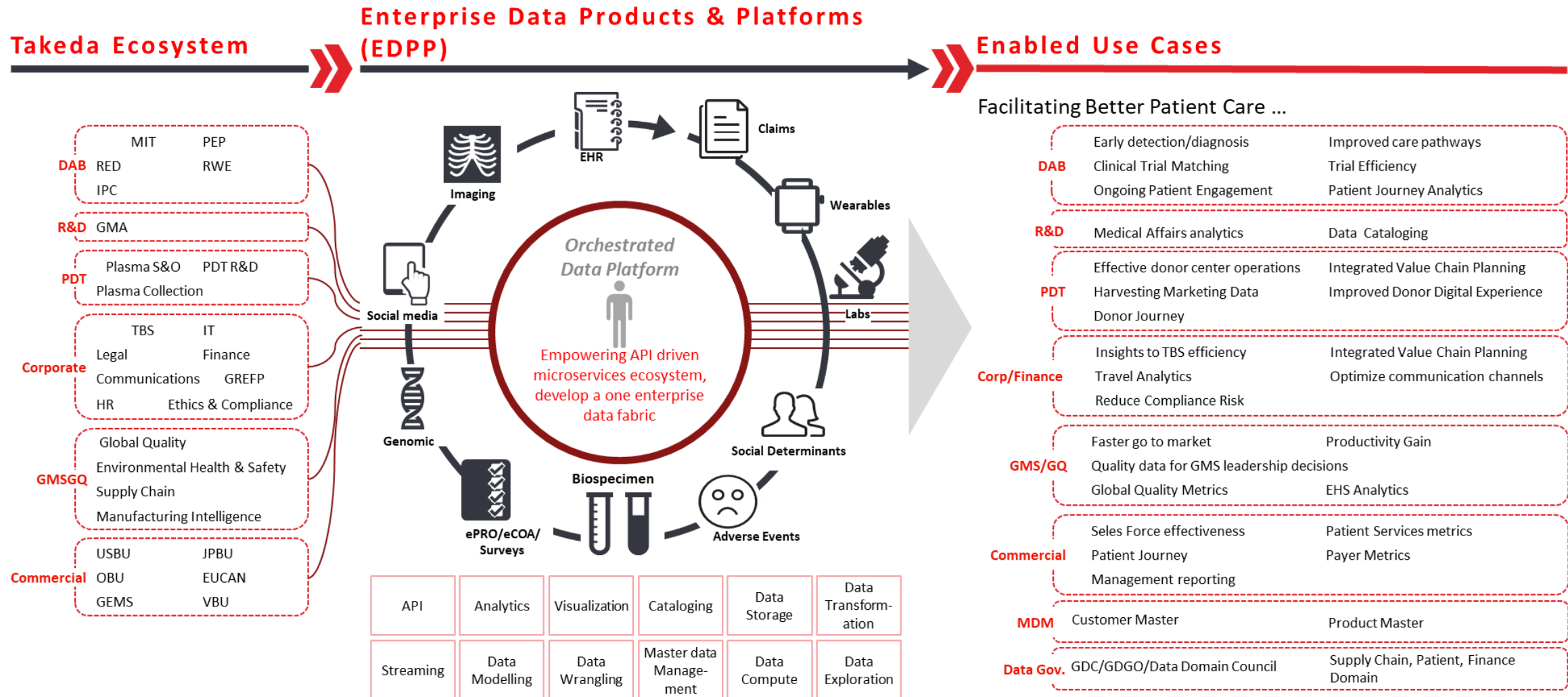
Analytics, visualization and business intelligence allow end users to take **data driven decisions**

### The Future: GMSGQ Digital Natives



End users upskilled, and **intuitively using data products** in their daily work for improved **value and data driven decision making**, business intelligence and operational excellence

# EDB provides the platform and data capabilities to power Takeda's global enterprise data ecosystem



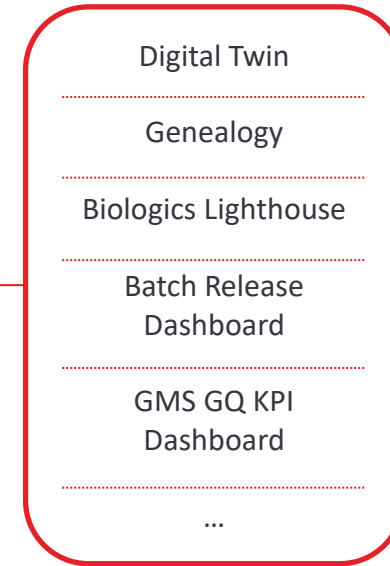
An orchestrated enterprise data strategy and management approach optimizes the feedback loop btw data program inputs and use case outputs



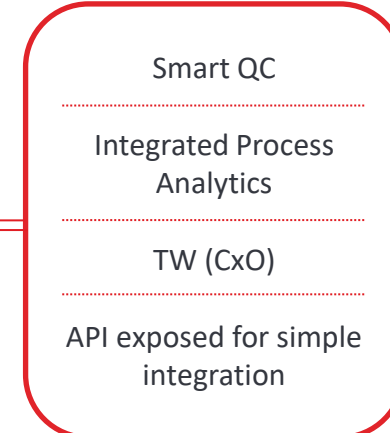
# GMS GQ Data Environment



## Analytics Data Product



## Standardized Application Interfacing



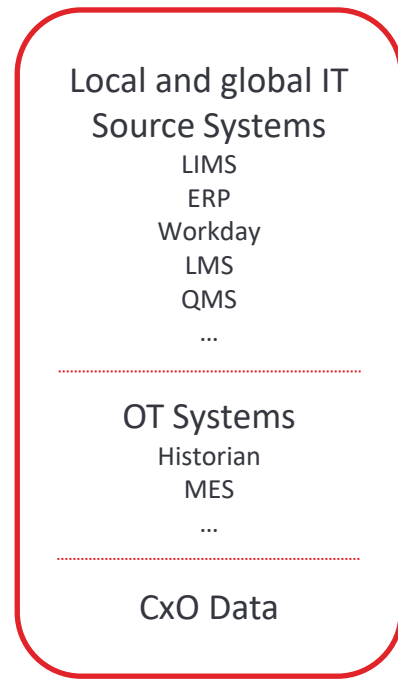
## GMS GQ Data Model Foundational Data Product - DDM



## GMS GQ Data Lake



## System of Record



Minimum to none direct access to Source

Access approved by Source Owner, standardized processes and governance

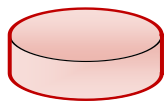
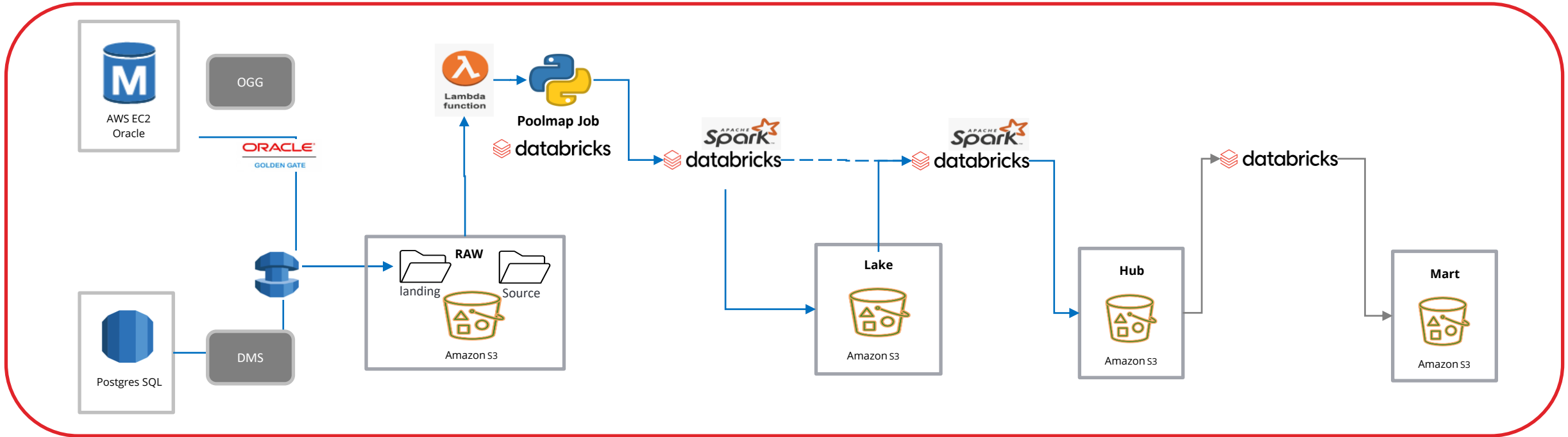
Broad access governed by global Domain Data Owner

## Data Access and Utilization

# The build of Near Real Time consumption



AWS



61 GMS Specific Source Systems

& many non GMS Systems



**30s – 5min**  
from data creation



Takeda Data Lake

Raw Data in System native format



**5min – 12min**  
from data creation

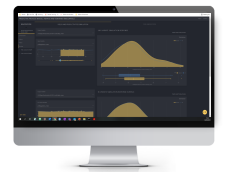


Takeda Data Model

Managed Data in standardized Data Domain Model



**6min – 15min**  
from data creation  
(x = depending on complexity)



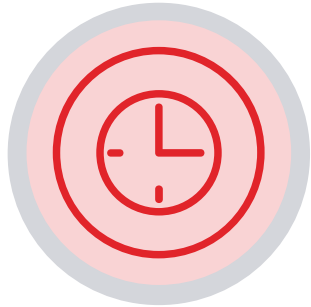
Takeda Use Case

Data within respective Use case

# Value generated



Enabling direct access to structured, quality data is leads to ...



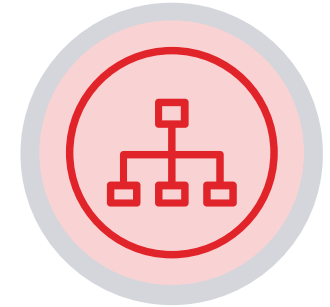
**Time savings**



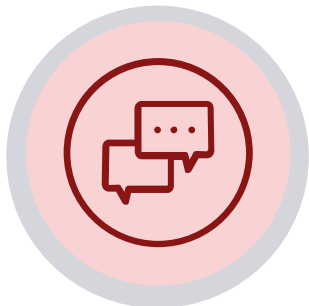
**Improved accuracy**



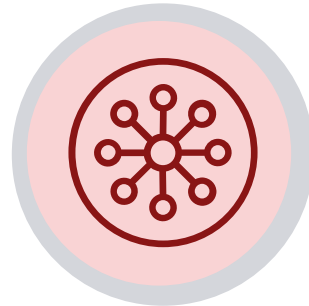
**Standardization**



**Organization & visibility  
of data**



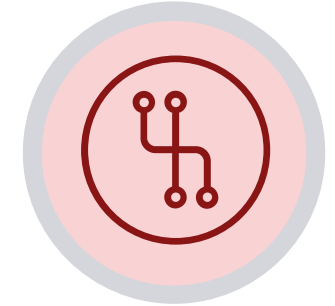
**Enhanced  
collaboration**



**Innovative  
solutions**



**Insights for  
decision making**

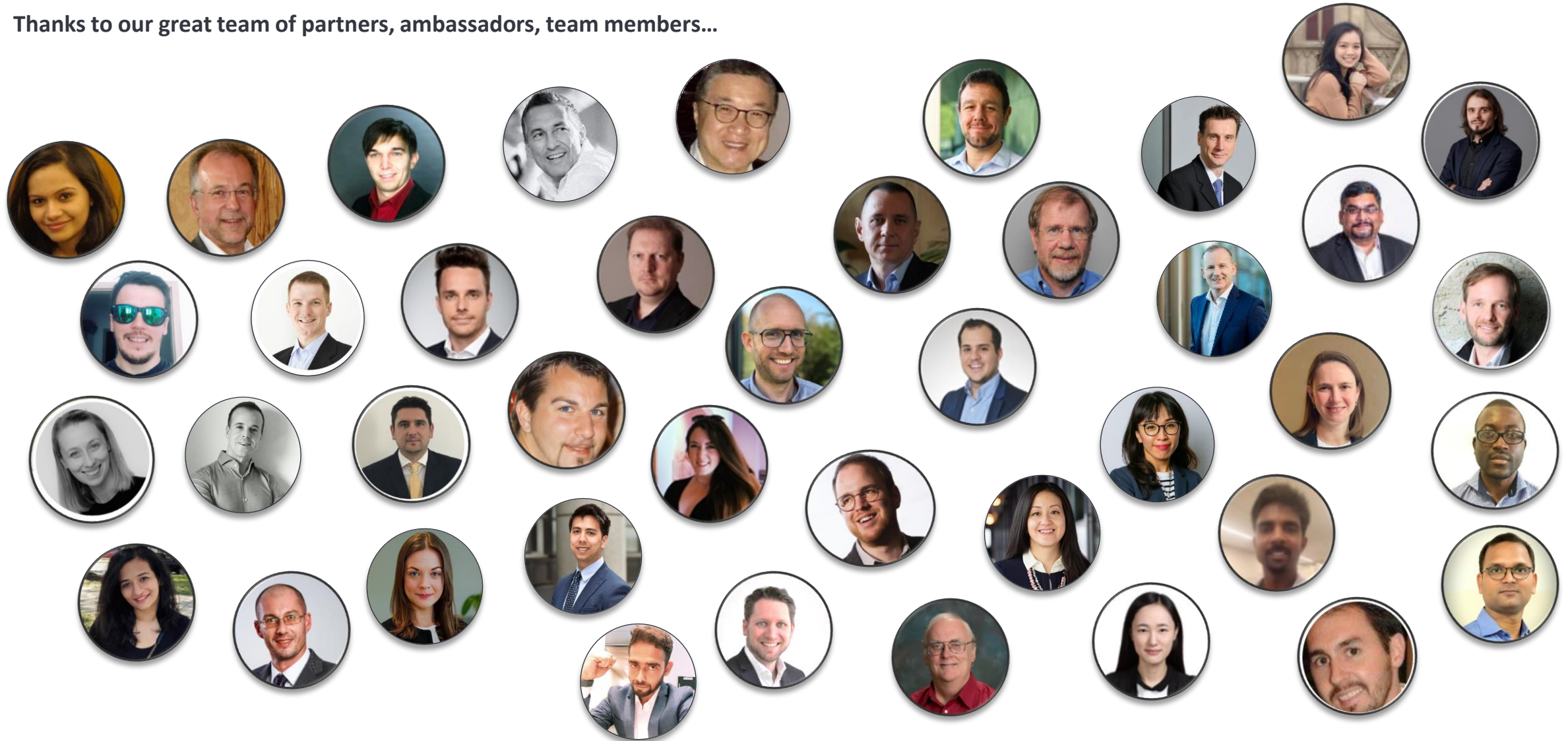


**Automation of  
manual efforts**


# A true collaborative effort



Thanks to our great team of partners, ambassadors, team members...



...and all the others supporting the journey!!



**How do you unleash  
the power of data?**

