Advanced analytics and predictive modeling in pharma supply chain

Global Pharma Supply Chain & Logistics Forum

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Aliz Cser

Supply Chain Performance Management Analyst

Global Supply Chain Excellence

Better Health, Brighter Future

Our History 1781 – 1979

1781

COMPANY FOUNDED

Chobei Takeda I sets up his business in Osaka

1871

INTERNATIONAL TRADE

Takeda pioneers in the importation of western medicines

1895

PRODUCTION

Pharmaceutical manufacturing begins in Takeda's factory

1915

OSAKA FACTORY

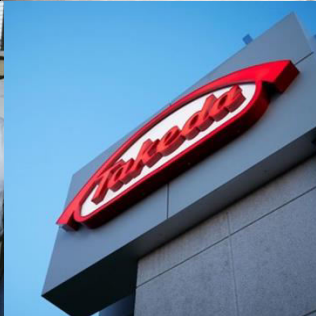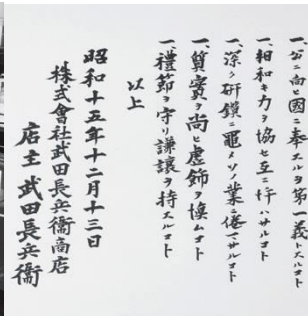Opens as "Takeda Pharmaceutical Manufacturing Plant"

1946

HIKARI FACTORY

Opens in Yamaguchi prefecture

1951

INTERNATIONAL BUSINESS

Starts with North and Central America and Asia

2008

MILLENNIUM PHARMACEUTICALS

acquisition enhances innovation in oncology

2011

NYCOMED AQUISITION

expands Takeda's global footprint into more than 70 countries worldwide

2018

NEW YORK STOCK EXCHANGE LISTING

The only pharmaceutical company listed on both the TSE and the NYSE

SHONAN HEALTH INNOVATION PARK

opens as the first pharma-led open innovation ecosystem in Japan

TAKEDA GLOBAL HEADQUARTERS

opens in Tokyo, providing an environment that supports diverse workstyles

2019

SHIRE ACQUISITION

makes Takeda a global biopharmaceutical leader with a presence in approximately 80 countries

Takeda's 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	Patient-Trust-Reputation-Business, in that order Our values of Takeda-ism incorporate Integrity, Fairness, Honesty, and Perseverance, with Integrity at the core. We bring our values of Takeda-ism to life through actions based on Patient-Trust-Reputation-Business, in that order, symbolized by the four waterfalls.

IMPERATIVES

PATIENT	**PEOPLE**	**PLANET**
Responsibly translate science into highly innovative, life-changing medicines and vaccines. Accelerate access to improve lives worldwide.	Create an exceptional people experience.	Protect our planet.

DATA AND DIGITAL
Unleash the power of data and digital.

R&D Focus & Engine

We are a patient driven, science first R&D organization. We combine our focus on core therapeutic areas with cutting edge technology. We work across four innovative biopharma areas and two business priorities.

Innovative Biopharma

ONCOLOGY

RARE DISEASES

NEUROSCIENCE

GASTROINTESTINAL & INFLAMMATION

PLASMA-DERIVED THERAPIES IMMUNOLOGY
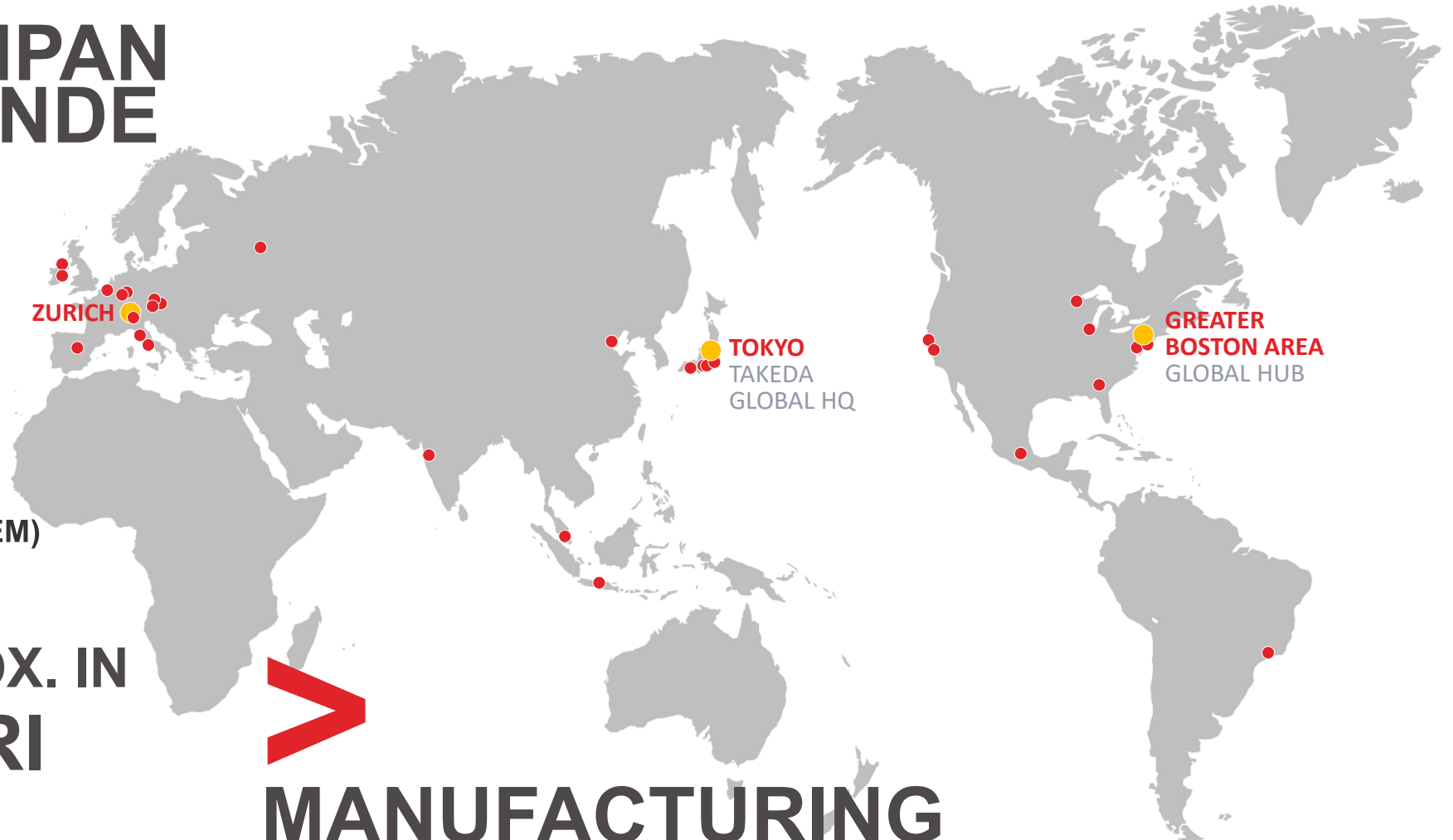
VACCINES

Takeda Global Network

Takeda

1781 COMPANY FOUNDED

OPERATE FROM **5** REGIONS

- Japan
- U.S.A.
- Europe & Canada (EUCAN)
- Growth & Emerging Markets (GEM)
- China

PRESENCE: APPROX. IN **80** COUNTRIES
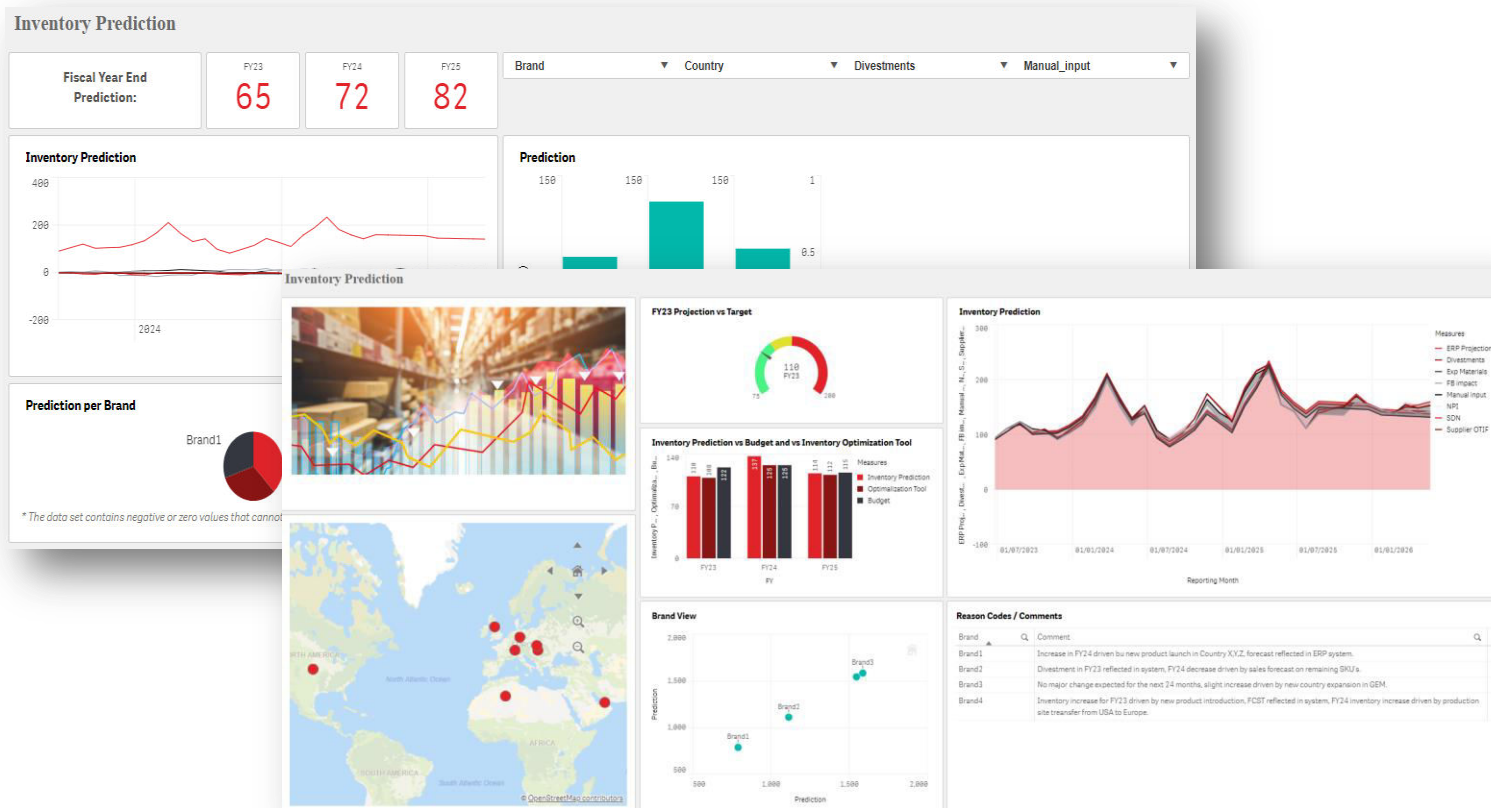
> 25 MANUFACTURING SITES

ZURICH

TOKYO
TAKEDA GLOBAL HQ

GREATER BOSTON AREA
GLOBAL HUB

Global Takeda Inventory Performance Management journey

2019

Shire Acquisition / Harmonization

Shire acquisition completed, ERP* and KPI* harmonization started

Performance Dialogue, targets based on external benchmark and growth

2019

Supply Chain top level reporting

Supply Chain Inventory Reporting per OPU*/Brand, is available with limited details and no self-service/user friendly access to users

2020

One Stop Shop Dashboard

One Stop Shop reporting, self-service, user friendly, more automated

2021

E2E Integrated One Stop Shop Dashboard

E2E Global Takeda Inventory Performance Management – including perpetual inventory and financial data – one source of truth

2022

Advanced Reporting Insights and Analytics

Fully connected with Planning System, Inventory Optimization, Advanced Analytics – KPI correlation

2023

Forward Looking Predictive Analytics

Inventory Prediction model

Predictive analytics, machine learning, Artificial Intelligence

*KPI – Key Performance Indicator

ERP – Enterprise Resource Planning

OPU – Operating Unit (e.g. Division)

Forward looking approach – Inventory Prediction Mockup

Value proposition:

- Used by Supply Chain and Finance community

- Performance dialogues with Operating Units and Regions

- Year End planning, Financial planning

- Identify opportunities for inventory optimalization

- Warehouse capacity planning

- Manufacturing capacity planning

- Future alerts , inventory ageing and slow movers projection

Forward looking approach – Inventory Prediction Data Processing

ERP* + Planning system Projection

KPI* correlation elements (FA,FB*, production yield…)

Financial journeys
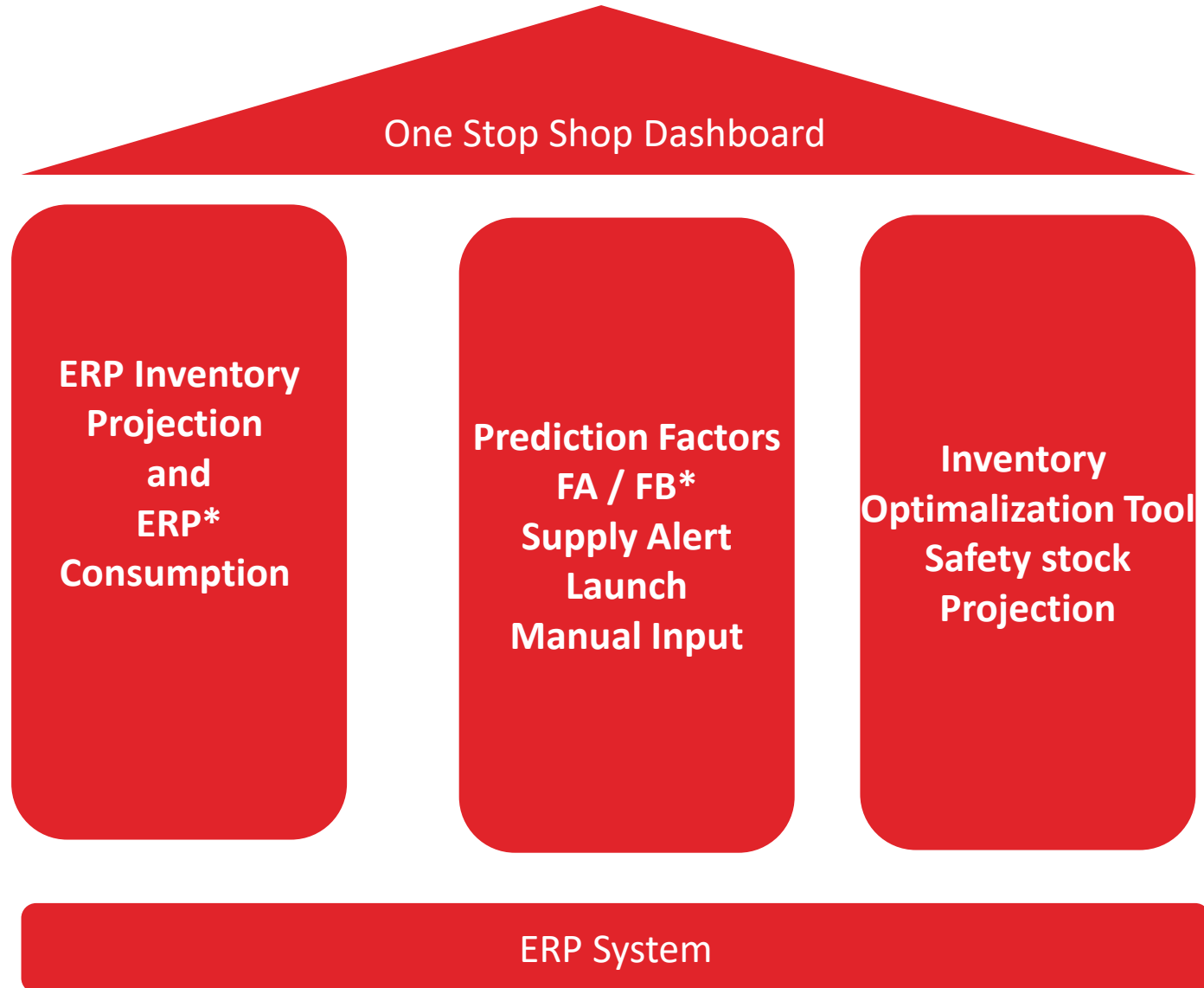
Manual adjustments

Artificial Intelligence Tool

Outcome: Based on best model Inventory Prediction

Outcome - > compare with Budget / multi-echelon inventory optimalization tool result

Visualization

Compare with Budget / multi-echelon inventory optimalization tool result

*ERP – Enterprise Resource Planning

KPI – Key Performance Indicator

FA – Forecast Accuracy / FB – Forecast Bias

Forward looking approach - Takeda Inventory Projection Footprint

One Stop Shop Dashboard

ERP Inventory Projection and ERP* Consumption

Prediction Factors FA / FB* Supply Alert Launch Manual Input

Inventory Optimalization Tool Safety stock Projection

ERP System

- Automated data flow
- Data available for everyone
- More data granularity
- Monthly Performance Dialogues to understand trends
- Secondary KPI tracking

*ERP – Enterprise Resource Planning

FA – Forecast Accuracy / FB – Forecast Bias

Forward looking approach – Inventory Prediction

Challenges…

- Data consistency: different key figures in planning system, the business process not always aligned
- Communication: if they change something in process, lack of communication
- Data architecture, connection establishment
- Planning levels in planning system (material type / Bill Of Material)
- Organizational challenges, change management

… vs Opportunities……

- External Artificial Intelligence tool
- Unlimited further used cases
- Supply Chain Planning, Manufacturing capacity planning, Procurement, Warehouse Management, Transportation planning
- Financial planning: MRP planning, Year end closing, Budget planning

THANK YOU!