

# **Business Strategy Briefing**

**TOYO's Digital Transformation :  
Challenging six-fold productivity and sustained value creation**

**December 10, 2024**

**Toyo Engineering Corporation**

**DXoT Promotion Department Manager**

**Noriaki Seo**



## Today's Agenda

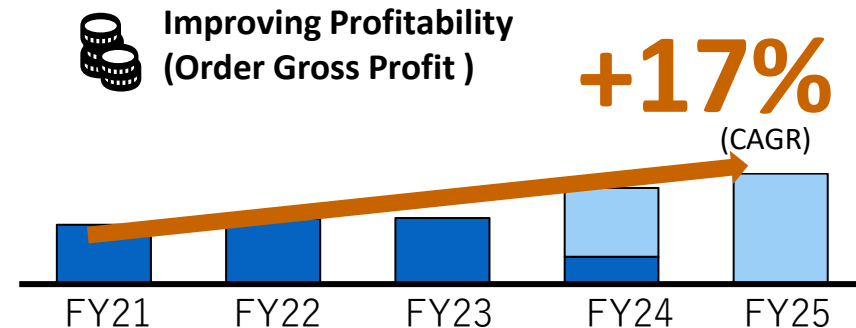
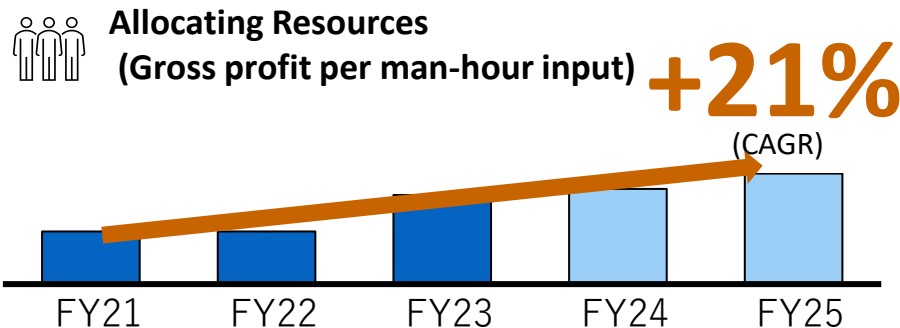
1. Background to DX Innovation and Value Creation
2. The Challenge of Sixfold Productivity:  
Expanding DX Strategies and Projected Profit Growth
3. Tangible Results:  
Concrete Examples and Returns Achieved
4. Future Outlook:  
Growing Profit Opportunities and Sustainable Growth
5. Summary

## DX in the Mid-Term Management Plan 2021-2025

By improving productivity in the EPC domain, we enhance our competitive advantage, create high-value-added projects, and increase profitability. Allocating resources to development enables us to pursue sustainable value creation.



Enhancing the TOYO Group's productivity to strengthen profitability while allocating resources to develop new technologies and businesses, thereby establishing a foundation for future revenue growth.



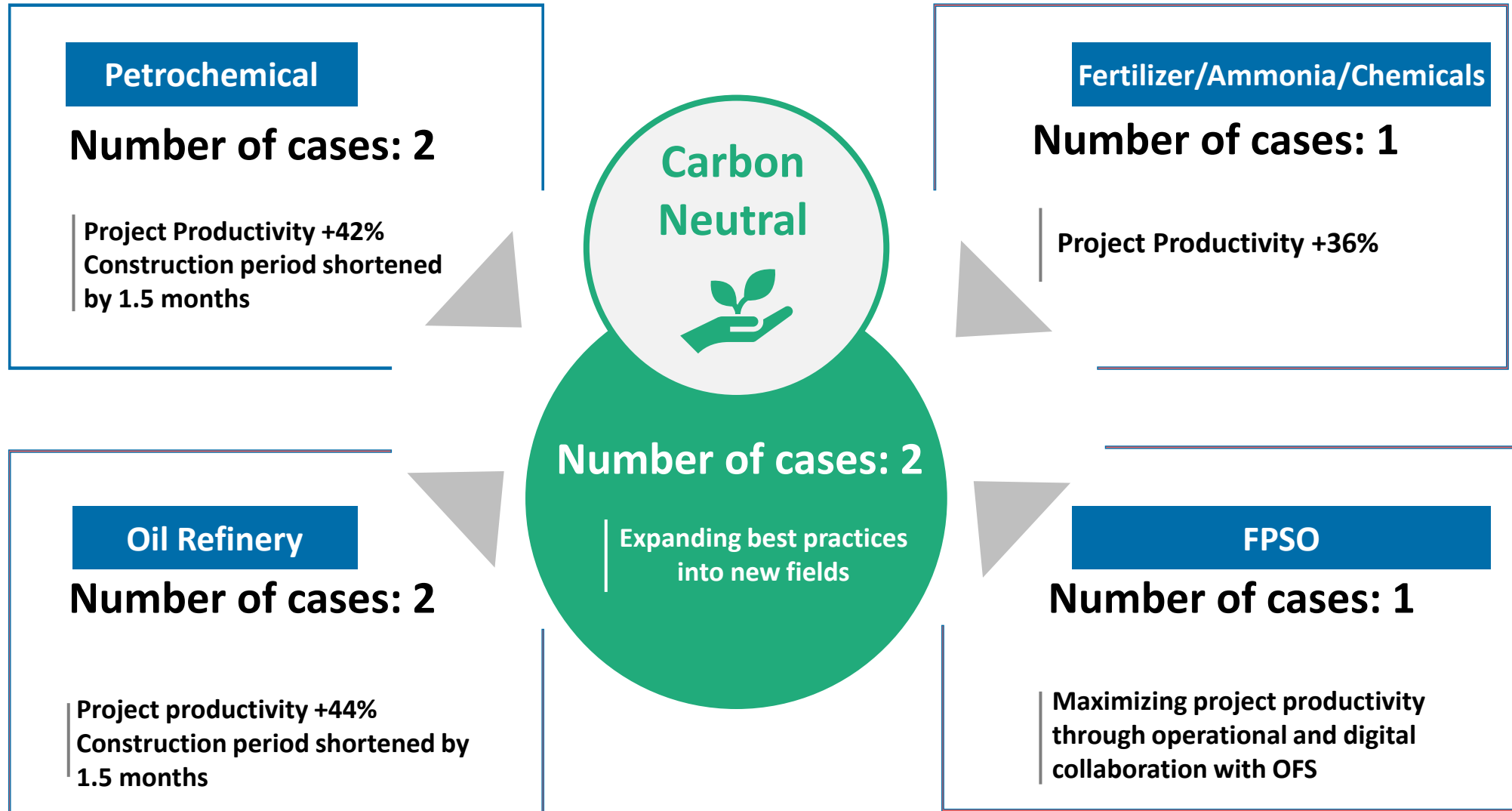
Unreceived Orders  
Received Orders

\*For FY25, the DX application effects are considered under the assumption that conditions remain equivalent to FY24.

The expected values are based on the following assumptions as of the end of March 2026 : DX development progress at 50%, applicability to proposal projects at 75%, and harvesting rate at 50%.

## Expanding the Business Domains of DX Application

We are applying DX across all EPC projects to improve project productivity. By advancing DX application in the carbon-neutral domain, we aim to mitigate risks while delivering higher value-added project services.



## The Challenge of Sixfold Productivity Increase

From FY2025 onwards, the effects of digital transformation will be the main driving force. Productivity improvements, particularly in EPC, are expected to accelerate the transformation of TOYO's business portfolio.

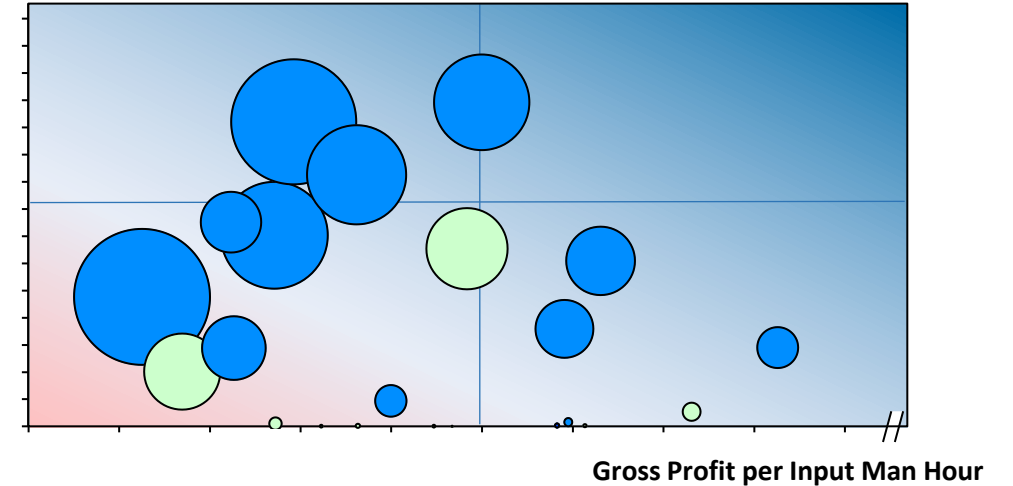
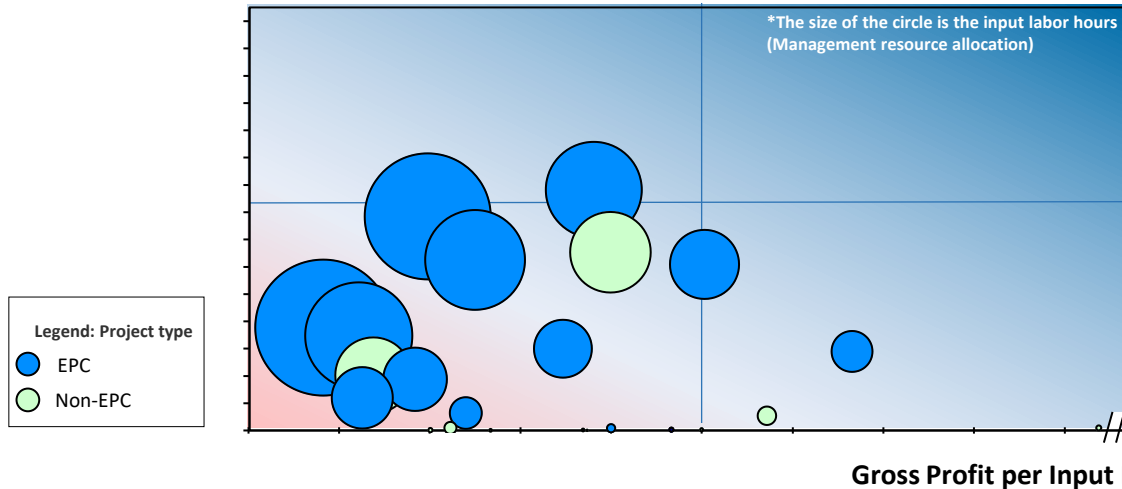
### Potential for Profitability Improvement in Prospective Projects through DX Application

Before DX application FY25-26 projects

After DX application FY25-26 projects

Order Gross Profit

Order Gross Profit



**DX**

Order gross profit up by 20%  
Gross profit per input man-hour up by 23%

With DX application

- Considering the potential contribution of DX application for each project to improving order gross profit and reducing resource demand (The expected values are based on the following assumptions as of the end of March 2026 : DX development progress at 50%, applicability to proposal projects at 75%, and harvesting rate at 50%.)



Physical space (real space)

Construction equipment location information



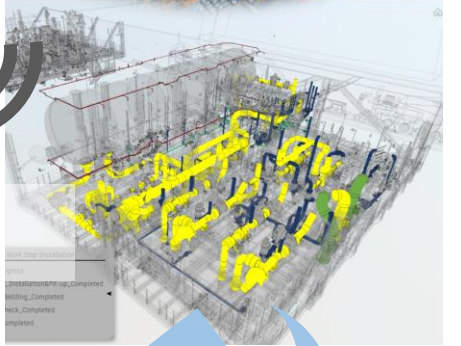
RFID Site Delivery Material Status



Worker Location



Construction status



Real-time data acquisition

Cyberspace (Virtual Space)

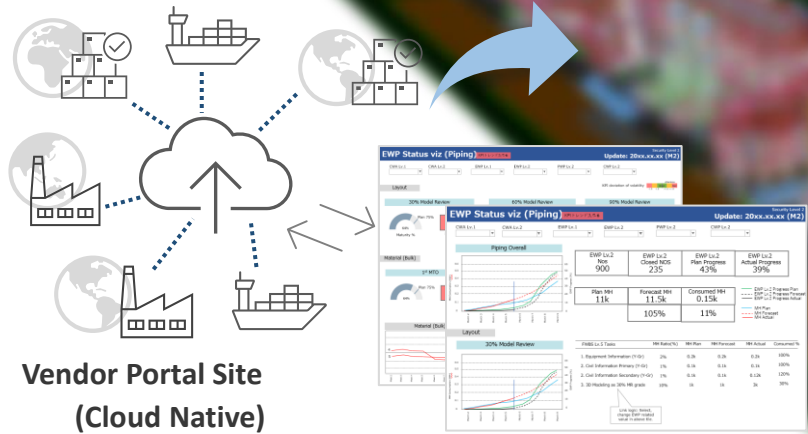
feedback

Synchronizing with Virtual Construction Models

# Digital Twin



Data-Centric Engineering (Cloud Native)



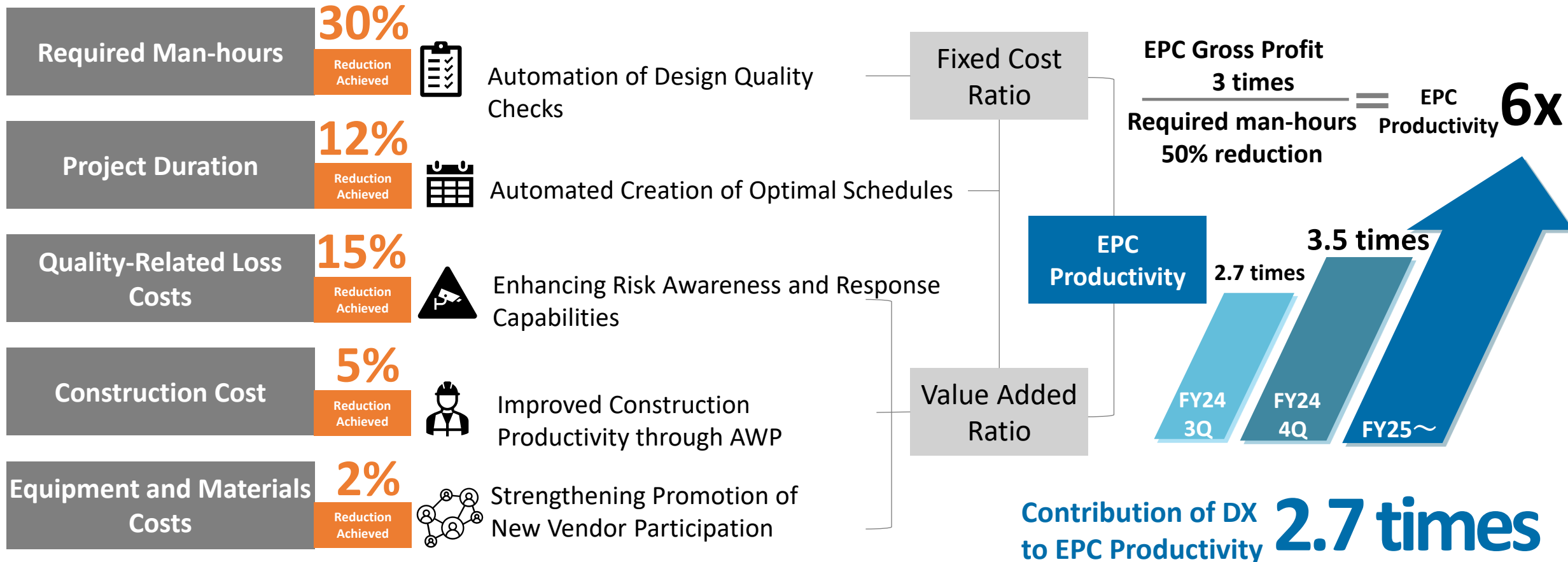
Vendor Portal Site (Cloud Native)

Please watch the video from the following link

<https://youtu.be/KUoEkJ8My0s>

## Building value creation processes and mechanisms to achieve sustainable growth through business transformation and digitalization

By implementing action-level DX initiatives and integrating them into a KPI tree structure, EPC productivity has increased by 2.7 times. Plans are underway to enhance each KPI and increase EPC productivity sixfold by FY2025.



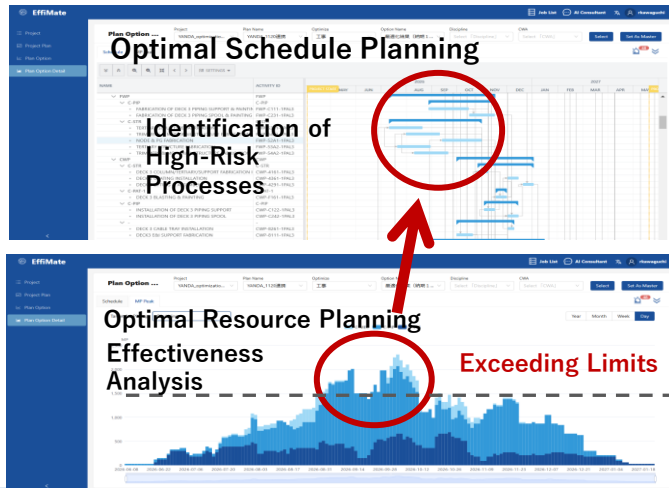


# Identifying and Eliminating Execution Risks

Strengthening risk management through optimization of the planning process and developing an optimal plan for shortening the construction period.

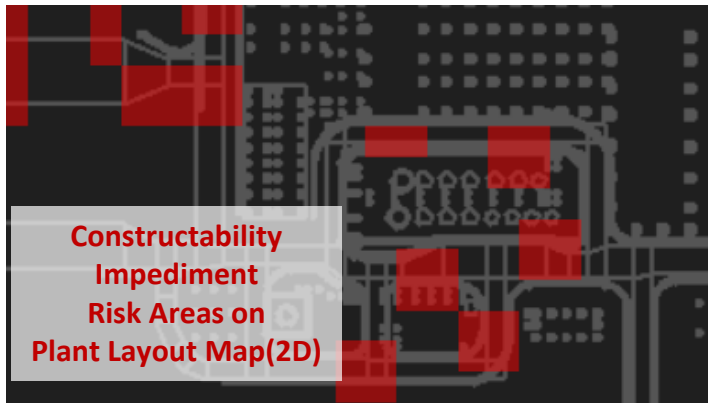
## Overall Optimization of Project Schedules

Integrated Evaluation of Resources and Processes Using Simulation Function



Utilizing knowledge of past troubles

AI identifies risk-prone areas based on previously occurred troubles

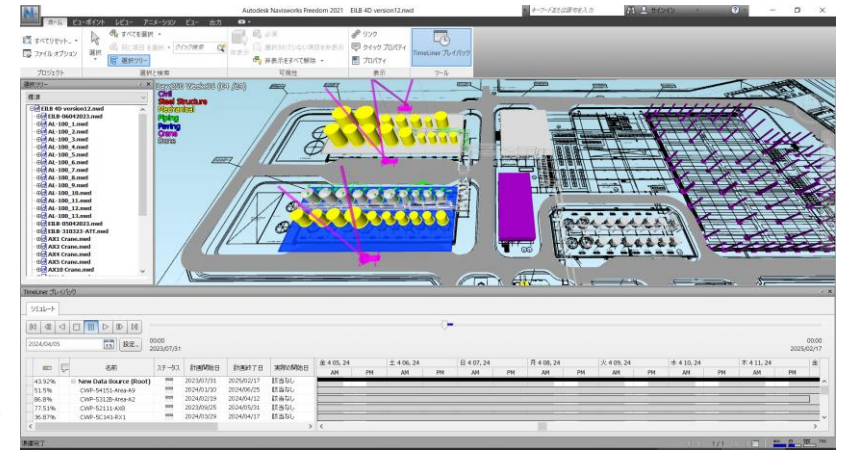


Construction period shortened by 1.5 months due to Overall Project Optimization



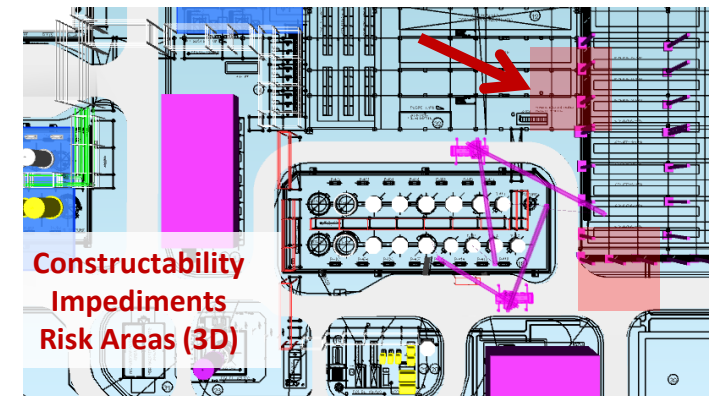
## Shortening the Construction Period and Project Productivity Evaluation

Evaluation of Construction Processes Using 4D Simulation



Minimization of Construction Trouble Risks

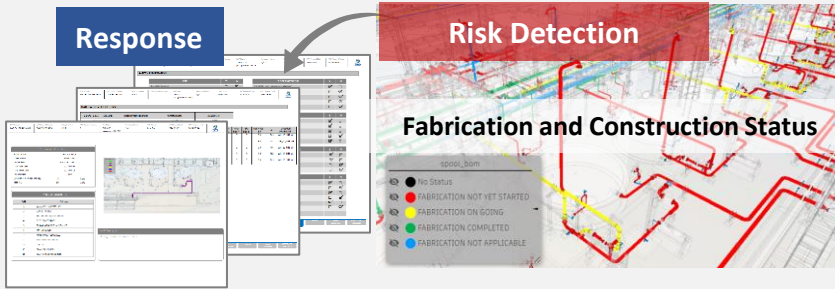
Risk identification in 3D models, and Its Reflection in Design



# Stable Value Creation through High-Precision Project Execution and Management

Enhanced "risk detection capabilities" and "response capabilities" achieved through precise planning and advanced risk management.

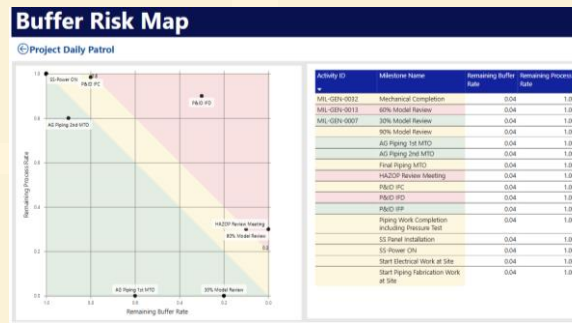
## 04 Construction Site Risks



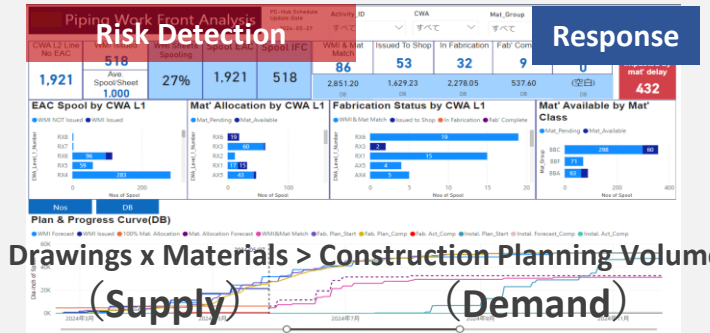
Detailed Construction Instructions Real-time Monitoring of On-site Conditions

Minimizing the Gap Between Planning and Execution

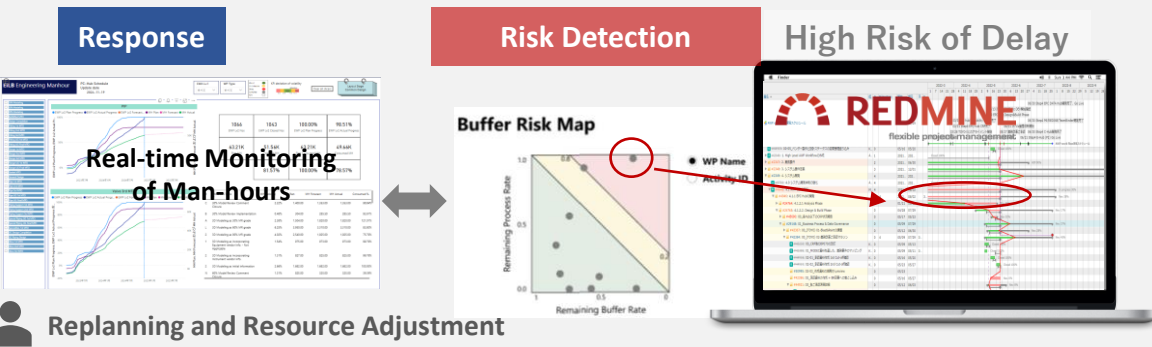
Aggregating performance data to avoid cost overruns and delays.



## 03 Drawing and Material Delay Risks



## 01 Engineering Delay Risks



Replanning and Resource Adjustment

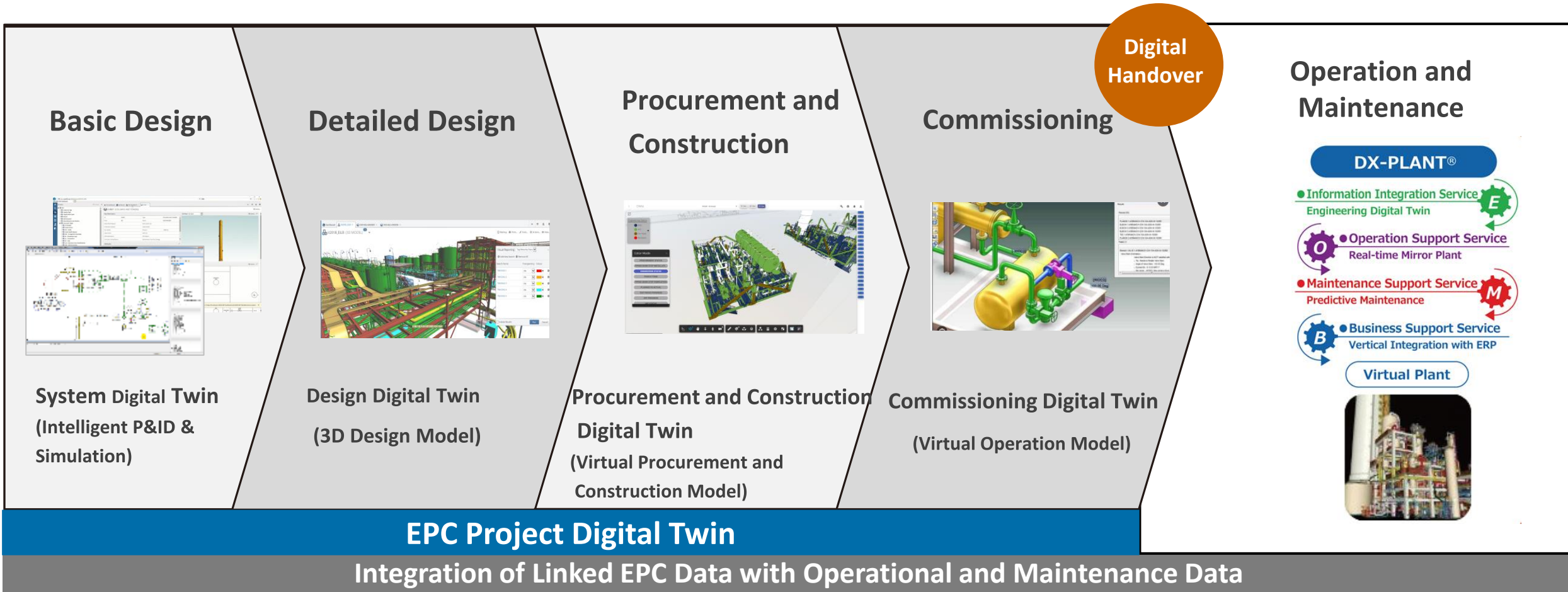
## 02 Construction Planning Risks



Improving Planning Accuracy Through a Phased Approach

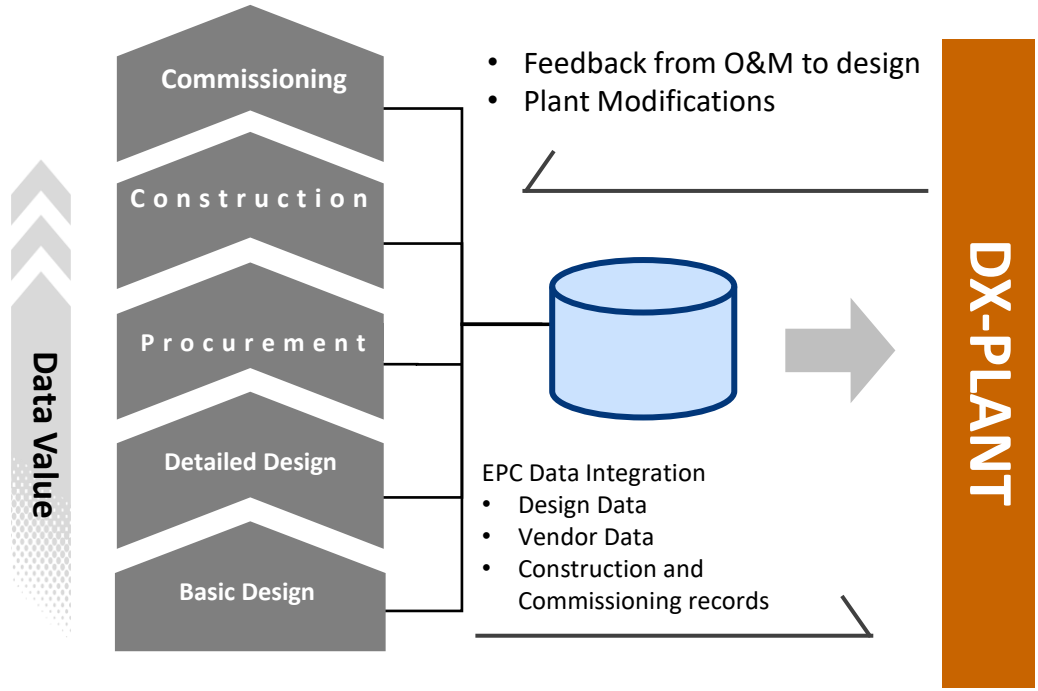
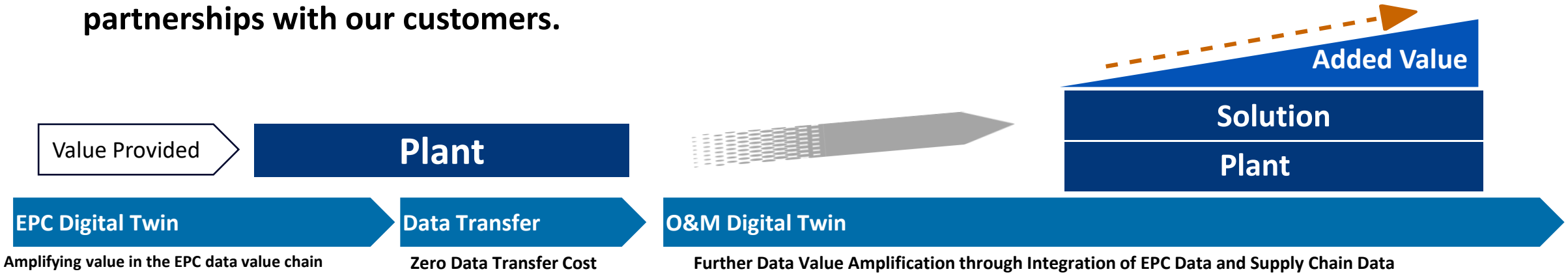
## Digital Twin for Realizing the Plant Life Cycle

Starting with enhancing added value in EPC, we provide high-quality design data and equipment information. We realize efficient maintenance planning and rapid troubleshooting, contributing to customer growth and the achievement of a sustainable society.



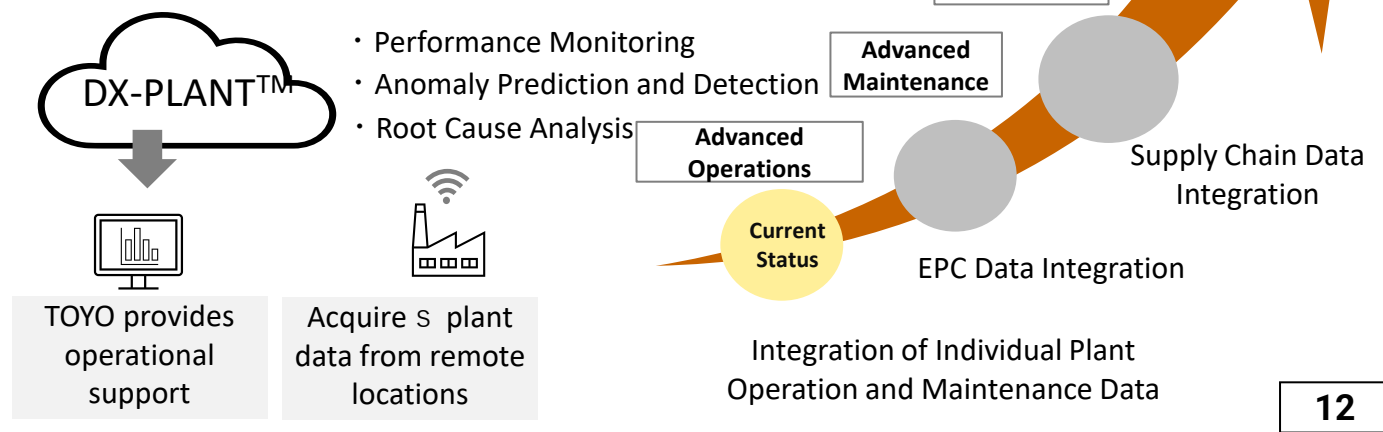
## Value Multiplication Through the Integration of EPC and O&M Data

With DX-PLANT™, we enable real-time performance monitoring and anomaly detection, enhancing plant performance. By offering services that support the entire life cycle, we establish long-term partnerships with our customers.



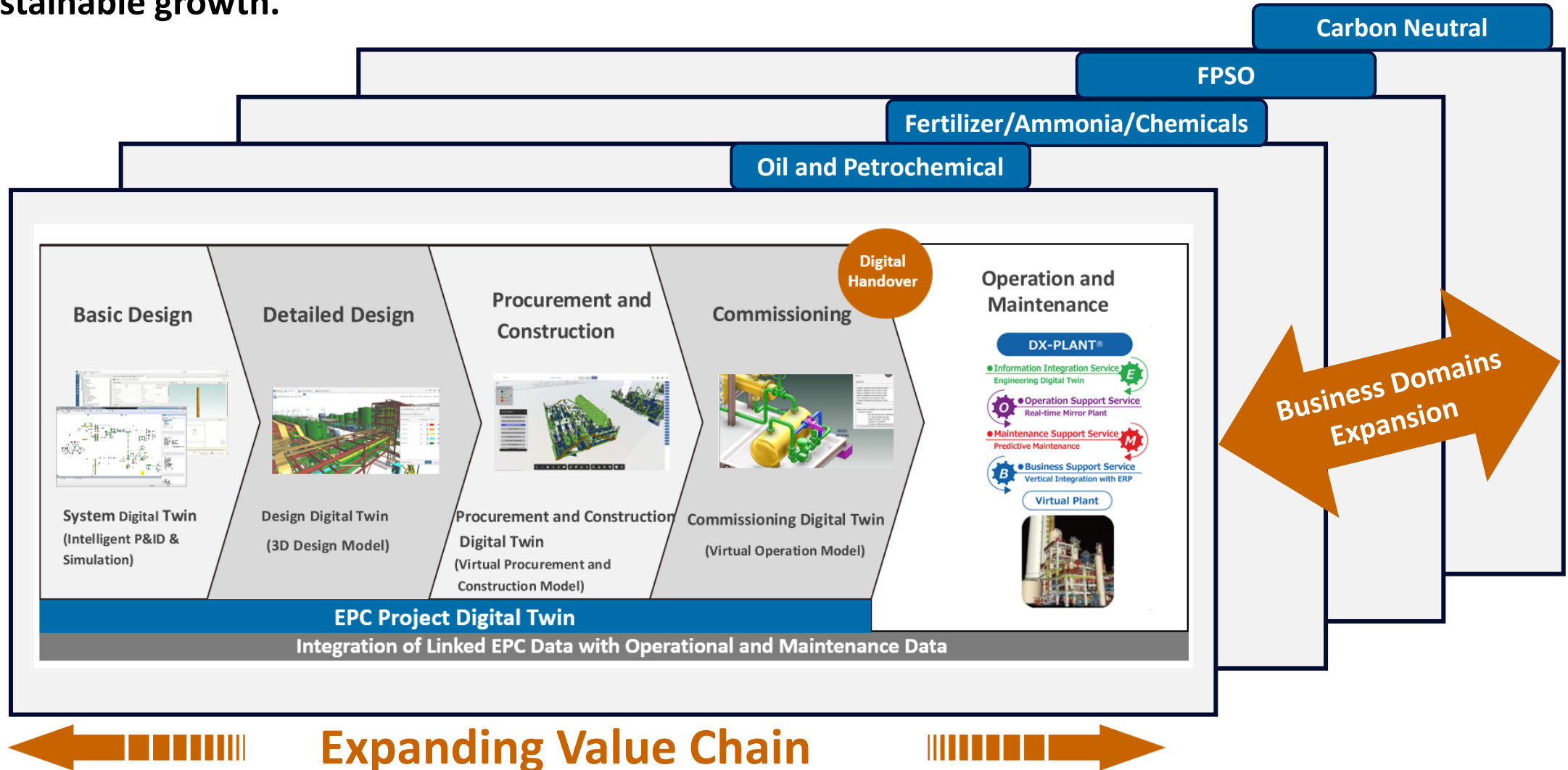
Licensor Expertise × Digital Solutions

### Introduction of DX-PLANT™ to the Bolivian State-Owned Oil and Gas Company



## Expanding Business Domains Leveraging DX Application

By applying DX, we are building a high-value-added model that integrates human resources and digital technologies. This enables entry into new markets and diversification of our portfolio, driving sustainable growth.



## Business Portfolio Management Using Digital Twin for Management

For a diversifying business portfolio, we developed a Corporate Management Cockpit (CMC) which enables agile, data-driven planning optimization, enhancing profitability, risk management, and investment efficiency.

Up-to-Date Sales Data



$2^{300} \approx 10^{90}$   
Patterns

Combination Patterns of  
300 Project Cases

Automated Generation of High-Productivity and Strategic Project Lists



KPI Simulation for Project Selection (Forecasting Outcomes)



DX Investment Recovery and Impact Maximization Analysis



Planning Feasibility Evaluation (Resource Sufficiency Assessment)



## Example of Using CMC Data: Optimizing Execution Plans for Strategic Options

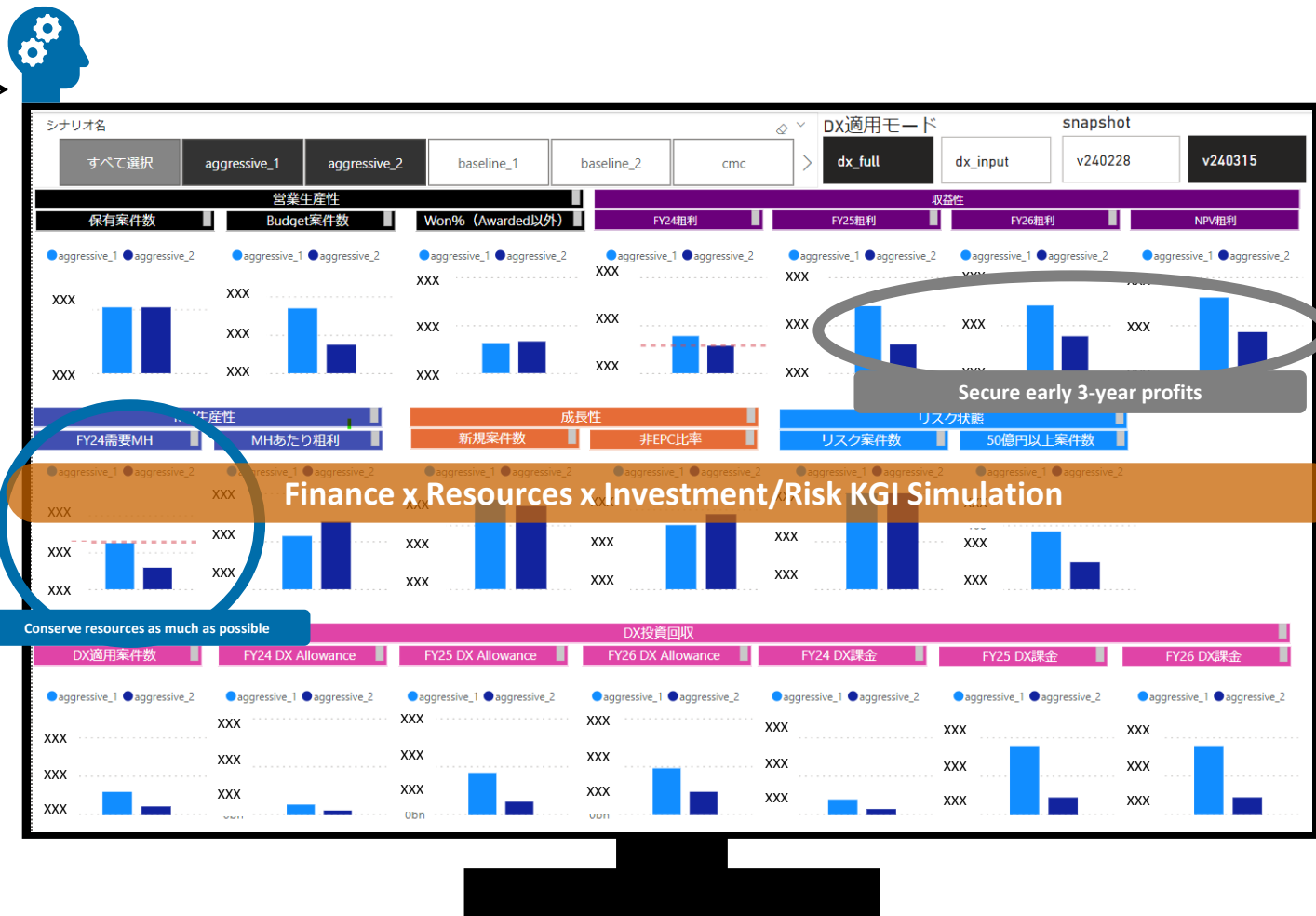
We have created a system to optimize execution plans for each strategic option based on different policies, while simulating and comparing KGI and KPI. (Exploring optimal execution plans backward from KGI and KPI).

**Option 1**  
Growth-Oriented for New Areas

An option focused on reducing resource allocation to core businesses after meeting the profit target for the current year, prioritizing the exploration of new areas.

**Option 2**  
Profit-Focused

An option focused on investing resources in core businesses to secure profit plans for the next year and the year after, with a degree of certainty established within the current year. (Resources are locked for multiple years.)



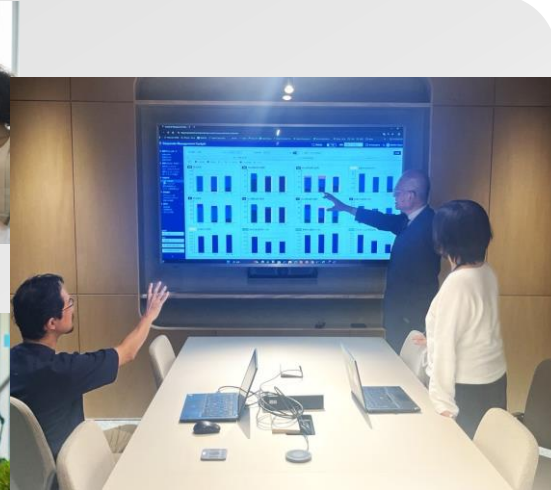
\* Evaluating Combinations of Businesses and Projects for Resource Allocation(An astronomical number of combination patterns exists.)

## Leadership and People

Creating highly reliable customer value through cross-functional expertise and strengthened global governance. Project execution capability (practicality) and organizational support (management) complement each other to generate dual driving forces.

### Strengthening Support Through a Globally Selected Team

### Business Portfolio Transformation and Global Governance



**World No. 1**  
Alteryx  
Global Winner Selection

HEXAGON  
APAC Innovator  
Award

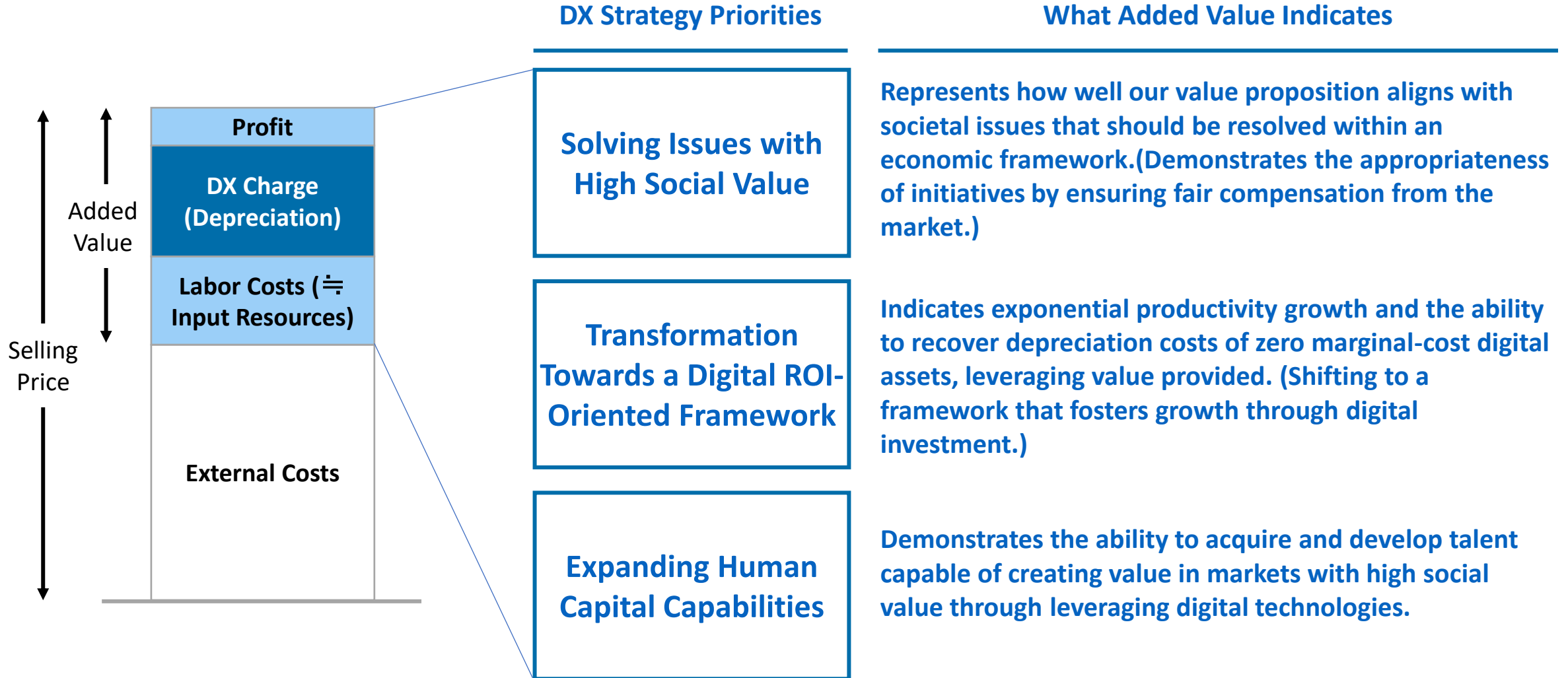
AVEVA  
AVEVA World  
Special lecture





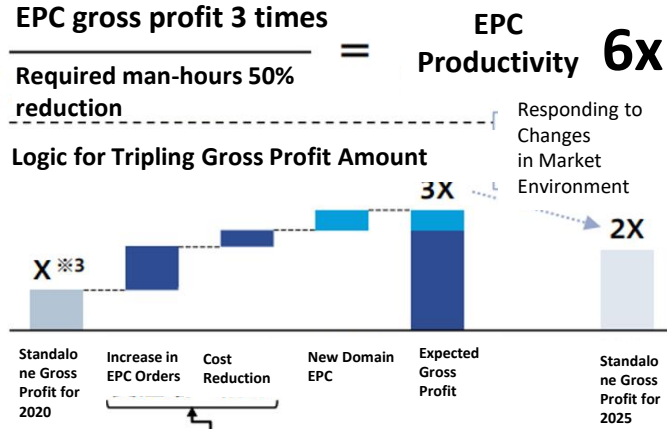
## Value-Added Model of "People + DX Assets" Leverage

A value-added model that leverages DX assets to unlock the potential of our people and enhance value creation. By going beyond existing business domains, it aims to seize new growth opportunities and strengthen sustainable competitive advantages.

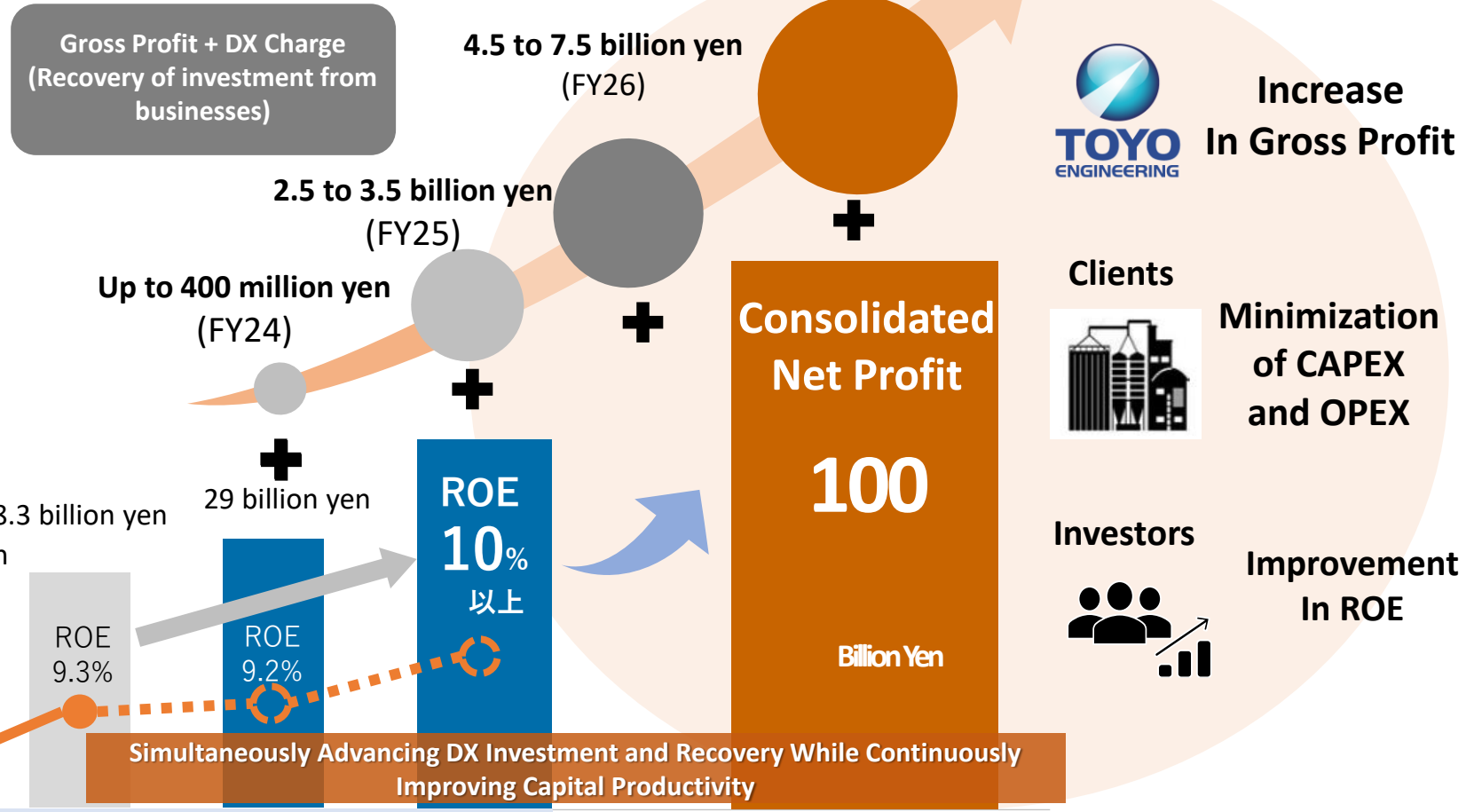
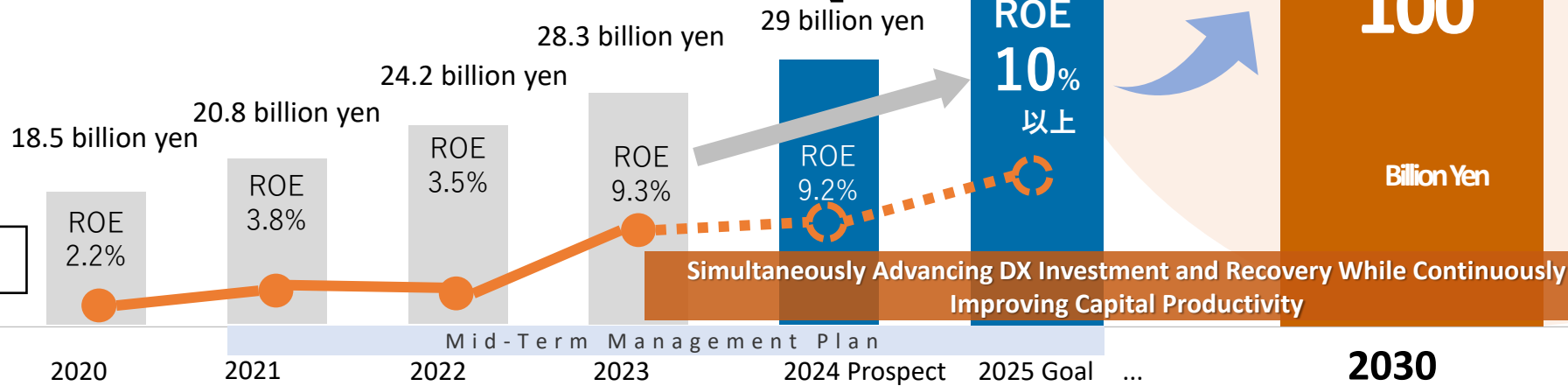


## Reaping the Benefits of DX

Since FY2022, DX application has achieved tangible improvements in quality and productivity. From FY2023 onwards, further expansion in project application and outcomes is expected, aiming to achieve the Mid-Term Management Plan targets.



\*Excerpt from the mid-term management plan



• Considering the potential contributions of DX Application per project to improving Order Gross Profit and reducing resource demand (The expected values are based on the following assumptions as of the end of March 2026 : DX development progress at 50%, applicability to proposal projects at 75%, and harvesting rate at 50%.)



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