RIB 4.0 Implementation in Railway Project

China Railway Engineering Design and Consulting Group Co., Ltd. (hereinafter called CREDC), was founded in February 1953. CREDC is a large comprehensive survey and design group specializing in project planning, engineering survey, design, consultancy, construction supervision, EPC contracting, technology and railway related products research and development. CREDC is the key subsidiary of the Fortune Global 500 listed enterprise China Railway Group Limited (a.k.a. China Railway Engineering Corporation, CREC) with a registered capital of RMB 730 million.

Headquarter
Beijing, China

Industry
Engineering Design and Consulting

Products & Services
Infrastructure of railway, urban rail transit system, highway and motorway, municipal, building, mining & metallurgy

Website
http://www.cec-cn.com.cn/

Challenge

Railway construction in China faces the common challenges of the construction industry: low level of digitalization, low efficiency in project management and construction, and lack of qualified workers. At the same time, it has its own problems, such as difficult collaboration between various interdependent disciplines, short project time frame and high pressure on schedule management, safety and quality management.

Targets

01 Improve quality, reduce risk

02 Reduce cost, shorten project time

03 Increase efficiency, improve management

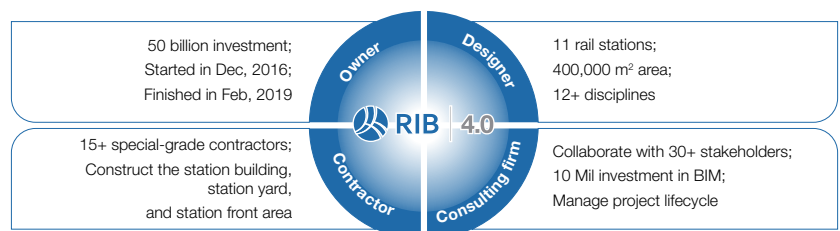**04** Lean construction, sustainable development

Solution

After 9 months of market research and comparison, CREDC selected iTWO in 2016 and later upgraded to the cloud-based RIB 4.0 platform in 2017, to run the company and its projects. With BIM and Cloud technology as the engine, RIB 4.0 help CREDC realize project lifecycle management in one integrated system and increase management efficiency dramatically.
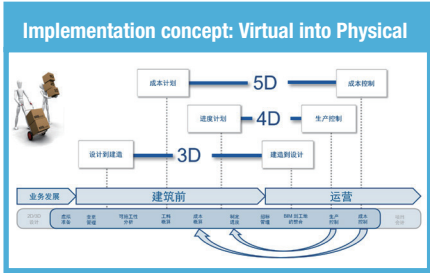
RIB 4.0 Project

Jiqing High-speed Rail

- Jinan-Qingdao High-speed Rail (Jiqing High-speed Rail) is located in Shandong Province and is the first high-speed rail invested by local government with total investment of 59.983 billion RMB. It's an important part of China's "four vertical and four horizontal" express railway network.

- Jiqing High-speed Rail station implemented BIM technology in project schedule management and cost control, which helps to increase construction productivity and ensure delivery within schedule.
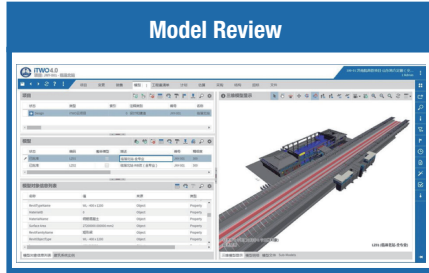
Owner
50 billion investment;
Started in Dec, 2016;
Finished in Feb, 2019

Designer
11 rail stations;
400,000 m² area;
12+ disciplines

Contractor
15+ special-grade contractors;
Construct the station building, station yard, and station front area

Consulting firm
Collaborate with 30+ stakeholders;
10 Mil investment in BIM;
Manage project lifecycle

RIB 4.0

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Implementation Highlights

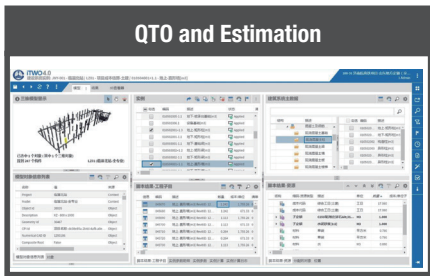**Implementation concept: Virtual into Physical**

RIB 4.0 enables CREDC to build their projects virtually end to end before it's built physically, to identify and reduce risks in the early stage and increase productivity through the entire project lifecycle.
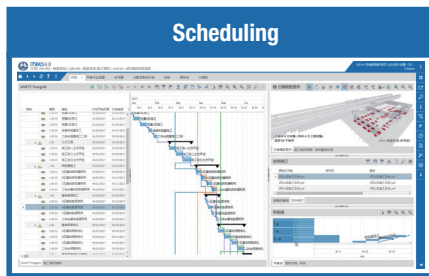

Model Review

CREDC used Revit for modelling and exported the BIM models to RIB 4.0 for model review, which help to verify the model quality for the following QTO, estimation and project control processes.
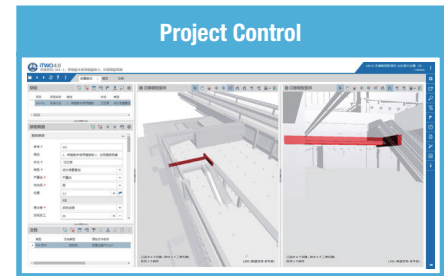

Mobility

The control tower of RIB 4.0 can be accessed by various mobile devices, which facilitates real-time decision making.

QTO and Estimation

To reduce repetitive quantity take off works, the QTO module uses pre-defined logic to complete Quantity Take Off after models imported. The railway rate book and Shang-dong province regional rate book pre-input in RIB 4.0 can help CREDC complete estimate process, which integrate government/local rate book, model and Bill of Quantity.

Scheduling

In the planning phase, CREDC connected BIM models with BoQ and schedules to realize 5D simulation, and optimized the schedules and cost planning according to the simulation result. In the construction phase, CREDC directed contractors to input actual project progress in RIB 4.0 platform on a weekly basic for project execution evaluation. The Gant Chart feature enables comparison between planed progress and actual progress to facilitate decision making.

Project Control

In terms of quality and safety control, iTWO 4.0 can go deep into object level. While change management is an important step for cost control in construction phase for the owner, RIB 4.0 enables the comparison between original models and the changed models, making changed information clear at a glance. The changed information is traceable in a workflow, which provides evidence for the cost increased.

Implementation Outcomes

With the implementation of RIB 4.0 in construction phase, CREDC has optimized construction schedule, improved cost control and enhanced quality and safety control.

Save analysis time by
20%

Reduce change orders by
30%

Shorten project duration by
5%

Reduce project cost by
5%

RIB 4.0 is an enterprise management platform, which can realize multi-project management. Its strength in project collaboration, integration with ERP and PM system, and database configuration meet the business need of our company. RIB shares the same vision with CREDC, we are willing to be running together with RIB to digitalize the railway industry with BIM technologies.

— **Wang Xiaogang**
General Manager of Information Division
China Railway Engineering Consulting Group Co., Ltd.