Technological Development

The Taisei Group has identified "Promoting the technical development to solve environmental and social issues through open innovation" as a key initiative in its Medium-Term Business Plan (2021–2023). As part of its strategic priorities, the Group is strategically allocating resources to "technological development that contributes to industries anticipated to grow from a harmonious balance between the economy and the environment" and "technological development that offers a competitive edge."

DX

1. Vision (How We Want to Be in 2030):

By 2030, we aspire to realize high-quality and efficient construction by bolstering and broadening our internal and external ties. Furthermore, we aim to manifest new value that positively impacts society at large, such as managing smart city projects on both city and urban scales.

illustration by Hideki Tanaka
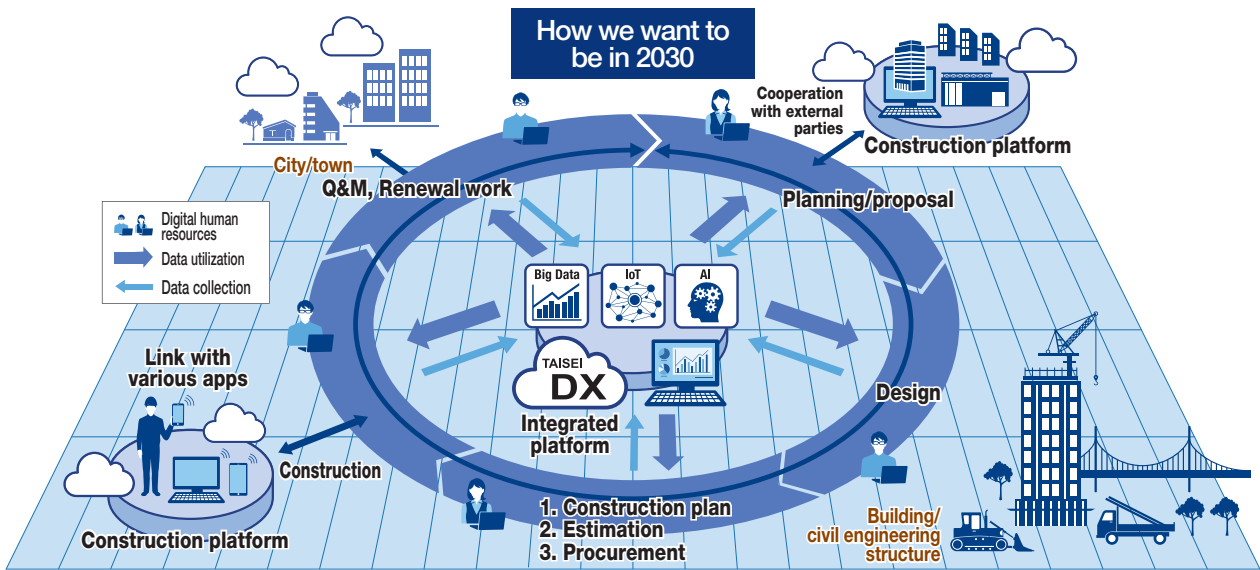
The Taisei Group's DX endeavors to enhance corporate value and make a societal contribution by addressing the challenges faced by society, clients, and employees.
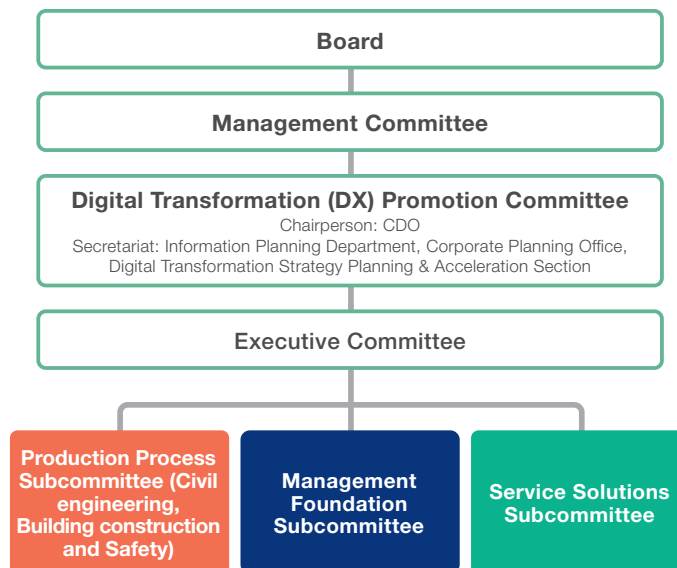
Social	Clients	Employees
Achieving sustainable and optimal cities and buildings, considering various aspects such as the natural environment and lifestyles.	Offering consistent support to ensure the safety and security of buildings and civil structures.	Providing an attractive work environment where diverse talents can thrive in "manufacturing" roles.
✓ Implementation of **environmentally friendly construction** and operations management.	✓ **Delivering extensive value** to building owners, tenants, and users even post-handover.	✓ Utilizing **"remote inspections"** to support on-site QCDSE (Quality, Cost, Delivery Time, Safety, and Environment).
✓ **Collaborating with local governments** to address sustainability challenges and develop new projects.	✓ **Establishing a continuous sales and support framework** that maintains a connection with clients.	✓ **Enhancing management efficiency by centralizing information** across the head offices, branches, and worksites through an integrated platform.

2. Promotion Structure

In 2020, the Taisei Group established its Digital Transformation (DX) Policy and DX Strategy in line with the Ministry of Economy, Trade and Industry's Digital Governance Code. It then set up the cross-functional "Digital Transformation (DX) Promotion Committee" and took a pioneering step in the construction industry by appointing a Chief Digital Officer (CDO).

The Digital Transformation (DX) Promotion Committee is responsible for developing and planning DX promotion measures and monitoring their execution. Subcommittees under the committee, composed of IT managers from various departments and external experts, work on addressing challenges.

From FY2022 onwards, the "Digital Transformation Strategy Planning & Acceleration Section" was inaugurated within the Corporate Planning Office to enhance the promotional framework. This step was aimed at bolstering the acceleration and monitoring of various DX initiatives, facilitating collaboration across departments, and amplifying support for the CDO.
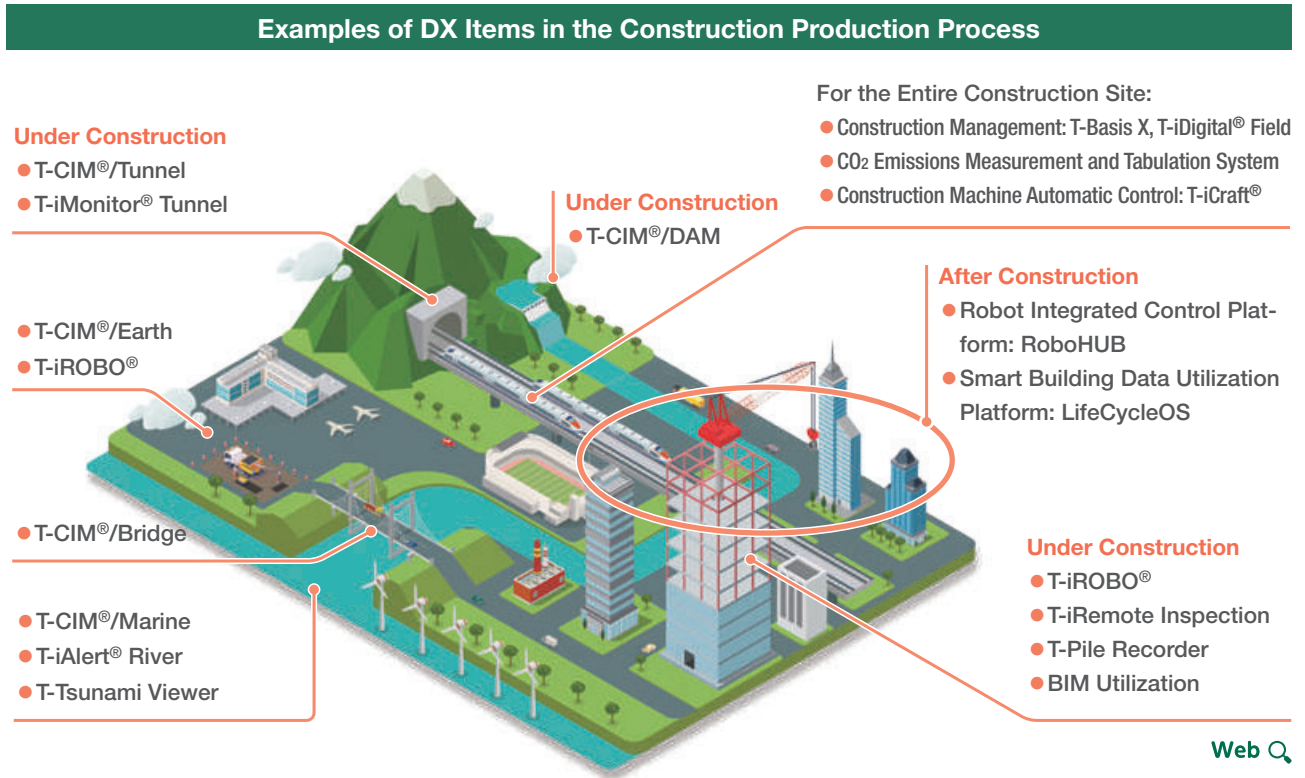
Board

Management Committee

Digital Transformation (DX) Promotion Committee
Chairperson: CDO
Secretariat: Information Planning Department, Corporate Planning Office, Digital Transformation Strategy Planning & Acceleration Section

Executive Committee

| Production Process Subcommittee (Civil engineering, Building construction and Safety) | Management Foundation Subcommittee | Service Solutions Subcommittee |

3. Initiatives and Progress

Key Initiative: Realize a transformation in the production system and work style through DX

	Core DX-Related Initiatives	Progress
DX in Production Process	1 Building digital twins via BIM/CIM design and construction cloud integration. 2 Enhancement of the procurement-related information system. 3 Streamlining and making the production processes transparent using advanced digital technologies.	Incremental roll-out of digital solutions to enhance productivity, safety (with methods for efficiency and manpower reduction), and quality. ● Also pushing forward initiatives like monitoring CO_2 emissions.
DX in Management Foundation	4 Establishment of an integrated platform. 5 Securing digital talents and introducing a rotation system.	Progression in sophisticated management and business operations using data, facilitated by an "integrated platform" system that allows various departments and worksites to extract and utilize data as required. ● Launched the integrated platform, allowing effective use of data stored across different in-house systems. ● Accelerating data usage in managerial decision-making processes with the deployment of business intelligence tools tailored for managerial metrics overview. ● Full-scale roll-out of DX Academia: Initiated digital literacy training tailored for experts skilled in both digital realms and the DX operations of each division. Plans to introduce training for all employees are also in the pipeline. ● Proposals to introduce digital mechanisms that bolster autonomous learning are also on the table.
DX in Services & Solutions	6 Monetizing the O&M domain. 7 Transitioning to a sales approach based on timely proposals, informed by data analytics.	Launching the digital facility management (DFM) initiative, embodying the concept of a "go-to doctor for buildings," offering continued support through the building's life cycle. ● Developed "LifecycleOS," a platform optimized for data utilization in smart buildings. ● Continual development, execution, and maintenance of digital service solutions tailored to cater to the diverse needs of all stakeholders in the building domain.

4. Details of the Initiative

Examples of DX Items in the Construction Production Process

Under Construction
- T-CIM®/Tunnel
- T-iMonitor® Tunnel

Under Construction
- T-CIM®/DAM

For the Entire Construction Site:
- Construction Management: T-Basis X, T-iDigital® Field
- CO_2 Emissions Measurement and Tabulation System
- Construction Machine Automatic Control: T-iCraft®

- T-CIM®/Earth
- T-iROBO®

After Construction
- Robot Integrated Control Platform: RoboHUB
- Smart Building Data Utilization Platform: LifeCycleOS

- T-CIM®/Bridge

Under Construction
- T-iROBO®
- T-iRemote Inspection
- T-Pile Recorder
- BIM Utilization

- T-CIM®/Marine
- T-iAlert® River
- T-Tsunami Viewer

Web 🔍

Building Construction

DX in Production Process

The T-BasisX is a DX standard platform integrating the Wi-Fi environment with AI & IoT. It seeks to transform production processes by enhancing collaborations with various DX systems.

Data collection and analysis from the commencement of construction to its completion within the site have been made easier, with the deployment of remote-controlled robots.

Collaboration with systems like the T-iRemote Inspection is expected to further optimize construction progress and enhance management efficiency.
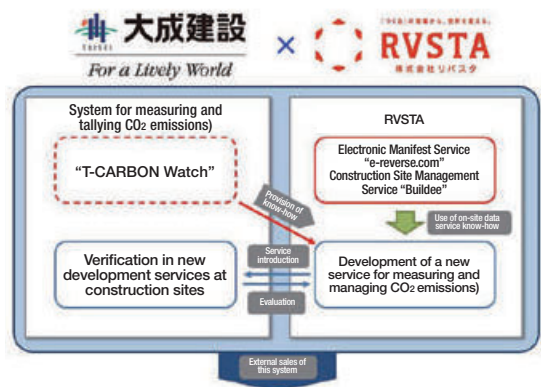

Value Proposition

✓ Effortless and comprehensive deployment of internet infrastructure, fundamental for digital technology applications in the field.

✓ Operational automation and labor saving on-site via real-time data collection sensor and robot deployment.

Web 🔍

Initiated the development of a CO_2 emission measurement and management service for construction sites, aiming for widespread adoption in the construction industry.

A dedicated CO_2 emission measurement and collection system has been developed for construction sites. Leveraging image recognition and other technologies, this system automates the tracking of CO_2 emissions. Moving forward, our objective is to minimize user inconvenience, ensuring the system is user-friendly and aiming for its widespread adoption within the construction industry.

Value Proposition

✓ Significantly reduces manual data entry by automating the capture of various metrics like construction machinery and vehicle numbers, fuel consumption, etc.

Web 🔍

Civil Engineering

DX in Production Process

Ensure quality and enhance productivity and safety with applications that feature the T-iDigital® Field, a worksite management system that utilizes data.

As a platform for civil engineering DX, it's deployed in approximately 30 different construction projects.


Value Proposition

✓ Assist in the quality, cost, delivery time, safety, and environment (QCDSE) management of construction, enhancing productivity and safety while contributing to CO_2 reduction.

✓ By collecting and formalizing data from various types of construction, we aim to preserve technical expertise and further the automation of construction management and processes through AI.

Web 🔍

T-iCraft®: A Coordinated Control System for Construction Machinery. Introduced at dam construction sites, it emphasizes the expansion of unmanned and labor-saving operations.

The T-iCraft system controls the coordinated operation of various types and models of construction machinery, integrating different control systems and multiple units of autonomous construction equipment. By coordinating operations with the T-iROBO series of construction machinery, a notable enhancement in productivity has been achieved. In 2022, it was utilized during the construction of the Namma Dam's primary structure.
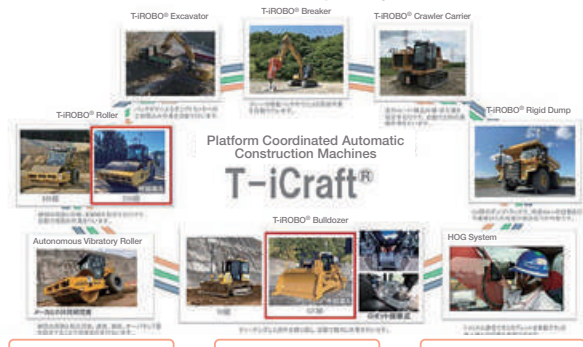
- Controls the coordinated operation of various types of automatic construction machines.
- Achieving PF with a high degree of freedom in applicable construction equipment.
- The HOG system can be used to coordinate with manned construction equipment.

Value Proposition

✓ Boosting productivity and quality via the collaborative efforts of humans, construction machinery, and robots.

✓ Amplifying on-site safety through unmanned construction methodologies

Web 🔍

DX in the Service Solution

LifeCycleOS: A data utilization platform for smart buildings. Supporting the transition to advanced facility management grounded in data.

LifeCycleOS aggregates data from facilities, users, energy, and more, enabling data utilization and analysis. As of July 2023, the system is implemented at Taisei Advanced Center of Technology, Kansai Branch, Yokohama Branch, and Kawagoe Factory of Taisei U-LEC Co., Ltd. In conjunction with solution services tailored for each application, we aim to deliver digital facility management "DFM" that aspires to be an "ever-evolving smart building."

Building data platform as a basis for building data

① Flexibly and **easily connectable**

② **Sustainably evolving**

③ Human-centric and **user-friendly**
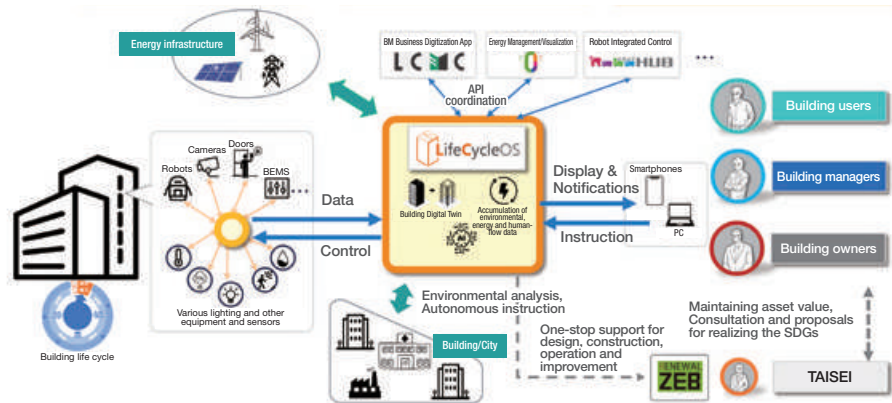
Value Proposition

✓ Delivering diverse value to all stakeholders during the facility's operational phase:
- For clients: Enhancing facility asset value
- For managers: Cutting down on maintenance expenses and energy usage, aiding in the transition to carbon neutrality
- For users: Ensuring safety and comfort, boosting convenience

Web 🔍