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建造創新博覽會 Construction Innovation Expo 2019

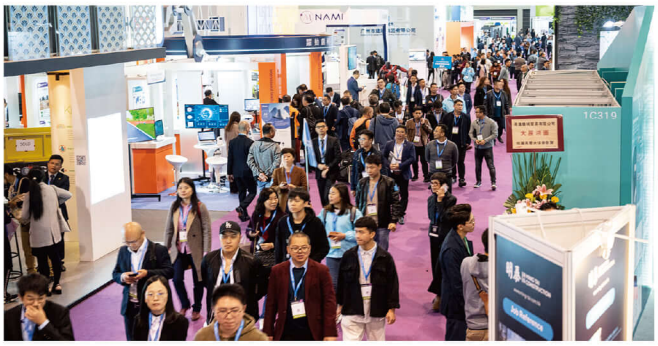
2019建造創新博覽會(創博會)於2019年12月17至20日在香港會議展覽中心舉行，吸引15個國家及地區合共228個參展商參加，參觀人數超過23 500人。建造業這一盛事由發展局及建造業議會(議會)合辦，並由中華人民共和國國家住房和城鄉建設部科技與產業化發展中心協辦。

香港特別行政區行政長官林鄭月娥在發展局局長黃偉綸、國家住房和城鄉建設部副部長易軍，以及議會主席陳家駒陪同下主持開幕典禮。她致辭時表示，香港的基建發展極具優勢，舉辦創博會理想不過。她說：「創新及科技是大灣區發展重要的一環，我們看見香港具潛力在這方面擔當重要角色。」

為表示對創博會的大力支持，黃偉綸局長除了出席開幕典禮外，還於「組裝合成」建築法的國際會議中致歡迎辭。而發展局常任秘書長(工務)林世雄亦在「創建亞洲論壇」中以香港的基建發展為題作演講。

創博會旨在為建造業提供優越的知識分享和業務配對平台，推動業界邁向建造新紀元。此外，創博會不但為超過23 500多名建造業界人士帶來交流機會，還展出最新的創新及科技產品，以及舉辦多個國際會議。

創博會以「建造業2.0」為主題，涵蓋四大範疇，即裝配式建築、建造機器化、建造數碼化和先進技術及材料。創博會展出多種最新的科技產品及物料，有效培養創新文化和促進業界應用新科技。建造業創新及科技基金下的預先批核名單項目供應商及其他機構，亦把握機會展示形形色色的尖端科技產品，包括激光掃描器、自動鋼筋屈曲機、智能安全監控系統、數碼化項目管理工具、拆卸和焊接機械人等。這些科技產品大都能提高本地建造項目的生產力及質素。

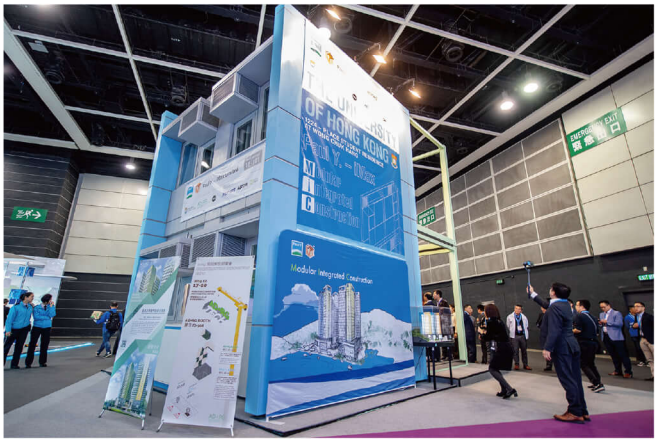


此外，除了產品展覽外，創博會還舉辦了一連三天的國際會議，由超過 40 位本地及海外專家、學者擔任演講嘉賓，主題包括建築信息模擬、組裝合成建築法、裝配式建築、機械人與自動化。議會創新獎頒獎禮亦借此機會舉行。活動中，英國建造業領導議會聯席主席 Andy MITCHELL 先生就英國建造業轉型過程及促成因素作主題演講。國際創新大獎得主新加坡南洋理工大學陳義明教授及本地創新大獎得主有利集團黃天祥工程師也一同分享經驗，分別簡介智能機械人系統和高層混凝土結構組裝合成系統兩個得獎項目。

創博會通過提升創新定位和加強國際交流，不但擦亮了「香港建造」的品牌，更發揮催化作用，促進業界在自動化、工業化及數碼化方面的發展!

特寫CLOSE-UP

The Construction Innovation Expo (CIExpo) 2019, with 228 exhibitors from 15 countries and regions, received over 23 500 visitors during the event on 17-20 December 2019 at the Hong Kong Convention and Exhibition Centre. This signature event of the construction industry was co-hosted by the Development Bureau and the Construction Industry Council, and supported by the Centre of Science and Technology Industrial Development of the Ministry of Housing and Urban-Rural Development of the People's Republic of China.



The Chief Executive of the HKSAR, Mrs Carrie LAM, officiated the grand opening ceremony in the company of the Secretary for Development, Mr Michael WONG, the Vice Minister of the Ministry of Housing and Urban-Rural Development, Mr YI Jun, and the Chairman of the CIC, Mr. CHAN Ka-kui. In her opening address, Mrs LAM commented that the strengths Hong Kong possessed in infrastructure development made the city an ideal place for holding the CIExpo 2019. "Innovation and technology are an important part of the Greater Bay Area development. We see the potential of Hong Kong in playing a key role in this aspect" she said.

To express strong support for the CIExpo, Mr Michael WONG not only attended the grand opening ceremony but also delivered a welcoming remark in the international conference on "Modular Integrated Construction (MiC)". The Permanent Secretary for Development (Works), Mr LAM Sai-hung, also gave a presentation on the infrastructure development in Hong Kong at the "Building Asia Forum".

CIExpo 2019 aimed to provide the construction industry with an excellent knowledge sharing and business matching platform with the vision to enter into a new construction era. Not only did the CIExpo 2019 bring about networking opportunities for more than 23 500 participants across different disciplines of the industry, but also featured exhibition of latest innovations and technologies as well as international conferences.

Centred around the theme of "Construction 2.0", the CIExpo 2019 embraced four key areas, namely Offsite Construction, Robotics and Automation, Digital Solutions, and Advanced Technologies and Materials. The exhibition covering products and materials of many latest technologies effectively nurtured an innovation culture and promoted technology adoption in the construction industry. Suppliers of the pre-approved list items under the Construction Innovation and Technology Fund and other organisations seized the chance to showcase a variety of products of cutting-edge technologies, including laser scanner, automatic bar bending machine, intelligent safety monitoring system, digital project management tool, demolition and welding robots and the like. Most of these technologies would benefit local construction projects in terms of productivity and quality.

In tandem with the exhibition was a 3-day international conference covering a wide range of topics delivered by over 40 local and overseas experts and academics. Examples of topics were : Building Information Modelling, MiC, Design for Manufacture and Assembly and Robotics and Automation. Also on stage was the CIC Construction Innovation Award Presentation Ceremony. The Council Co-chair of Construction Leadership Council UK, Mr Andy MITCHELL delivered a keynote speech on the transformation journey and the enablers of the UK construction industry. Winner of the International Grand Prize, Professor CHENG I-Ming from Nanyang Technological University, Singapore and the Local Grand Prize awardee Ir Conrad WONG from Yau Lee Group also shared their award winning projects, viz. Intelligent Robotic Systems and High Rise Concrete MiC System.

By strengthening innovative identity and international relations, the CIExpo 2019 not only helped shine up the brand of "build in Hong Kong", but also catalysed automation, industrialisation and digitisation in our industry!

「建造業創新及科技基金」申請數字節節上升

CITF application figure is rising

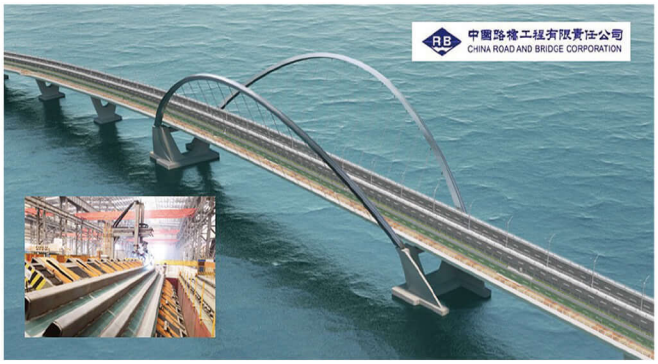
由2018年10月至今已收到逾一千四百份申請 ，當中一千多份申請已經成功獲批，總資助額逾港幣二億一千八百萬元。

Counting from October 2018, the application number has reached more than 1 400, of which over 1 000 applications have been approved. The funding grant amounts to more than HK$218 million.

與 CITF 對話
CHATS

跨地管理數碼化
Digitisation of Cross-Site Management

中國路橋一直走在智慧建築的前端，通過創新及先進科技，包括建築信息模擬、人工智能系統及預製組件建築法等，把工程項目的效率及生產力提升至更高水平。為了進一步實踐智慧建築的理念，我們一直從不同渠道物色合適的產品。現在有了建造業創新及科技基金(基金)的預先批核名單，我們省卻了不少搜尋資料的工夫。在基金的撥款支持下，我們購入Spatial Technology設計的"Novade**工程監督數碼管理系統**"(預先批核的產品之一)，並應用於**將軍澳跨灣連接路項目(NE/2017/07)**，用作管理預製組件在內地由生產、裝配、運送以至在香港安裝的整個流程。



將軍澳跨灣連接路 Tseung Kwan O Cross Bay Link

收集大數據 提升工地運作管理能力

將軍澳跨灣連接路的主要結構由84個預製組件組成，涉及超過2 600個部件。Novade 讓我們的工程團隊有效地收集和監控龐大的信息數據。團隊不論在何處，也可隨時追踪質量監控、執修工作及工程進度報告。此外，工地主管亦可通過主控台進行切合需要的數據分析，並隨時隨地下載實時進度報告撮要，大大提升團隊的項目管理能力 。

信息共享 突破時間地域限制

Novade 可讓所有工程數據及分析通過雲端實時同步。先進的數據及圖片壓縮技術令信息傳送更快捷可靠。即使身處的環境 Wi-Fi 訊號接收不佳，亦可使用離線模式，以確保操作無間斷。中港兩地的持分者都可通過電腦或流動裝置隨時隨地分享實時數據，加強兩地協作，讓跨地域監控管理更為奏效。

信息安全 全面監督

Novade 可確保工程數據安全、機密、完整，及可監控。這個監督系統集中收集、處理和分享所有工程項目的數據。數據一經提交和記錄，便不得隨意編輯。系統會自動保留審核記錄和日誌，確保數據易於追溯。

實現環保、無紙化及自動化

Novade 平台亦能協助我們在建築工地進一步實踐環保概念，推動無紙化工序，由填寫檢測表格、提交至審批，整個流程均可線上處理。

總體而言，採用數碼化工程監督系統有助促進生產力和提升效率，以及提早完成工程項目。中國路橋將繼續擁抱創新及先進科技，加速發展智慧建築。

中國路橋工程有限責任公司

China Road and Bridge Corporation (CRBC) has been at the forefront of smart construction. Through the application of innovation and advanced technology, including Building Information Modelling (BIM), artificial intelligence systems, and prefabrication construction methods, CRBC has escalated the efficiency and productivity of our projects to another level. We have engaged multiple channels to look for suitable products to further implement the concept of smart construction. The pre-approved list of the Construction Innovation and Technology Fund (CITF) saves us much effort on data research. Under the CITF's funding support, CRBC has adopted Spatial Technology's **"Novade Digital Site Supervision System"**, one of the pre-approved solutions, in the **Tseung Kwan O Cross Bay Link Project (NE/2017/07)**. It was applied to manage the whole process from production and assembly in the Mainland to transportation and finally installation in Hong Kong.

Big Data Collection to Enhance Site Operation Management

The main structure of Tseung Kwan O Cross Bay Link comprises 84 prefabricated segments, which involves some 2 600 components. With Novade, our engineering team can effectively capture and monitor such large amount of data. Instant tracking can also be done on quality inspection, defects rectification and project progress update regardless of when and where our teams are. Moreover, site managers can retrieve information from customised data analysis through dashboards and download the real-time progress summary report anytime anywhere, thus enhancing our project management capabilities.

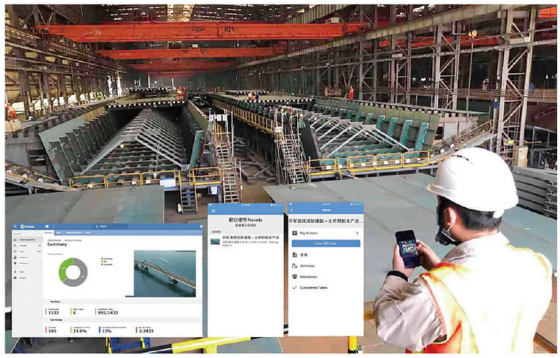
Collaborative Information Sharing, No Matter When or Where

Through Novade, all project data and analysis are synchronised real time with the cloud. Advanced data and picture compression technology makes information transmission faster and more reliable. Even in an environment with poor Wi-Fi signals, offline mode is available to ensure uninterrupted operation. Stakeholders in both Hong Kong and the Mainland can share real-time data anytime via computers or mobile devices, thus enhancing collaboration between the two places and achieving more effective cross-region monitoring and management.

Data Security, Flawless Supervision

Novade assures us of data security, confidentiality, integrity and monitoring. All project data is collected, processed and communicated in this centralised supervision system. Once the data is submitted and recorded, it cannot be altered. The system will automatically keep audited records and system logs to ensure data traceability.

Go Green, Paperless and Automation



Novade工程監督數碼管理系統跨地使用
Cross-site Management by Novade Digital Site Supervision System

Novade helps CRBC further realise the vision of "Go Green" in construction sites – paperless workflow for inspection form drafting, submission and approval via online portal.

To conclude, digitising on-site supervision helps boost productivity, improve efficiency and advance project delivery. CRBC will continue to embrace innovation and advanced technology so as to accelerate the development of smart construction.

China Road and Bridge Corporation

運籌帷幄之中 決勝千里之外
Managing your construction projects with a crystal ball

建造業的數碼分身

數碼分身是建造業目前最重要的科技之一。世界著名的科技顧問公司 Gartner 曾連續三年把數碼分身選為重要策略科技趨勢之一，足證這項技術的重要性。

數碼分身是以數碼技術複製建築工地的運作，為工程團隊提供一種可視化工具，能以三維模式察看和了解工地的實時情況，有助促進各方之間的協調。

新一代數碼項目管理系統

Varadise Twin 是以最新數碼分身技術打造而成的新一代數碼項目管理系統。這個建築信息模擬平台會不斷更新工地的實時數據，讓工地監督人員更容易進行項目管理。

Varadise Twin 與 Autodesk-BIM360 或 Bentley-Projectwise 連結後，可在一個中央平台同步更新建築信息模擬數據作數碼項目管理，讓工程團隊可管理：

1. 「檢查及測量申請表格」的提交及批核情況
2. 工地檢測記錄
3. 安全審查記錄及跟進事項
4. S-Curve進度監察及4D 施工記錄
5. 工人出勤記錄
6. IoT機器及設備運作記錄及檢查
7. MiC實時物料運送及安裝記錄

以及更多其他數碼應用以支援數碼項目管理。

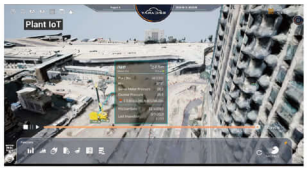
建造業2.0

Varadise Twin 作為新一代數碼工程監督系統，能讓工程主管利用數碼方式管理建築工程，通過建築數碼化提升工地的生產力及質量。

呂樂倫工程師在領導業務轉型和推動建築工程數碼化方面經驗豐富。他表示：「在施工管理方面有很多隱藏成本，例如因溝通不足而閒置機械或浪費物料、施工質素差劣而引致工程延誤，以及數以千計用於撰寫報告的工作日數。這些全都可以通過更佳的信息管理解決問題。」

Varadise 人工智能引擎可分析建築信息模擬和工程數據，以測出延誤、施工質素問題或其他相關錯漏。所有問題均會通過建築信息模擬反映出來，並可利用桌面及流動裝置獲取資料。相關人員亦會通過流動裝置收到實時通知。

Varadise Twin 會記錄工地所有活動，並能自動編製項目報告。事實證明，Varadise Twin 可減少 **50% 撰寫報告**和 **60% 搜尋記錄的時間**。該系統提供全面的透明度和可追溯性，有助工程團隊更有效地推動智慧建築。



通過最新的建築信息模擬和數碼分身技術，Varadise Twin 能推動建造業2.0的發展。Varadise Twin 已納入建造業創新及科技基金 (基金) 的預先批核名單。現在就向基金申請資助，建立你的數碼分身模型。

Digital Twin for Construction

Digital twin is emerging as one of the most important technologies for the construction sector. Gartner, a world-renowned technology consulting firm, has selected digital twin as one of the top strategic technology trends for 3 consecutive years, which further assured its prominence.

Digital twin is about building a digital replica of a construction site's operation. By providing a visual tool for project teams to see and understand real-time site situation in 3D, digital twin helps facilitate effective coordination among different parties.

Next generation Digital Project Management Hub

Varadise Twin is built upon the latest digital twin technology, serving as next generation Digital Project Management Hub. It is a live Building Information Modelling (BIM) platform constantly undergoing real-time site updates to make project management easier for site supervisory staff.

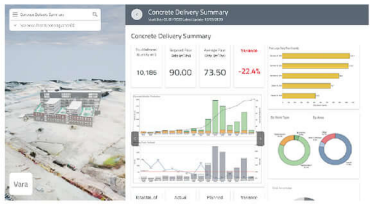
By connecting with Autodesk-BIM360 or Bentley-Projectwise, Varadise Twin synchronizes the latest BIM data for digital project management in a centralised platform, with which project teams can then manage :

1. "Request for Inspection and Survey Checking Forms" submission and approval status
2. Site inspection and checklists
3. Safety observation and follow up actions
4. Site progress monitoring with S-Curve, and 4D works records
5. Labour attendance records
6. Plant and equipment utilisation with IoT
7. MiC delivery and installation tracking

and many other digital applications to support digital project management.

Construction 2.0

Varadise Twin serves as next generation Digital Works Supervision System (DWSS). It allows project leaders to manage construction works digitally, improving productivity and enhancing quality through construction digitisation.



Terence Lui, who has profound experience in leading business transformation and implementing construction digitisation, remarked "There are a lot of hidden costs in construction management, e.g. idling and wastage caused by miscommunication, delay out of poor workmanship, and thousands of man-days spent on report preparation. All these can be spared with better information management".

With Varadise AI engine, it analyses BIM and construction data to detect delays, workmanship issues or other related defects. All problems will be highlighted in BIM, and accessible on both desktop and mobile device. Relevant personnel will receive real-time alert through their mobile device.

As Varadise Twin keeps a full record of everything happened on site, project reports can be automatically generated. It has been proven that Varadise Twin can reduce **50% report preparation time** and **60% record searching time**. It provides full transparency and traceability, helping the project teams to get smart construction better achieved.

With latest BIM and digital twin technology, Varadise Twin supports Construction 2.0. Varadise Twin has been admitted to the pre-approved list of the Construction Innovation and Technology Fund (CITF). Apply now to CITF to start building your twin model.

Varadise Limited